THE CITY OF ARLINGTON, TEXAS

HIKE AND BIKE SYSTEM MASTER PLAN

EXECUTIVE SUMMARY

A collaboration between the Community Development and Planning Department and the Parks and Recreation Department

Adopted by City Council on 08-02-2011

Acknowledgements

Key Partners

City of Arlington
Texas Department of Transportation (TxDOT)
North Central Texas Council of Governments (NCTCOG)
Arlington Independent School District
University of Texas at Arlington

Hike and Bike System Master Plan Steering Committee

Deborah Humphreys, NCTCOG
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Gordon Johnston, Bicycles Inc.
Theresa A. Lopez, TxDOT
Bob Murday, River Legacy Foundation
Kendy Saud, Citizen Representative
Christina Sebastian, UT-Arlington - Student
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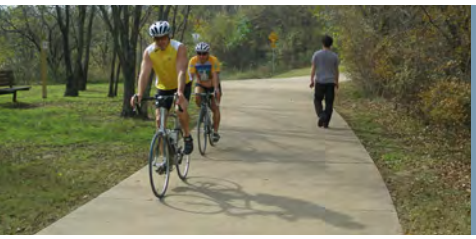
Project Consultants

Greenways Incorporated | PBS&J | The Lentz Group | Henderson Consulting



EXECUTIVE SUMMARY

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Arlington at a Turning Point

The City of Arlington is at a turning point in its history. Arlington has more than 370,000 residents, is the 49th largest city in the United States, and is part of the fourth largest metropolitan area in the United States.[1] It is home to the Entertainment District which includes the Cowboys Stadium, Texas Ranger's Ballpark, Six Flags over Texas, Hurricane Harbor, Arlington Convention Center, and the International Bowling Museum and Hall of Fame. The University of Texas-Arlington is located in Downtown Arlington and has a student population of approximately 33,000. Even with all these attractions and growth, Arlington still faces challenges, such as improving mobility choices and promoting health and wellness.

Planning today is necessary to meet the community's needs of tomorrow. Hike and bike amenities are an especially important part of this planning effort. They are critical if Arlington wants to offer transportation choices, improve safety, enhance community health and wellness, and improve economic competitiveness. The City can overcome its traditional shortfalls related to hiking and bicycling by developing an integrated, safe, and convenient multi-modal transportation system.

This Hike and Bike System Master Plan represents a strong City commitment to:

- ***affordable personal mobility,***
- ***carbon-free transportation, and***
- ***healthy, active lifestyles for Arlington residents.***

The primary goal of this Master Plan is to create an integrated, seamless transportation and recreation framework to facilitate hiking and biking as viable transportation alternatives throughout Arlington. The Plan defines an important connection between public health and the diminishing access to outdoor landscapes and provides action-oriented guidance for the development of an interconnected system of greenways, on-road bicycle amenities, and sidewalks.

The Hike and Bike Plan is a comprehensive action plan that contains the findings of a year-long planning process that included input from area residents, City staff, a project Steering Committee, and community groups.

1. 2009 Population Estimates. United States Census Bureau, Population Division. 2010-06-22.

The Process

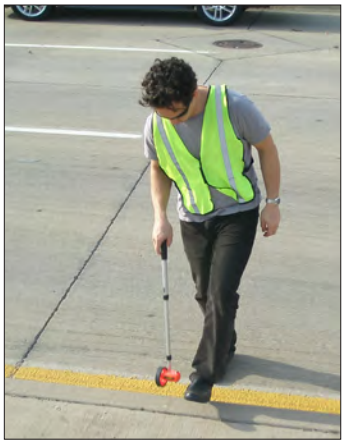
In November 2009, the City of Arlington began this planning effort with a kick-off meeting for the Steering Committee and public. The Steering Committee was composed of City staff, key stakeholders, and active citizens. Multiple committee meetings occurred during the planning process with members providing input on project goals, visions, facility needs, priorities, and the Draft Plan.

The winter of 2009-2010 was dedicated to field research, the analysis of GIS data, and the analysis of existing plans and policies/codes. The first public workshop was held in January 2010 with 250 citizens attending, providing input on maps and comment forms.

During the spring of 2010, the draft hike and bike network was developed based on fieldwork, input from the public and Steering Committee, and GIS analysis. In April, over 100 citizens attended the second public workshop, providing feedback on the preliminary hike and bike system recommendations. The project team also held a bicycle ride in Downtown Arlington, involving elected officials, police and fire departments, project staff, and citizens (Bicycles Inc. provided bicycles and helmets).

In the summer of 2010, a full Draft Plan was developed that incorporated feedback from the public and Steering Committee. The Plan was comprehensive, addressing not only segment-by-segment recommendations for the hike and bike network, but also focused on bike parking, programs, policies, design guidelines, and implementation strategies.

During the fall of 2010, approximately 100 citizens attended the third public workshop. The City of Arlington, its elected officials, and the general public provided comments and revisions. The Final Plan was adopted by City Council on August 2, 2011.



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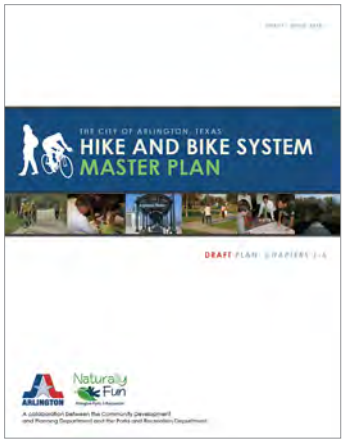

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1) Field research
2) Draft Plan
3) Public workshop

Vision Statements

Hike and bike connectivity (through sidewalks, crosswalks, bicycle lanes, multi-use paths, signed routes, bicycle parking, etc.) will be improved by removing gaps in the current system and connecting neighborhoods, parks, shopping centers, schools, employment centers, greenways, and entertainment venues throughout Arlington.

More people will choose to hike or bike to their destination instead of driving.

Hike and bike routes in Arlington will be connected regionally with neighboring cities.

Arlington will achieve greater economic vitality through walkable and bikeable spaces.

- Biking, hiking, and trail design will be incorporated into all future development/roadways and during roadway reconstruction/repair.
- Education, encouragement, and enforcement programs will be enhanced and added to increase program participation and safety, building courtesy between drivers and cyclists.
- A user-friendly hiking and biking map will be made available to residents to provide information on routes and education. The map will be updated every two to three years.
- Hike and bike facilities will be built properly with safety as a priority in all cases, providing adequate and safe separation of space for bicyclists and pedestrians, using consistent design standards.
- Bicycle parking and bicycle stations with rental system opportunities will become common throughout Arlington providing opportunity and convenience for bicyclists.

Arlington citizens and leaders will become more aware of the economic and health benefits of a more walkable and bikeable Arlington.

Bicycle and pedestrian policy will be integrated into City codes, and a hike and bike culture will be integrated into Arlington life.

Hike and bike routes will connect and be more comprehensive, thereby reducing motor vehicle traffic congestion and improving air quality.

Further hike and bike accommodations will support users of all types including recreational, utilitarian, and commuter users.

Safer pedestrian crossings will be installed with marked crosswalks and countdown signals.

Health and Wellness & Alternative Transportation

It is well documented that an active community is a healthy community. The declining health of America's population is alarming. Study after study affirms that sedentary lifestyles and prolonged periods of inactivity are major deterrents to health, leading to a rise in the occurrence of cardiovascular disease, hypertension, diabetes, osteoporosis and some cancers. Land use and transportation are quickly becoming areas of focus as communities strive to become more walkable, bikeable and accessible. Transportation safety and enhanced mobility along with the pattern and density of development are proven corollaries to community health and wellness.

Safer roadways, greenways, and improved facilities for pedestrians and bicyclists, aid in safety, improve the environment, and encourage more people to enter the outdoors for transportation, recreation, and day-to-day activities.

1

2

3

1. *Cyclists on an Arlington trail.*
2. *Pedestrians at Bob Cooke Park*
3. *Utility bike for everyday trips, like grocery shopping (image from www.yubabike.com)*

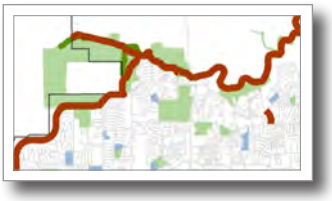
Assessing Needs and Opportunities

School bike rack

Fieldwork and Analysis

The consultant team conducted an in-depth analysis, photo inventory, and evaluation of current conditions for biking and walking:

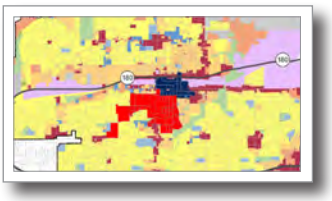
- *190 intersections were inventoried (including photos) for pedestrian crossings. Pedestrian treatments were recommended for each intersection.*
- *Over 200 miles of arterial, collector, and some local roads were analyzed and measured for possible on-road bicycle recommendations.*
- *Special attention was paid to school areas, the Downtown area, roadway crossings, and key destinations.*



GIS data for the Veloweb

Geographic Information Systems (GIS)

GIS data for existing trails, sidewalks, and bicycle lanes was supplemented with aerial photography, transportation data, trip attractors, schools, parcels, waterways, etc. to provide a comprehensive map and tool for developing the recommended hike and bike network. These data resources revealed numerous gaps in the existing sidewalk system and opportunities for new sidewalks.



Snapshot of the City's Land Use Plan

Existing Plans

Numerous plans, guidelines, and strategies have addressed issues relating to hiking and biking in Arlington. They have addressed land use, alternative transportation, roadway design, open space, parks and recreation, and other initiatives. Special consideration was given to current community plans, policies, and documents to better integrate this Hike and Bike Plan into the fabric of area planning efforts, and to incorporate the insights, visions, and findings of other plans as appropriate.

Public input map

Public Input

Public input was gathered through three public meetings and an online comment form. Input at the public meetings was gathered in the form of map markups and comments and through discussion between the citizens, consultant, and City staff. Over 450 people attended the three public workshops showing strong support for the goals of this Plan.

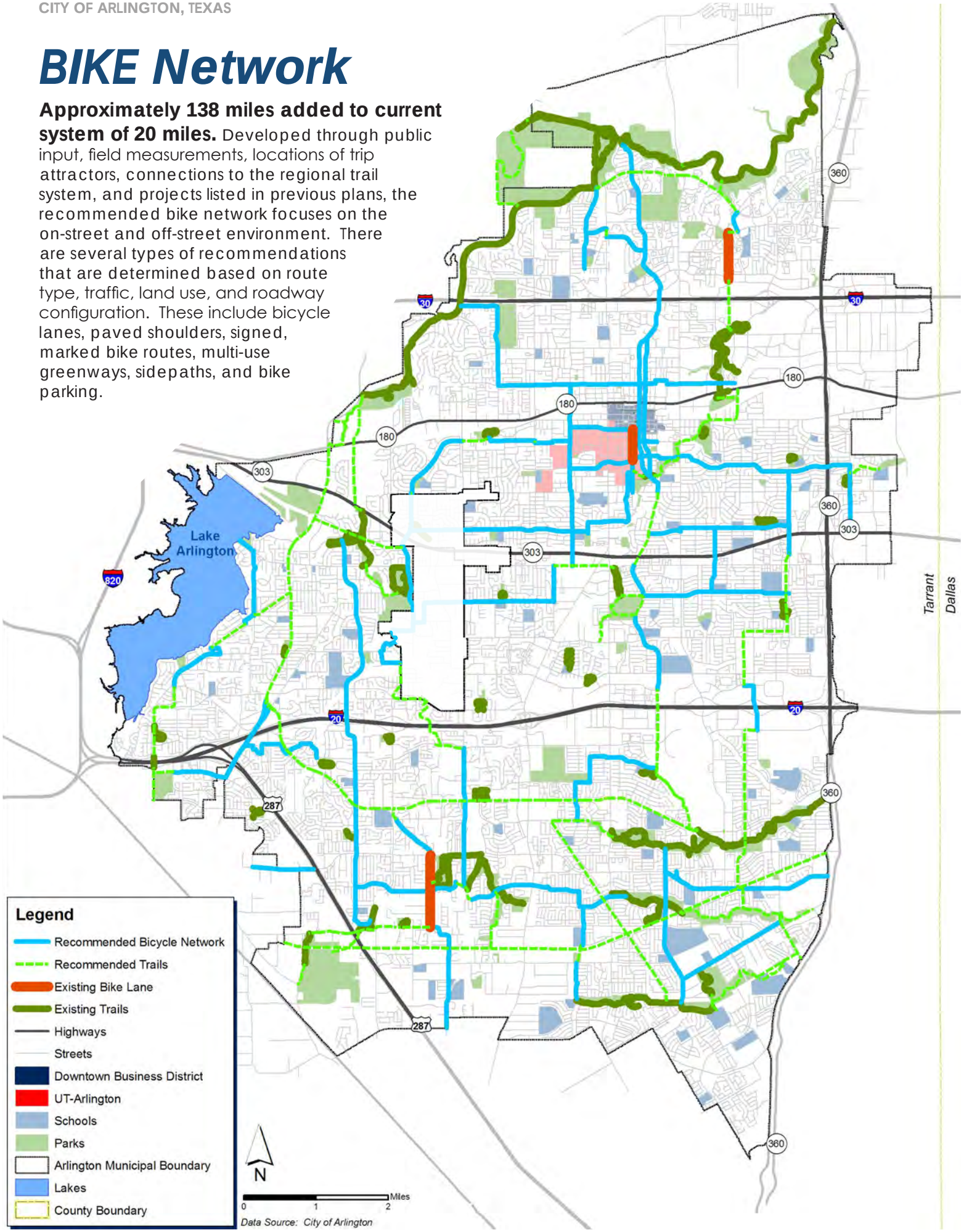
A worn footpath in absence of a sidewalk

Needs Analysis

The need and demand for a more accessible, safe and functional hike and bike system is paramount throughout the City of Arlington. US Census data modeling revealed that an estimated 245,000 pedestrian trips and 28,000 bicycle trips happen daily in Arlington. Health and wellness issues, bicycle and pedestrian crashes, levels of service, and community input all point towards the need for safe, functional accessibility to the outdoors. These needs can be met through a comprehensive on-road and off-road hike and bike system along with the programs, policies, and funding to support this endeavor. This is clearly articulated by the residents who attended open house meetings.

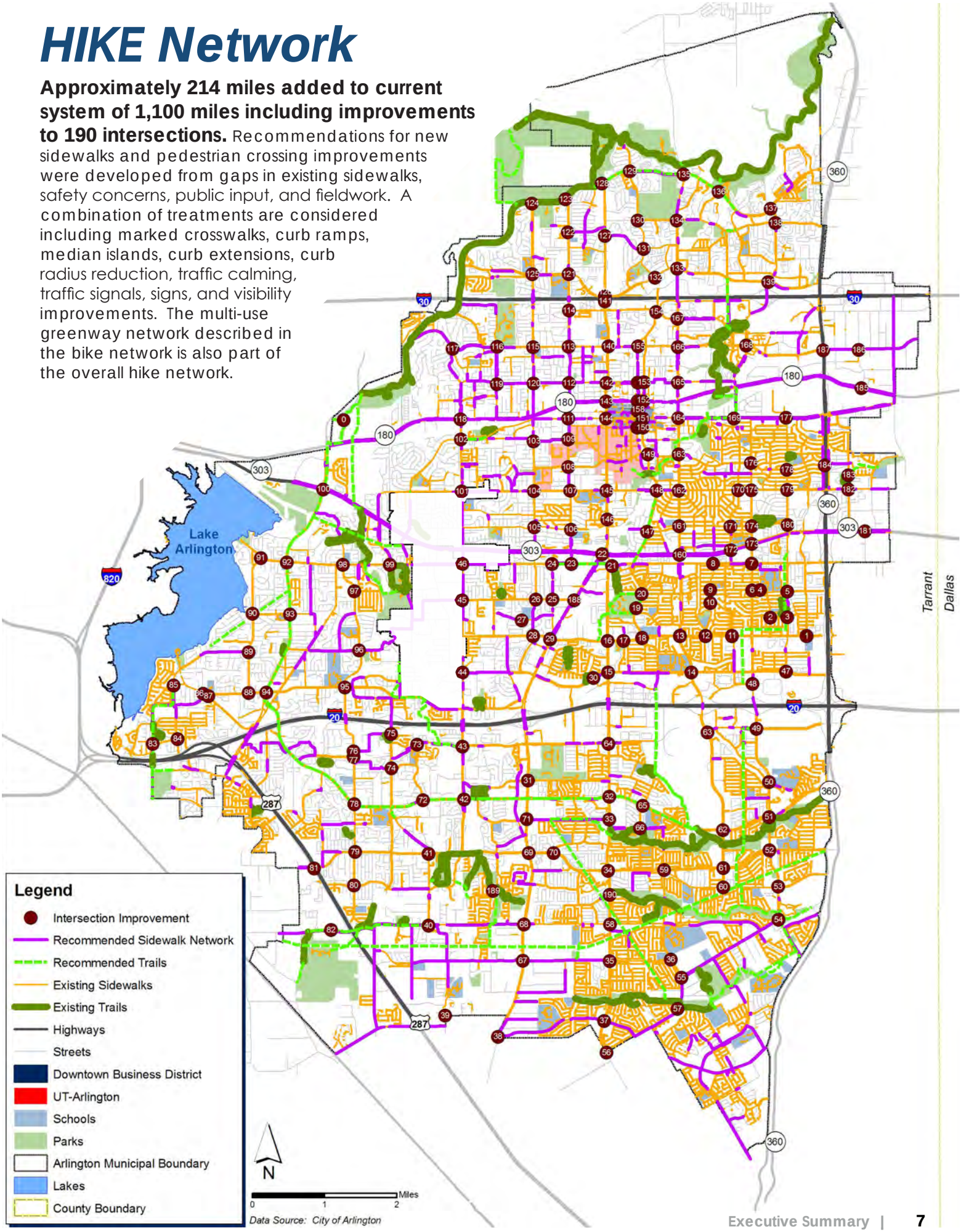
BIKE Network

Approximately 138 miles added to current system of 20 miles. Developed through public input, field measurements, locations of trip attractors, connections to the regional trail system, and projects listed in previous plans, the recommended bike network focuses on the on-street and off-street environment. There are several types of recommendations that are determined based on route type, traffic, land use, and roadway configuration. These include bicycle lanes, paved shoulders, signed, marked bike routes, multi-use greenways, sidepaths, and bike parking.



HIKE Network

Approximately 214 miles added to current system of 1,100 miles including improvements to 190 intersections. Recommendations for new sidewalks and pedestrian crossing improvements were developed from gaps in existing sidewalks, safety concerns, public input, and fieldwork. A combination of treatments are considered including marked crosswalks, curb ramps, median islands, curb extensions, curb radius reduction, traffic calming, traffic signals, signs, and visibility improvements. The multi-use greenway network described in the bike network is also part of the overall hike network.



Hike & Bike Programs

Creation of a successful Hike and Bike System will involve more than physical improvements. The long-term success of the network will also depend on related programming and education.

It will be critical for the City of Arlington to:

- ***inform pedestrians, bicyclists, and motorists about safe behaviors in a multimodal roadway environment,***
- ***enforce laws that make pedestrian and bicycle travel safer,***
- ***encourage people of all ages and abilities to use the hike and bike system, and***
- ***promote and develop programmatic activities that encourage physical, activity and healthy living.***

Key recommended programs include:

- ***the formation of an HBAC (Hike and Bike Advisory Committee),***
- ***Safe Routes to School initiatives,***
- ***Bicycle-friendly community status,***
- ***a user-friendly Hike and Bike map and website that features existing routes and related information,***
- ***targeted enforcement in locations of past accidents involving pedestrians or bicyclists,***
- ***internal staff training, and***
- ***Bike/Walk to Work Day events.***

These programs will enhance the overall health and wellness of the community by promoting, teaching, and enforcing safety.

1

2

3

4

1. *On-road bicycle skills workshop*
2. *Safe Routes to School event*
3. *Arlington City Council Bike Ride (2010)*
4. *Bicycle Rodeo - an education/ encouragement event*

Implementation: Realizing the Vision

Implementing the recommendations within the Hike and Bike System Master Plan will require leadership on the part of the City of Arlington and a dedication to the development of a hike and bike friendly community. *The City of Arlington has several opportunities that can help propel implementation:*

- ***First, is the extensive grassroots interest among citizens and local groups such as "Bike Friendly Arlington (BFA)" and "Friendly Arlington Neighborhoods and Streets (FANS)" that can provide a voice and support for the Plan. An advocacy group should champion this Plan to support implementation.***
- ***A second opportunity is building upon Arlington's great system of existing greenways, sidewalks, and destinations.***
- ***A third opportunity is to take advantage of the region's growth by developing the hike and bike system as part of future development and construction. These opportunities provide a base and starting point for development and implementation.***

Implementing the recommendations of this Plan will require a combination of funding sources that include local, state, federal, and private money. It will be necessary for the City of Arlington to secure funding to undertake the short-term, top priority projects while simultaneously developing a long-term funding strategy to allow for continued development of the overall system. Community foundations and revenue-generating programs for the hike and bike system should also be utilized to raise funds for development and maintenance.

Trail bridge at River Legacy Park

Policy/Administrative Action Steps

1

Consider Adoption of this Plan

The most important action step for the City of Arlington is to adopt, publicize, and champion this Plan. This should be considered the first step in implementation. Through adoption of this document and its accompanying maps as the City's official bicycle, pedestrian, and trails plan, Arlington will be better able to shape transportation and development decisions so that they fit with the goals of this Plan. Most importantly, having an adopted Plan is extremely helpful in securing funding from state, federal, and private agencies. Adopting this Plan does not commit the City to dedicate or allocate funds, but rather indicates the intent of the City to implement this Plan over time, starting with these key action steps.

2

Create an Implementation Strategy

The City of Arlington should develop an internal strategy to implement the Hike and Bike System Master Plan. As a part of this strategy, the City should identify specific individuals and program areas that will be responsible for implementing the various aspects of the Plan from day-to-day efforts to long range goals. The City of Arlington should also consider establishing a Hike and Bike Advisory Committee (HBAC) to assist in implementation. Such a committee should focus on education, advocacy, partnerships, events and community service. It should provide a communications link between the citizens and the City, as well as an avenue for reviewing/revising project priorities.

3

Consider Adoption of a "Complete Streets" Policy

There is a growing national trend towards integrating bicycling, walking and transit as a routine element in roadway projects. This movement has developed under the name of "Complete Streets," which is defined by the Complete the Streets Coalition as follows:

> ***"Complete Streets are designed and operated to enable safe access for all users. Pedestrians, bicyclists, motorists and bus riders of all ages and abilities are able to safely move along and across a complete street."***
>
> ***- www.completethestreets.org***

By adopting a "Complete Streets" policy, the City of Arlington commits to developing new roadways and reconstructing existing roadways to accommodate all users.

4

Become a Bicycle Friendly Community (BFC)
The BFC campaign is an awards program that recognizes municipalities that actively support bicycling. A BFC provides safe accommodation for bicycling and encourages its residents to bike for transportation and recreation. Communities that are bicycle-friendly are seen as places with a high quality of life, and becoming a bicycle friendly community often translates into increased property values, business growth and increased tourism.

5

Launch Programs
The City of Arlington should continue, expand and develop education, encouragement, and enforcement programs, including the Safe Routes to School program. These programs will bring increased visibility to the process and educate the public about hiking and biking safety.

6

Begin Top Priority Projects
The City should consider identifying top priority projects, such as those that are located near the University or those that are low-cost and shovel-ready. The City should establish a process of incorporating hike and bike network recommendations during future funded roadway improvements.

Additional Resources

In addition to these strategies and tools, the Hike and Bike System Master Plan includes other implementation resources. A list of funding sources is included to help Arlington take advantage of its available options. Design guidelines for the hike and bike recommendations are provided to meet facility development needs and serve as a guide for minimum standards. Policy suggestions are geared at updating language in City codes and planning documents to ensure that hiking and biking needs are addressed in future development. For example, a sample bicycle ordinance was crafted to further institute bicycling as a legitimate form of transportation and to improve safety and includes helmet requirements, riding restrictions, and a policy against harassment of bicyclists.

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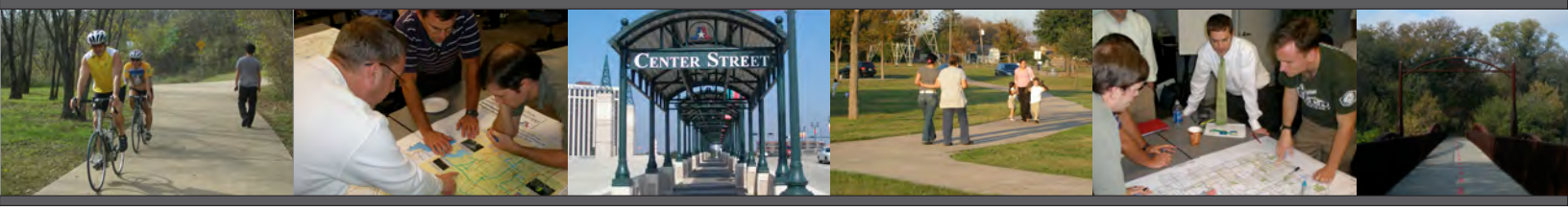
THE CITY OF ARLINGTON, TEXAS

HIKE AND BIKE SYSTEM MASTER PLAN



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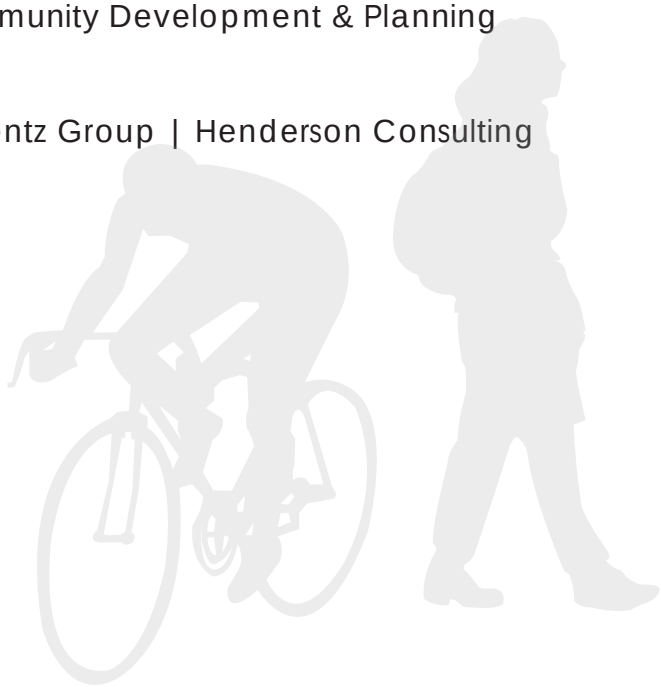

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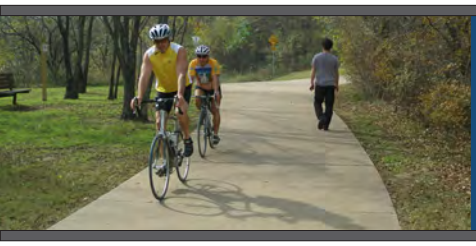

1. INTRODUCTION

Chapter Contents

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1.1 Vision Statements

1.2 Measurable Goals

1.3 The Planning Process

1.4 The Value of the Hike & Bike System

1.5 Plan Components

1.0 Introduction To The Hike & Bike Plan

In the winter of 2009/2010, the City of Arlington began developing a citywide comprehensive Hike and Bike System Master Plan. This would be the first such Plan for the City of Arlington in its history. Nationally, such issues as rising gas prices, environmental concerns, and a growing interest in health and wellness are demonstrating the need for hike and bike-friendly cities. On a local level, this Hike and Bike Plan represents a strong City commitment to take on such issues, translating them into affordable personal mobility, carbon-free transportation, and healthy, active lifestyles for Arlington residents. The chief goal of this Plan is to create an integrated, seamless transportation framework to facilitate hiking and biking as viable transportation alternatives throughout Arlington.

The development of this Plan included an open, participatory process, with residents of Arlington providing input through public workshops, volunteer activities, stakeholder meetings, the project Steering Committee, and an online comment form.

This Plan contains recommendations that are meant to guide Arlington as it develops its hike and bike system. These are not requirements, but should be used to assist the City as it makes decisions related to hike and bike programs, policies and facilities.

This Plan features:

- A thorough analysis of current conditions for hiking and biking in Arlington
- A comprehensive recommended hike and bike network
- Standards and guidelines for the development of a hike and bike system
- Recommendations on how to integrate hike and bike policy into codes and ordinances
- Recommendations for programming, maintenance, and funding

1.1 Vision Statements

Vision statements and project goals were collected through public workshops, project Steering Committee meetings, input from City staff, and an online survey of local residents. These were combined, condensed, and crafted into the vision statement for this Plan.

Arlington Hike & Bike System Vision Statements

- More people will choose to hike or bike to their destination instead of driving.
- Hike and bike connectivity (through sidewalks, crosswalks, bicycle lanes, multi-use paths, signed routes, bicycle parking, etc.) will be improved by removing gaps in the current system and connecting neighborhoods, parks, shopping centers, schools, employment centers, greenways, and entertainment venues throughout Arlington.
- Hike and bike routes in Arlington will be connected regionally with neighboring cities.
- Hike and bike routes will connect and be more comprehensive, thereby reducing motor vehicle traffic congestion and improving air quality.
- Safer pedestrian crossings will be installed with marked crosswalks and countdown signals.
- Biking, hiking, and trail design will be incorporated into all future development/roadways and during roadway reconstruction/repair.
- Arlington citizens and leaders will become more aware of the economic and health benefits of a more walkable and bikeable Arlington.
- The hike and bike system will be built properly with safety as a priority in all cases, providing adequate and safe separation of space for bicyclists and pedestrians, using consistent design standards.
- Bicycle parking and bicycle stations with rental system opportunities will become common throughout Arlington providing opportunity and convenience for bicyclists.
- Further hike and bike accommodations will support users of all types including recreational, utilitarian, and commuter users.
- The City of Arlington will achieve greater economic vitality through walkable and bikeable spaces.
- Bicycle and pedestrian policy will be integrated into City codes, and a hike and bike culture will be integrated into Arlington life.
- Education, encouragement, and enforcement programs will be enhanced and added to increase program participation and safety, building courtesy between drivers and cyclists.
- A user-friendly hiking and biking map will be made available to residents to provide information on routes and education. The map will be updated every two to three years.

1.2 Measurable Goals

The purpose of this Plan is to make this vision a reality. Measurable goals, derived from this vision, are listed below. While the City of Arlington must lead this effort, overall success will also require continued, active participation and encouragement from local residents and community organizations. The ultimate goal is for this Plan to be fully implemented within a 30-year time frame.

The City should meet annually to evaluate progress on each of the following goals, including an official Plan update approximately five years from the date of adoption of this Plan. During each evaluation, City staff and members of a citizen's advisory board should identify steps to be taken before the next evaluation.

Arlington Hike & Bike System Master Plan Goals

1. Reduce the number of bicycle and pedestrian accidents.
2. Increase the miles of bike lanes as a percent of total city roadways; double the miles of off-road trails.
3. Double the 2000 Census bicycle and pedestrian commute rate by 2016.
4. Complete five hike and bike projects by 2012 and complete an additional five projects by 2016.
5. Become designated as a 'Bicycle-Friendly Community' by 2012 by the League of American Bicyclists.
6. Launch/participate in three new programs in three years (see Chapters 5 and 6 for details):

   A) Hike and Bike Education and Encouragement Program

   - Create a citizens Hike and Bike Advisory Committee to meet on a regular basis and support implementation of this Plan.
   - Produce online and hardcopy bicycle maps and obtain a variety of educational materials for distribution that cover bicycle and pedestrian safety, etiquette, and rules and regulations.
   - Engage and partner with multiple Arlington area schools to become involved with national Safe Route to School programs and funding opportunities.

   B) Bicyclist, Pedestrian, and Motorist Enforcement Program and Internal Training

   - Provide officers with an educational handout to be used during hike and bike-related citations and warnings.
   - Training for planning, public works, engineering, and law enforcement staff that focus on hiking and biking-related issues.

   C) Bicycle Facility Development Program

   - Establish regular CIP funding for roadway retrofits and restriping.
   - Integrate bicycle-related improvements with scheduled roadway maintenance and restriping projects.
   - Add bicycle parking racks throughout the City.

1.3 The Planning Process

The planning process began in November 2009 and concluded in the fall of 2010. This diagram illustrates the main steps taken throughout the planning process. Public participation (through workshops, Steering Committee meetings, and the online survey) played a key role in Plan development.

1.4 The Value of the Hike & Bike System

Given the extensive commitment of time and resources needed to fulfill the goals of this Plan, it is also important to assess the immense value of bicycle and pedestrian transportation. As stated by Arlington residents during the public input process, hiking and biking will help to improve people's health and fitness, improve livability, enhance environmental conditions, decrease traffic congestion, and contribute to a greater sense of community.

Scores of studies from experts in the fields of public health, urban planning, urban ecology, real estate, transportation, sociology, and economics have supported such claims and affirm the substantial value of supporting bicycling and walking as it relates

to active living and alternative transportation. Communities across the United States and throughout the world are implementing strategies for serving the hiking and biking needs of their residents, and have been doing so for many years. They do this because of their obligations to promote health, safety and welfare, and also because of the growing awareness of the many benefits of bicycling.

"The CDC determined that creating and improving places to be active could result in a 25 percent increase in the number of people who exercise at least three times a week."

-U.S. Department of Health and Human Services, Centers for Disease Control and Prevention

Increased Health and Physical Activity

A growing number of studies show that the design of our communities—including neighborhoods, towns, transportation systems, parks, trails and other public recreational facilities—affects people's ability to reach the recommended daily 30 minutes of moderately intense physical activity (60 minutes for youth). According to the Centers for Disease Control and Prevention (CDC), "physical inactivity causes numerous physical and mental health problems, is responsible for an estimated 200,000 deaths per year, and contributes to the obesity epidemic." [1] The increased rate of disease associated with inactivity reduces quality of life for individuals and increases medical costs for families, companies, and local governments.

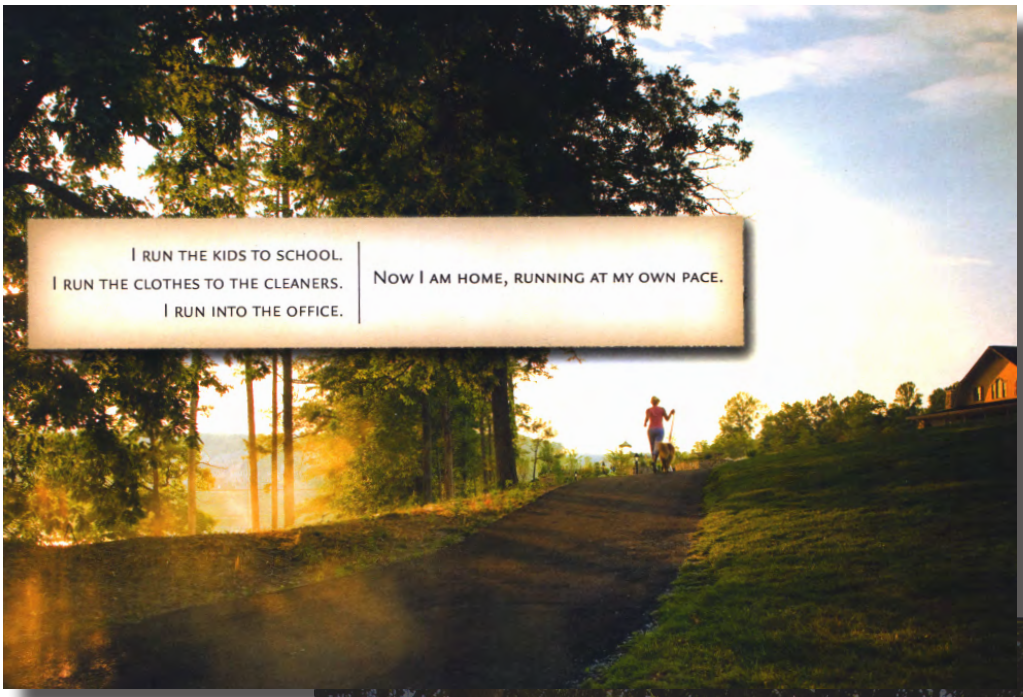
The CDC determined that creating and improving places to be active could result in a 25 percent increase in the number of people who exercise at least three times a week. [2] This is significant considering that for people who are inactive, even small increases in physical activity can bring measurable health benefits. Establishing a safe and reliable hike and bike network in Arlington will positively impact the health of local residents. The Rails-to-Trails Conservancy puts it simply: "Individuals must choose to exercise, but communities can make that choice easier." [3]

A new residential development advertises the "Last Greenway Sites Available"

Economic Benefits

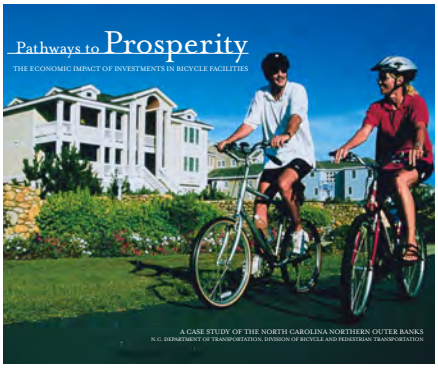
Bicycling is an affordable form of transportation. According to the Pedestrian and Bicycle Information Center (PBIC), of Chapel Hill, NC, the cost of operating a bicycle for a year is approximately $120, compared to $7,800 for operating a car over the same time period.[4] Bicycling becomes even more attractive from an economic standpoint when the rising price of oil (and decreasing availability) is factored into the equation. Since 2000, oil prices have more than quadrupled. As of summer 2008, gasoline prices topped $4 a gallon and are generally forecasted to continue to increase.[5] The rising cost of fuel reinforces the idea that local communities should be built to accommodate people-powered transportation, such as walking and biking.

From a real estate standpoint, consider the positive impact of trails and greenways, which are essential components of a complete hike and bike network. According to a 2002 survey of recent homebuyers by the National Association of Home Realtors and the



Developers are taking advantage of the positive impact of trails on property values by marketing their greenways; left and below are examples of two magazine advertisements from developers that focus their marketing on greenways.

National Association of Home Builders, trails ranked as the second most important community amenity out of a list of 18 choices.[6] Additionally, the study found that 'trail availability' outranked 16 other options including security, ball fields, golf courses, parks, and access to shopping or business centers. Findings from the American Planning Association (How Cities Use Parks for Economic Development, 2002), the Rails-to-Trails Conservancy (Economic Benefits of Trails and Greenways, 2005), and the Trust for Public Land (Economic Benefits of Parks and Open Space, 1999) further substantiate the positive connection between trails and property values across the country.



Download the full report, "Pathways to Prosperity", from: http://ncdot.org/transit/bicycle/safety/safety_economicimpact.html

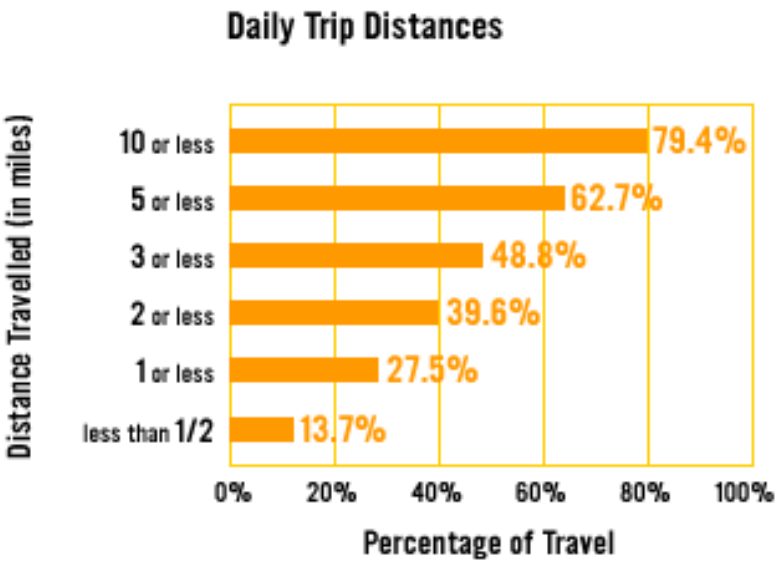
Finally, from a tourism perspective, cyclists can add real value to local economies. For example, in the Outer Banks, NC, bicycling is estimated to have an annual economic impact of $60 million; 1,407 jobs are supported by the 40,800 visitors for whom bicycling was an important reason for choosing to vacation in the area. The annual return on bicycle facility development in the Outer Banks is approximately nine times higher than the initial investment.[7] Similarly, Damascus, VA, the self-proclaimed 'Friendliest Trail Town', features 34-miles of trail where approximately $2.5 million is spent annually related to recreation visits. Of this amount, non-local visitors spend about $1.2 million directly into the economies of Washington and Grayson counties.[8] While these examples feature beach and mountain destinations, the City of Arlington also has key hiking and biking advantages, such as the River Legacy Park, which is a regional draw for a large population of potential riders.

Environmental Improvements

As demonstrated by the Southern Resource Center of the Federal Highway Administration, when people get out of their cars and walk or bike, they reduce measurable volumes of pollutants.[9] Other environmental impacts include a reduction in overall neighborhood noise levels and improvements in local water quality as fewer automobile-related discharges wind up in the local rivers, streams, and lakes.

Trails and greenways are also part of any hike and bike network, conveying unique environmental benefits. Greenways protect and link fragmented habitats and provide opportunities for protecting plant and animal species. Aside from connecting places without the use of air-polluting automobiles, trails and greenways also reduce air pollution by protecting large areas of plants that create oxygen and filter air pollutants such as ozone, sulfur dioxide, carbon monoxide and airborne particles of heavy metal. Finally, greenways improve water quality by creating a natural buffer zone that protects streams, rivers and lakes, preventing soil erosion and filtering pollution caused by

Below: 'Daily Trip Distances' chart from the Bicycle and Pedestrian Information Center website, www.pedbikeinfo.org



Above: By walking or biking for our trips that are less than 2 miles, we could eliminate 40% of local car trips.

agricultural and road runoff.

Transportation Benefits

In 2001, the National Household Travel Survey found that roughly 40% of all trips taken by car are less than 2 miles. By taking these short trips on a bicycle or by foot, rather than in a car, citizens can substantially impact local traffic and congestion. Additionally, many people do not have access to a vehicle or are not able to drive. According to the National Household Travel Survey (NHTS), one in 12 U.S. households does not own an automobile and approximately 12% of persons 15 or older do not drive.[10] An improved hike and bike network provides greater and safer mobility for these residents.

Traffic congestion is often a major problem in fast growing areas such as the Dallas-Fort Worth region (Arlington is the 49th largest city in the United States in terms of population; the Dallas-Fort Worth-Arlington metropolitan area is the fourth largest metropolitan area in the United States).[11] Congestion reduces mobility, increases auto-operating costs, adds to air pollution, and causes stress. Bicyclists and pedestrians can help alleviate overall congestion because each cyclist presents one less car on the road. Incidentally, cyclists take up significantly less space on the road. While some may argue over the degree to which overall congestion is alleviated by cyclists and walkers, one aspect of the argument is particularly difficult to challenge: for the individuals who choose to ride a bike or walk rather than drive, the negative impacts of congestion (stress, operating costs, and sometimes even mobility) are greatly reduced.

Quality of Life

Many factors go into determining quality of life for the citizens of a community: the local education system, prevalence of quality employment opportunities, and affordability of housing are all items that are commonly cited. Increasingly though, citizens claim that access to alternative means of transportation and access to quality recreational opportunities such as parks, trails, greenways, and bicycle routes, are important factors for them in determining their overall pleasure within their community. Communities with such amenities can attract new businesses, industries, and in turn, new residents. Furthermore, quality of life is positively impacted by bicycling and hiking through the increased social connections that take place by residents being active, talking to one another and spending more time outdoors and in their communities.

According to the Brookings Institution, the number of older Americans is expected to double over the next 25 years.[10] All but the most fortunate seniors will confront an array of medical and other constraints on their mobility even as they continue to seek both an active community life, and the ability to age in place. Trails built as part of the hike and bike transportation network generally do not allow for motor vehicles. However, they do accommodate motorized wheelchairs, which is an important asset for the growing number of senior citizens who deserve access to independent mobility.

Children under 16 are another important subset of our society who deserve access to safe mobility and a higher quality of life. According to the U.S. Environmental Protection Agency, fewer children walk or bike to school than did so a generation ago. In 1969, 48 percent of students walked or biked to school, but by 2001, less than 16 percent of students between 5 and 15 walked or biked to or from school.[13]

According to the National Center for Safe Routes to School, "Walking or biking to school gives children time for physical activity and a sense of responsibility and independence; allows them to enjoy being outside; and provides them with time to socialize with their parents and friends and to get to know their neighborhoods."[14] In a 2004 CDC survey, 1,588 adults answered questions about barriers to walking to school for their youngest child aged 5 to 18 years.[15] The main reasons cited by parents included distance to school, at 62%, and traffic-related danger, at 30%. Strategic additions to Arlington's trail system could shorten the distance from homes to schools, and overall hike and bike improvements can improve the safety of our roadways.

1.5 Plan Components

This Plan document includes the following major components:

- This Introduction presents the background, visions and goals, planning process, and the benefits of a hikable and walkable City (Chapter 1).
- An assessment of Current Conditions that overviews existing hike and bike conditions, land use, trip attractors, and also summarizes existing related plans (Chapter 2).
- A Demand and Needs Analysis that examines mode-share, models bicycle and pedestrian activity, and presents key findings from the public input process (Chapter 2).
- A recommended Bike Network that outlines a framework of connected recommendations (Chapter 3).
- A recommended Hike Network that outlines a framework of connected recommendations (Chapter 4).
- Key Program Recommendations for education, encouragement, and enforcement (Chapter 5).
- Implementation recommendations that outline specific steps for achieving the Plan's key elements (Chapter 6).
- Design Guidelines to guide the City of Arlington in current hike and bike design and standards (Chapter 7).
- Appendices that provide a summary of public input, the bicycle network segment table, funding recommendations, program resources, recommendations for potential policy revisions, intersection inventory and recommendations tables, and tiled map recommendations.

Footnotes from, "The Value of the Hike and Bike System":

1. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. (1996). Physical Activity and Health: A Report of the Surgeon

General.

2. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. (2002). Guide to Community Preventive Services.

3. Rails-to-Trails Conservancy. (2006) Health and Wellness Benefits.

4. Pedestrian and Bicycle Information Center. (2008). Economic Benefits: Money Facts. Retrieved 8/8/2008 from www.bicyclinginfo.org/why/benefits_economic.cfm

5. King, Neil. The Wall Street Journal: Another Peek at the Plateau. (2/27/08): In February 2008, the Wall Street Journal quoted industry experts, stating, "supply constraints could push the price of oil to $150 a barrel by 2010".

6. National Association of Realtors and National Association of Home Builders. (2002). Consumer's Survey on Smart Choices for Home Buyers.

7. NCDOT and ITRE. (2006). Bikeways to Prosperity: Assessing the Economic Impact of Bicycle Facilities.

8. Virginia Department of Conservation. (2004). The Virginia Creeper Trail: An Assessment of User Demographics, Preferences, and Economics.

9. Federal Highway Administration, Southern Resource Center. (1999). Off-Mode Air Quality Analysis: A Compendium of Practice. To calculate air quality benefits of bicycling, first calculate the Daily VMT reduction. VMT Reduction = PD * Area * L * BMS, where PD = Population density, persons/mile; Area = Project length * 1 mile radius, mile; L = Round trip length, one-half of the project length times 2 daily trips, miles; BMS = Bike mode share, %. Last, calculate the Daily Emission reductions for a pollutant. Ed = EFx * VMT Reduction, where Ed = Daily Emissions, grams/day; EFx = Emission factor for pollutant x, grams/mile; VMT = vehicle mile/day.

10. U.S. Department of Transportation (DOT), Bureau of Transportation Statistics (BTS) and the Federal Highway Administration (FHWA). (2002). National Household Travel Survey.

11. Wikipedia (Internet). http://en.wikipedia.org/wiki/Dallas & http://en.wikipedia.org/wiki/Arlington.

12. Brookings Institution. 2003. The Mobility Needs of Older Americans: Implications for Transportation Reauthorization.

13. US EPA. (2003). Travel and Environmental Implications of School Siting.

14. National Center for Safe Routes to School. (2006). National Center for Safe Routes to School
Talking Points.

15. Centers for Disease Control and Prevention. The Importance of Regular Physical Activity for Children. Accessed 9/16/05 at http://www.cdc.gov/nccdphp/dnpa/kidswalk/health_benefits.htm.

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2. CURRENT CONDITIONS

Chapter Contents

2.0 Overview

2.1 Current Conditions Methodology

2.2 Pedestrian Conditions

2.3 Bicycle Conditions

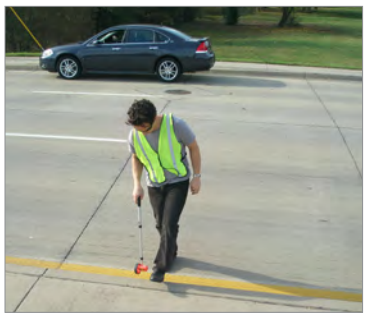
2.4 Demand and Needs Analysis

2.5 Demographic Analysis

2.6 Existing Plan Summaries

2.7 Public Input

Steering committee members providing input during the kick-off meeting.



A project consultant taking inventory of on-road conditions for bicycling and walking.

2.0 Overview

This chapter contains a description of work and a summary of existing conditions for the City of Arlington. This existing conditions analysis led the development of the Hike & Bike networks.

2.1 Current Conditions Methodology

The consultant team conducted a thorough investigation and analysis of existing conditions. The major categories of analysis are described below.

Fieldwork

The consultant team conducted an on-the-ground analysis of Arlington by examining, documenting, and photographing existing bicycle and pedestrian conditions. Special attention was paid to school areas, the Downtown area, crossings, and other destinations.

Accomplishments included:

- ~190 intersections were inventoried and photo inventoried for pedestrian crossings. Recommended pedestrian treatments were developed for each intersection.
- Over 200 miles of arterial, collector, and subcollector roads were analyzed and measured for possible on-road bicycle recommendations.
- Active bicyclists and pedestrians were observed and photographed.
- Existing, exemplary facilities were noted and photo-inventoried.

GIS Development

The consultant team collected existing GIS data layers and developed new data as well. Tasks accomplished include:

- Update/revision of existing trails/bicycle lanes
- Demographic data and map development
- Development of preliminary bicycle and pedestrian network recommendations

Existing Plan Review
Existing, relevant plans, documents, and ordinances were reviewed and summarized.

2.2 Pedestrian Conditions (Maps 2.1 and 2.2)

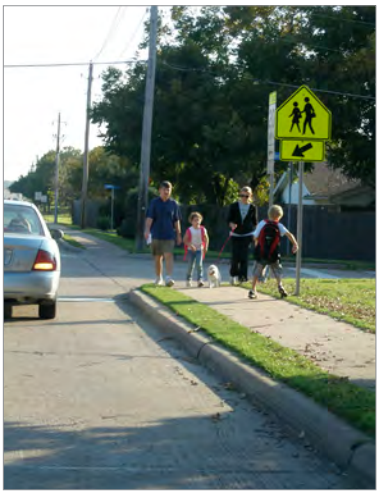
The City of Arlington has many pedestrian features such as sidewalks, crossing facilities, and trails. There are nearly 1,100 miles of sidewalks in the City as seen in Map 2.1. Nearly 18 miles of the Veloweb (a regional off-road bicycle path network) are complete and provide excellent, paved, multi-use trails for recreation and transportation. These facilities provide a good foundation for a more comprehensive pedestrian network throughout the region.

However, there are still several key corridors that lack sidewalks and/or have sidewalk gaps. Also, there are communities within Arlington that have plentiful sidewalks while others are lacking. This is a result of historic development patterns and more recent development regulations. These are evident and displayed in the Pedestrian Gaps map (Map 2.2).

There are many pedestrian intersection crossing treatments throughout the City of Arlington. However, most intersections lack complete and updated pedestrian solutions. Complete inventories and preliminary recommendations may be found in Appendix F.

Strengths of Existing Pedestrian Facilities

- Many intersections already contain functional pedestrian elements including pedestrian-activated signals and marked crosswalks.
    - A majority of the intersections have good visibility.
    - A majority of the intersections are signalized with pedestrian crossing signals.
    - A majority of the intersections have pedestrian access by means of sidewalks.
    - A majority of the intersections have existing marked crosswalks.
    - A majority of the intersections are accessible (contain curb ramps).
    - Many of the intersections have existing medians that can be utilized for pedestrian refuge areas.
- Downtown Arlington has excellent pedestrian accommodations within and around the Downtown core (Abram Street/Center Street/City Hall).
- The regional trail system is complete in several locations including the northern parts of Arlington (along the Trinity River and Green Oaks Blvd.) and near Cowboys Stadium.



Existing pedestrian amenities like downtown sidewalks (top), Davis Street sidewalks (middle) and the Veloweb (bottom) provide a good foundation for a more comprehensive pedestrian network.

Pedestrian crossing at the Center Street Bridge.

- Recent bridge reconstruction projects across I-30 feature excellent pedestrian accommodations including covered walkways, architectural lighting, and murals. These provide gateways into the Entertainment District and Downtown Arlington.

- Center Street has been transformed into a walkable gateway into Downtown from the north, including the Center Street bridge.

- A number of local park greenways and trails have been developed including the Lynn Creek Greenway.

Deficiencies of Existing Pedestrian Accommodations

Below: Worn foot paths may be observed where there is no sidewalk, indicating use and need.

- Numerous gaps in the sidewalk system exist, leaving some neighborhoods and destinations disconnected from other areas. In many cases, worn foot paths may be observed where there is no sidewalk, indicating use and need. Key corridors that lack sidewalks and/or have significant gaps include:

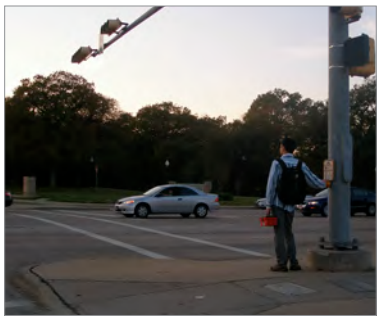
    - Cooper Street
    - Pioneer Parkway
    - Abram Street
    - Division Street
    - Mansfield Webb Road
    - Sanford Street

- Safe pedestrian crossings of I-20 and I-30 are lacking. I-30 crossings are being improved with reconstructed bridges, but I-20 crossings are quite dangerous without adequate pedestrian treatments.

- Pedestrians are accommodated at most intersection crossings, but many are lacking complete treatments. Roadways such as Collins Street and Cooper Street are difficult to cross.

    - Many of the high traffic volume intersections do not have high visibility pedestrian warning signage.
    - While pedestrian signals are numerous, the majority are not countdown signals.
    - A majority of the intersections require restriping or additional striping for crosswalks and advanced stop bars.
    - A majority of the intersections require additional accessible ramps or improvements to the existing accessible ramps to meet current ADA guidelines (truncated dome warning strips).

Below: While pedestrian signals are numerous, most are not countdown signals.

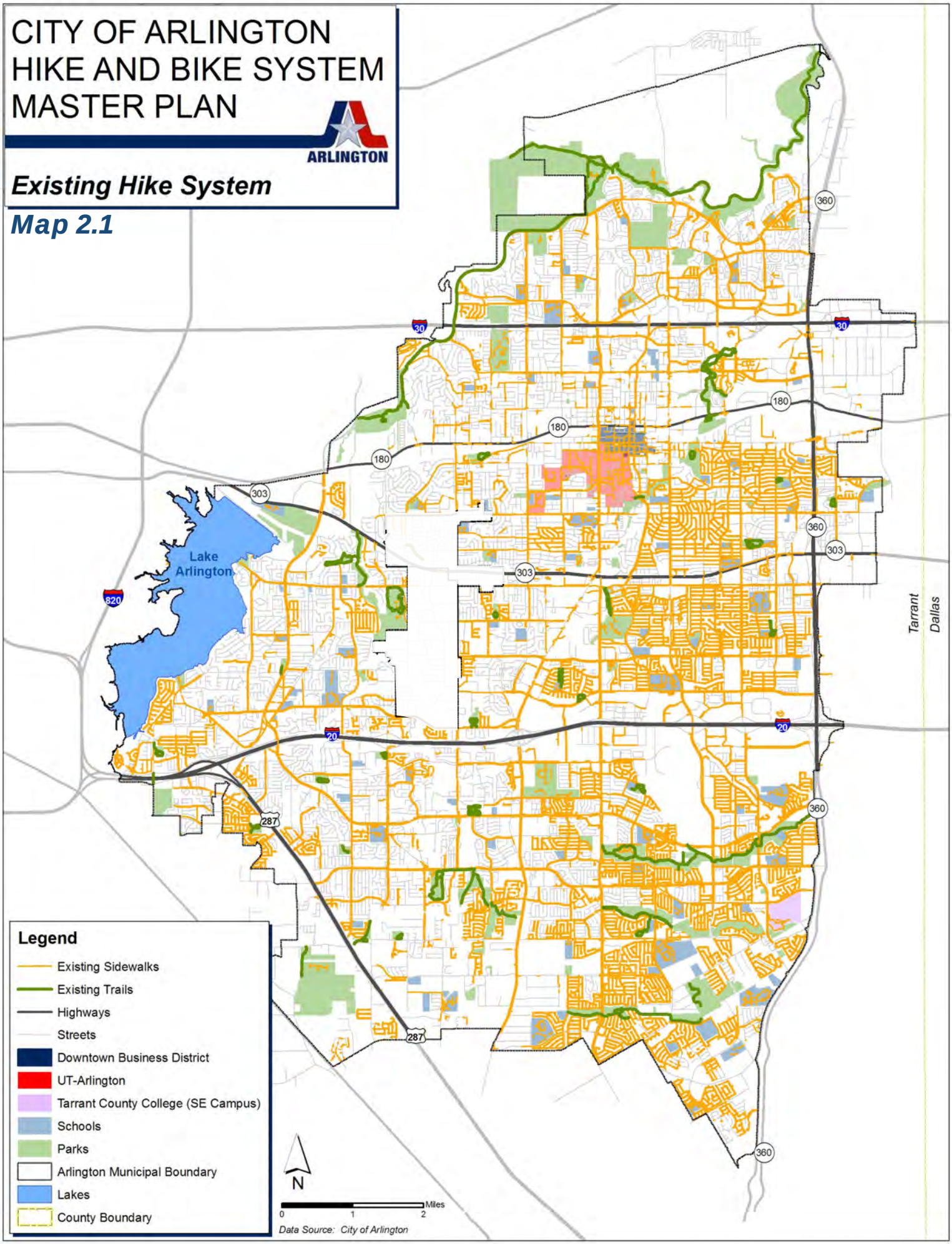


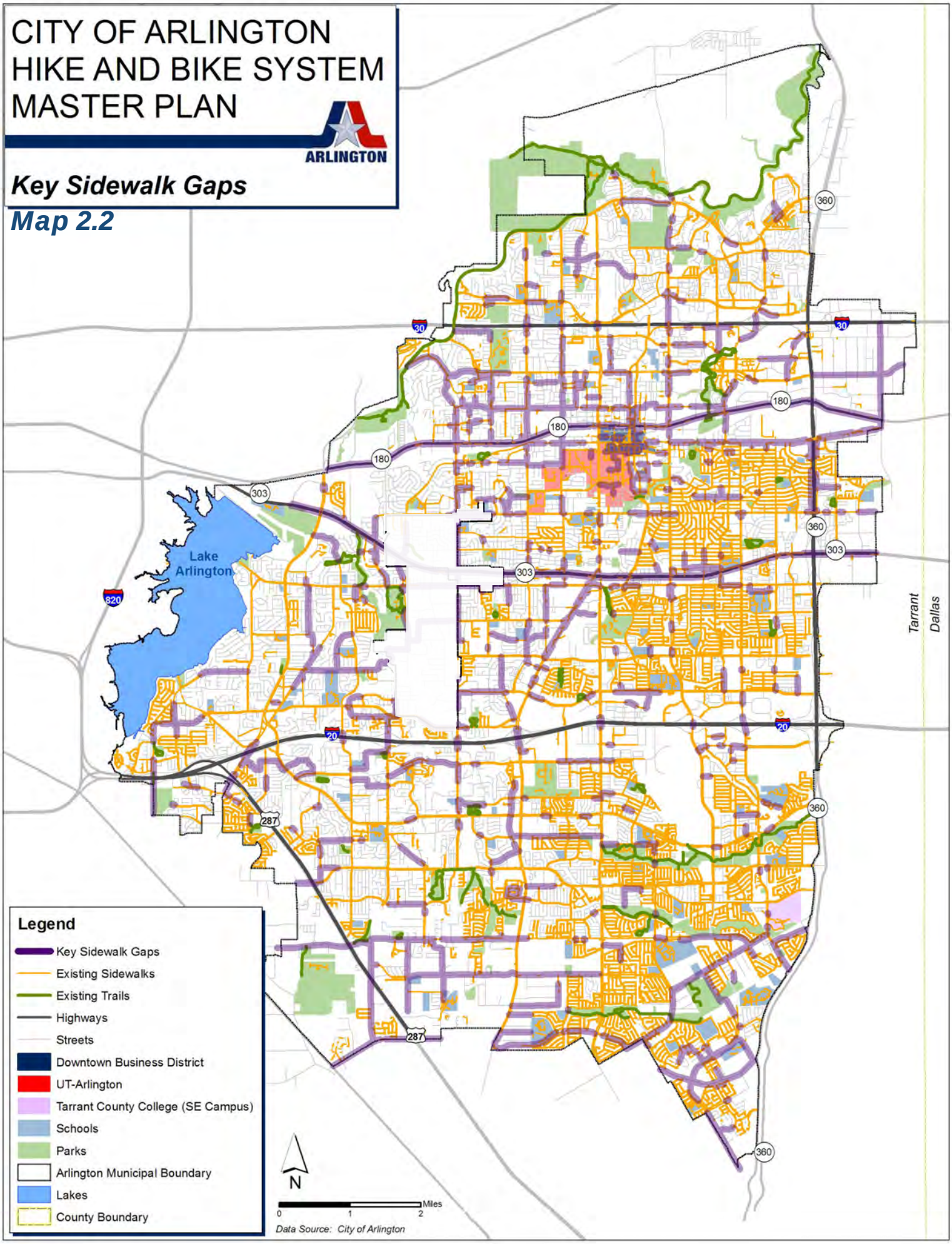
CITY OF ARLINGTON HIKE AND BIKE SYSTEM MASTER PLAN

ARLINGTON

Existing Hike System

Map 2.1




CITY OF ARLINGTON
HIKE AND BIKE SYSTEM
MASTER PLAN
ARLINGTON
Key Sidewalk Gaps
Map 2.2
Lake Arlington
Tarrant
Dallas
Legend
Key Sidewalk Gaps
Existing Sidewalks
Existing Trails
Highways
Streets
Downtown Business District
UT-Arlington
Tarrant County College (SE Campus)
Schools
Parks
Arlington Municipal Boundary
Lakes
County Boundary
N
Miles
0
1
2
Data Source: City of Arlington

- Many marked crosswalks are low-visibility (two parallel stripes) and many of those are faded.
- Some high volume intersections are not signalized and do not have controlled pedestrian crossings.
- A majority of the existing medians are not paved or accessible and will require upgrading to be utilized as a pedestrian refuge area.

- In-roadway, mid-block pedestrian crossing signs are lacking and would be useful, especially around heavy pedestrian activity such as downtown intersections and schools.

- Pedestrians were often seen crossing roads not in the designated crosswalk.

Intersection Inventory Tables

- See Appendix F for the complete inventory of pedestrian conditions at intersections.

2.3 Bicycle Conditions (Map 2.3)

The City of Arlington is currently not bicycle-friendly. The City has begun taking steps to improve conditions with the development of an off-street trails system. However, the majority of roads in the City pose numerous dangers to bicyclists as they travel to and from destinations. Hazardous conditions exist along these types of corridors, including:

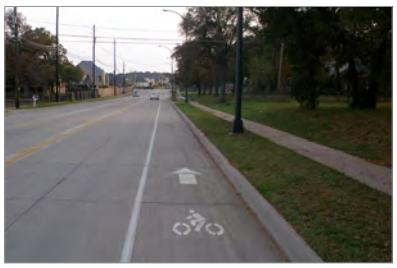
- Commercial corridors that are designed solely for motorized transportation
- Multiple-lane high-speed roadways
- Narrow roadways with little or no shoulders
- Dangerous railroad and driveway crossings

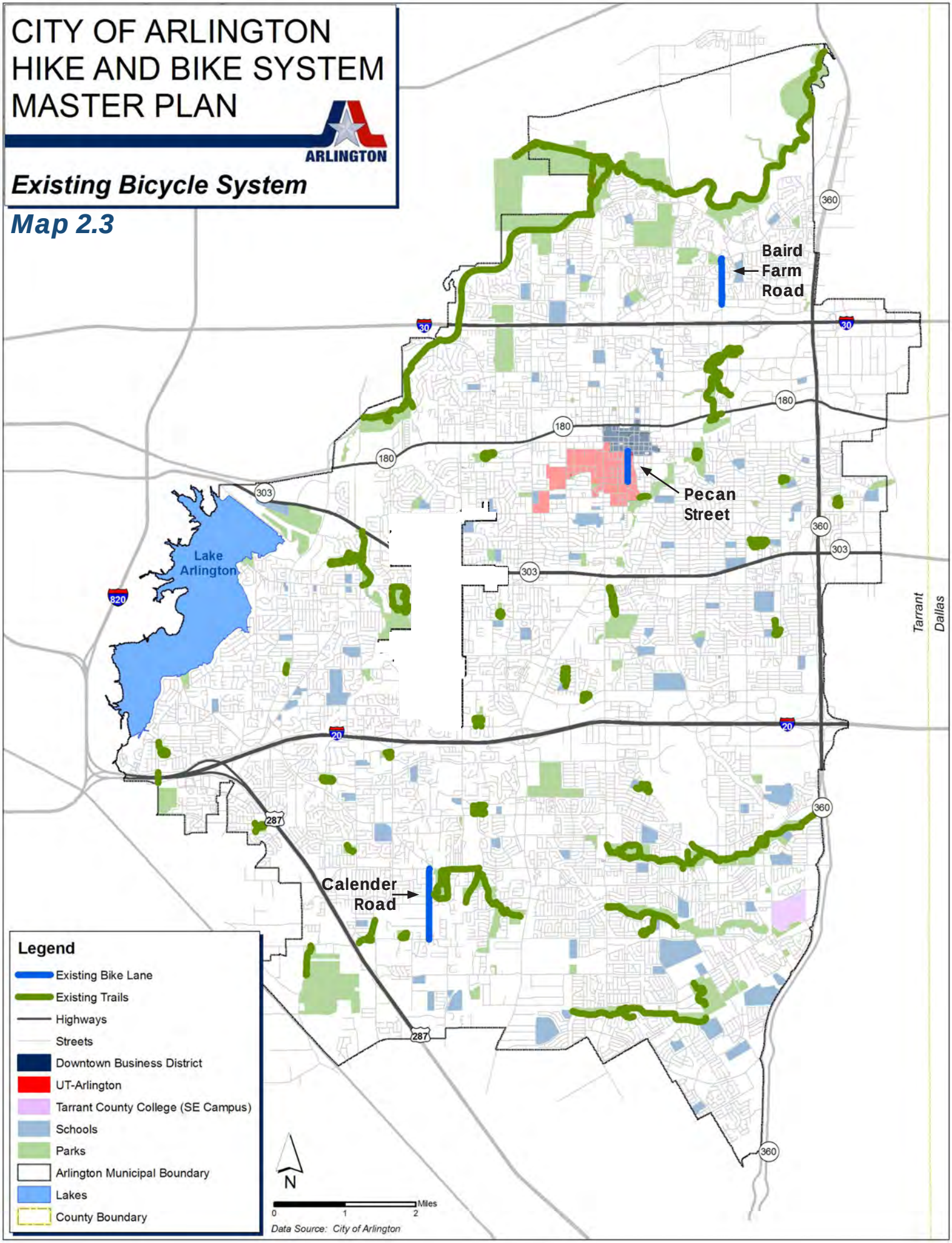
Furthermore, it was observed that few bicyclists wear helmets while riding and often ride in the wrong direction.

Strengths of Existing Bicycle System

- The off-street trail system features paved, multi-use paths that provides a great transportation and recreation corridor. Many roadway crossings are below-grade keeping bicycle and pedestrian traffic completely separated from vehicular roadway traffic.

Below: The existing portions of the regional trail system and existing bicycle lanes provide a strong starting point for the future bicycle network.




CITY OF ARLINGTON
HIKE AND BIKE SYSTEM
MASTER PLAN
ARLINGTON
Existing Bicycle System
Map 2.3
Baird Farm Road
Pecan Street
Calender Road
Lake Arlington
Tarrant
Dallas
Legend
Existing Bike Lane
Existing Trails
Highways
Streets
Downtown Business District
UT-Arlington
Tarrant County College (SE Campus)
Schools
Parks
Arlington Municipal Boundary
Lakes
County Boundary
N
Miles
0
1
2
Data Source: City of Arlington

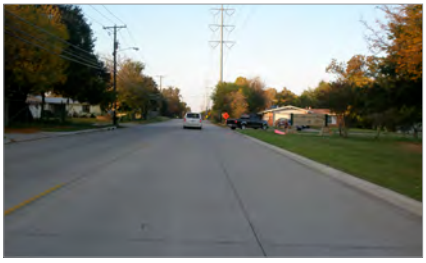
Deficiencies of Existing Bicycle Facilities

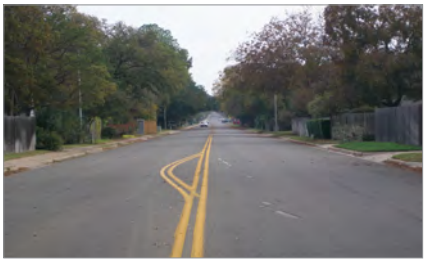
- There is an overall lack of on-road bicycle facilities throughout the City of Arlington.
- Adequate and secure bike parking facilities are lacking and need to be located throughout the City through the usage of inverted U-racks.
- Bicyclists were observed not wearing helmets, riding in the wrong direction (facing traffic), and crossing roads randomly at mid-block.
- Existing bicycle lanes on Pecan Street are substandard.

Above: Example of a cyclist riding against traffic without a helmet, here along E. Sanford Street.

Strengths of Existing Road Network

- Streets within the Downtown area and UT-Arlington are on a good grid system for all transportation modes and many have low automobile speeds.
- There are significant opportunities for the addition of bicycle lanes through simple striping projects (existing roadways with wide outside lanes), restriping projects (existing roadways in which lanes can be narrowed to accommodate bicycle lanes), and travel lane conversion projects (existing roadways operating with excess capacity that could decrease the number of lanes to accommodate bicycle lanes).
- Alternative residential routes are ideal to busy parallel roads. In many cases, these roads have a wide-2 lane configuration, providing adequate space for bike lanes.





There are significant opportunities for the addition of bicycle routes on wide, lower traffic volume roadways (example roadways shown above on Sherry Street and Tucker Blvd).

Deficiencies of Existing Road Network

- There are many wide high-volume commercial roadways throughout the City with high speeds and little space for safe bicycling.
- High frequency of driveways and parking lot curb-cuts present repeated hazards to cyclists as the automobile crosses the cyclists' path of travel.
- Many roads were designed around the automobile and need to be redesigned or re-striped to become more bicycle friendly. Narrowing existing lanes could also help reduce speeding and the hazards that speeding presents to cyclists, pedestrians, and drivers.

Above: A bicyclist preparing to cross one of Arlington's many high-volume commercial roadways.

- The 4-lane, center-divided wide median roadway is common and a detriment for simple bike lane addition through restripe (because most are 23' 10" to 24' for two lanes on each side). Bike lanes could be added, but only through demolition of existing curb and reducing the size of the median (reconstruction). This effort will be more costly.
- There are also some roadways throughout the City that are too narrow for bicyclists to travel safely on them. These roads have little or no shoulder and have relatively high vehicle travel speeds which pose multiple hazards for bicyclists.

2.4 Demand and Needs Analysis

The need and demand for a more accessible, safe and functional bicycle, pedestrian and greenway system is paramount throughout Arlington. This is clearly demonstrated through fieldwork analysis, public input, demographic analyses, and user demand models. The service area and user demand analysis consider demographic characteristics, demand models of non-motorized travel, and public input.

Demand Analysis

A variety of demand models are often used to quantify usage of existing bicycle and pedestrian facilities, and to estimate potential usage of new facilities. The purpose of these models is to provide an overview of the potential demand for bicycling and walking in Arlington. As with all models, the results show a range of accuracy that can vary based on a number of assumptions and available data. The models used for this study have been used across the nation and incorporate information from existing publications as well as data from the U.S. Census. All data assumptions and sources are noted in the tables following each section of the analysis.

U.S. Census data provides a useful baseline for quantifying demand. Overall, across the State of Texas, walking and bicycling to work has decreased over the past 20 years. In the 1990 Census, the State of Texas experienced 0.2% of its population bicycling to work and 2.6% walking to work. In 2000, the percentages were 0.2% for bicycling and 1.9% for walking. In 2005-2007, the percentages were 0.2% again for bicycling and 1.8% for walking.

When focused solely on the City of Arlington, the pedestrian mode share has declined over the past couple decades. It was 1.7% in 1990; 1.6% in 2000; and 1.2% in 2005-2007. The bicycle mode share in 1990, 2000, and 2005-2007 was 0.2%. Combined bicycle and

pedestrian mode share was 2.1% in 1990 and 1.4% in 2000, with 2,345 walking or bicycling to work in 1990 and 1,648 doing the same in 2000. The 1990-2000 Census trend data is shown in the following table:

Sources:
1. US Census 1990
2. Census Transportation Package
http://ctpp.transportation.org/profiles_2005-2007/Part1_Profile1/Place/Part%201%20Profile%201_Arlington%20city,TX.xls
3. Census Transportation Package
http://ctpp.transportation.org/profiles_2005-2007/Part1_Profile1/State/Part%201%20Profile%201_Texas.xls

Table 2.1: City of Arlington Mode Share (2000 & 2005-2007)

City of Arlington 2000		
Total Workers:	172,355	100%
Drove alone	141,150	81.9%
Carpooled	21,585	12.3%
Bus or trolley bus	95	0.1%
Streetcar or trolley car	0	0.0%
Subway or elevated	50	0.0%
Railroad	55	0.0%
Ferryboat	0	0.0%
Taxicab	65	0.0%
Motorcycle	240	0.1%
Bicycle	**295**	**0.2%**
Walked	**2,760**	**1.6%**
Other Means	1,410	0.8%
Worked at Home	4,655	2.7%
City of Arlington 2005-2007		
Total:	175,525	
Drove alone	145,907	83.1%
Carpooled	19,400	11.0%
Bus or trolley bus	129	0.1%
Streetcar or trolley car	0	0.0%
Subway or elevated	59	0.0%
Railroad	288	0.2%
Ferryboat	0	0.0%
Taxicab	19	0.0%
Motorcycle	203	0.1%
Bicycle	**292**	**0.2%**
Walked	**2,034**	**1.2%**
Other Means	1,226	0.7%
Worked at Home	5,968	3.4%

Source: Census Transportation Package
http://ctpp.transportation.org/profiles_2005-2007/Part1_Profile1/Place/Part%201%20Profile%201_Arlington%20city,TX.xls

It is important to note that the Census and American Community Survey (ACS) data only counts trips to work, and does not capture Arlington's significant amount of travel to schools, other utilitarian travel, or recreation. The model in the following section uses Census data as a baseline, along with documented sources to incorporate the full range of bicycle and pedestrian mobility in Arlington.

Demand Models

The Arlington bicycle and pedestrian demand models consist of several variables including commuting patterns of working adults, and predicted travel behaviors of area college students and school children. For modeling purposes, the study area included all residents within the City of Arlington 2005-2007 (See following maps for population density). The information was ultimately aggregated to estimate the total existing demand for bicycle and pedestrian facilities in the city. Tables identify the variables used in the model. Data regarding the existing labor force (including number of workers and percentage of bicycle and pedestrian commuters) was obtained from the 2005-2007 U.S. Census American Community Survey (ACS). The 2005-2007 Census was also used to estimate the number of children in Arlington. This figure was combined with data from National Safe Routes to School surveys to estimate the proportion of children riding bicycles or walking to and from school. College students constituted a third variable in the model due to the presence of UT-Arlington. Data from the Federal Highway Administration regarding bicycle mode share in university communities was used to estimate the number of students bicycling to and from campus. It was assumed that 100% of college students are pedestrians at some point each day. Finally, data regarding non-commute trips was obtained from the 2001 National Household Transportation Survey to estimate bicycle and pedestrian trips not associated with traveling to and from school or work.

Existing Pedestrian Demand

Pedestrian demand can best be understood by knowing each person is a pedestrian at some point during their day. This can involve a walk through a parking lot or walk to a bus stop. The following table estimates daily pedestrian activity in Arlington. Potentially over 244,000 walking trips occur each day with non-commuting trips making up the majority of existing pedestrian demand.

Table 2.2: Aggregate Estimate of Existing Daily Pedestrian Activity in Arlington

Variable	*Figure*	*Calculations*
Employed Adults, 16 Years and Older		
a. Study Area Population (1)	356,764	
b. Employed Persons (2)	175,525	
c. Pedestrian Commute Percentage (2)	1.2%	
d. Pedestrian Commuters	2,034	(b*c)
School Children		
e. Population, ages 6-14 (3)	54,021	
f. Estimated School Pedestrian Commute Share (4)	11%	
g. School Pedestrian Commuters	5,942	(e*f)
College Students		
h. Full-Time College Students (5)	24,810	
i. Pedestrian Commute Percentage (6)	100%	
j. College Pedestrian Commuters	24,810	(h*i)
Work and School Commute Trips Sub-Total		
k. Daily Commuters Sub-Total	32,786	(d+g+j)
l. Daily Commute Trips Sub-Total	65,572	(k*2)
Other Utilitarian and Discretionary Trips		
m. Ratio of "Other" Trips in Relation to Commute Trips (7)	2.73	ratio
n. Estimated Non-Commute Trips	179,012	(l*m)
Total Estimated Pedestrian Trips	**244,584**	(l+n)

Notes:

Census data collected from 2005-2007 U.S. Census American Community Survey (ACS) for Arlington.

(1) 2005-2007 ACS
(2) 2005-2007 ACS
(3) 2005-2007 ACS
(4) Estimated share of school children who commute by bicycle or foot, as of 2000 (source: National Safe Routes to School Surveys, 2003).
(5) Source: Wikipedia for UT-Arlington.
(6) Assuming all college students are pedestrians at some point each day.
(7) 27% of all trips are commute trips (source: National Household Transportation Survey, 2001).

Existing Bicycle Demand

The following table summarizes estimated existing daily bicycle trips in Arlington. The table indicates that over 28,000 trips are potentially made on a daily basis. The model also shows that non-commuting trips comprise the vast majority of existing bicycle demand. The Plan was not built around this number of estimated trips, but it is a useful tool to illustrate potential existing demand.

Table 2.3: Aggregate Estimate of Existing Daily Bicycling Activity in Arlington

Variable	*Figure*	*Calculations*
Employed Adults, 16 Years and Older		
a. Study Area Population (1)	356,764	
b. Employed Persons (2)	175,525	
c. Bicycle Commute Percentage (2)	0.2%	
d. Bicycle Commuters	292	(b*c)
School Children		
e. Population, ages 6-14 (3)	54,021	
f. Estimated School Bicycle Commute Share (4)	2%	
g. School Bicycle Commuters	1,080	(e*f)
College Students		
h. Full-Time College Students (5)	24,810	
i. Bicycle Commute Percentage (6)	10%	
j. College Bicycle Commuters	2,481	(h*i)
Work and School Commute Trips Sub-Total		
k. Daily Commuters Sub-Total	3,853	(d+g+j)
l. Daily Commute Trips Sub-Total	7,706	(k*2)
Other Utilitarian and Discretionary Trips		
m. Ratio of "Other" Trips in Relation to Commute Trips (7)	2.73	ratio
n. Estimated Non-Commute Trips	21,037	(l*m)
Total Estimated Bicycle Trips	**28,743**	(l+n)

Above: Bicycles parked outside Arlington's Dunn Elementary School

Notes:

Census data collected from 2005-2007 U.S. Census American Community Survey (ACS) for Arlington.

(1) 2005-2007 ACS
(2) 2005-2007 ACS
(3) 2005-2007 ACS
(4) Estimated share of school children who commute by bicycle, as of 2000 (source: National Safe Routes to School Surveys, 2003).
(5) Source: Wikipedia for UT-Arlington.
(6) Review of bicycle commute share in 7 university communities (source: National Bicycling & Walking Study, FHWA, Case Study #1, 1995).
(7) 27% of all trips are commute trips (source: National Household Transportation Survey, 2001).

2.5 Demographic Analysis

The following analyses use 2000 census data. These maps and analyses should be updated when 2010 census data becomes available.

Through analyses of demographic information, user need and demand can be better understood. Regardless of the availability or condition of existing bicycle and pedestrian facilities, a number of residents walk throughout Arlington to destinations such as work, shopping centers, parks, and neighbors' homes. During fieldwork, pedestrians and bicyclists were observed throughout different areas of Arlington. US Census demographic data provides geographic information regarding the means of transportation to work and percent of population not owning a vehicle.

Vehicle Ownership (Map 2.4)

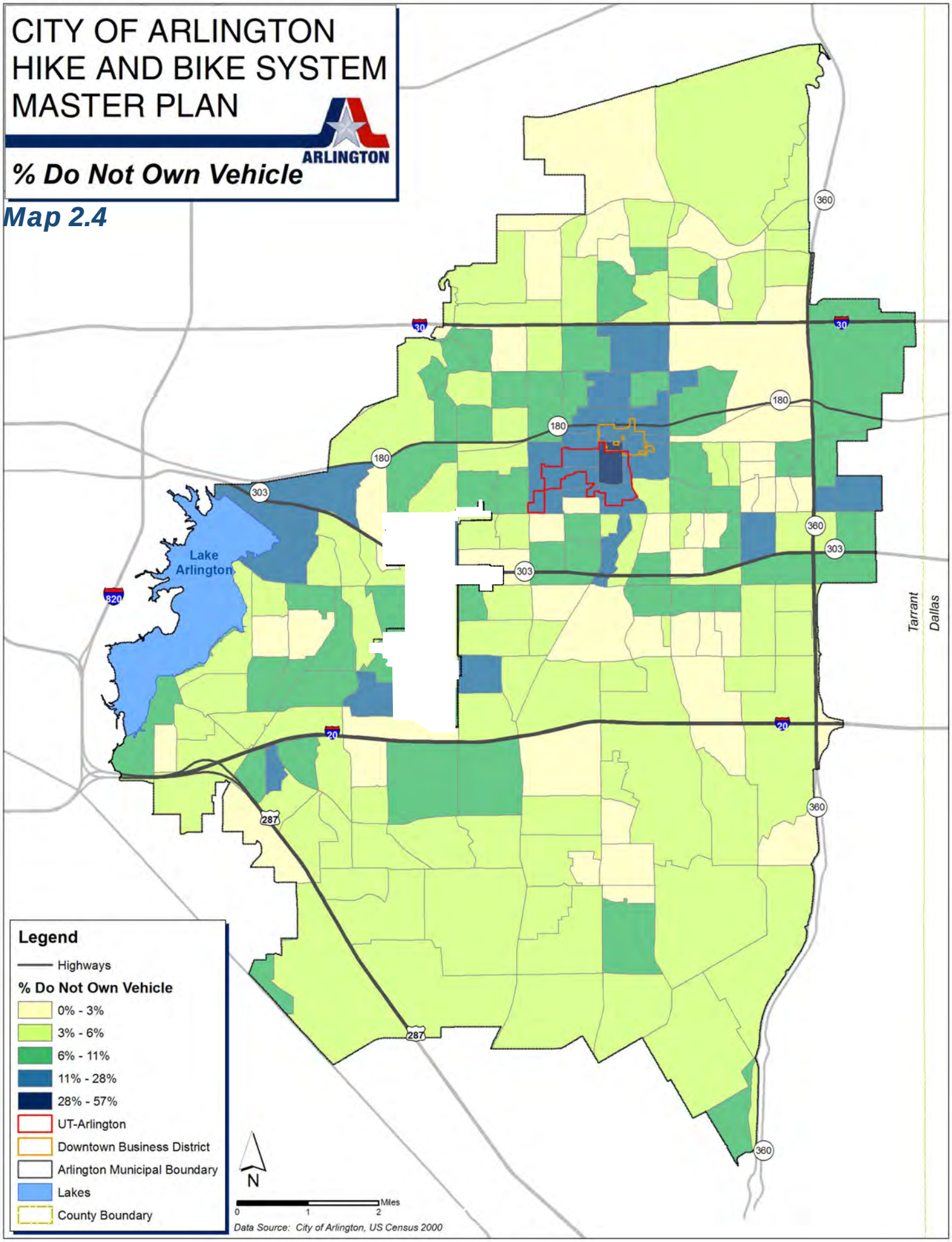
When considering the City of Arlington as a whole, 5.6% of the working population did not own a vehicle in 2000. A more detailed geographic investigation of US census data provides a further understanding of need. Map 2.4 (% Not Owning a Vehicle by Block Group) presents a geographic view of the percentage of workers that do not own a vehicle and would thus be more dependent on alternative means of transportation. The darker shades of green and blue show block group areas where higher percentages of the working population do not own a vehicle. The highest percentages are found within the Downtown core and UT-Arlington area and range between 12-57%. Overall, the area contained by I-30 and Hwy 303 contains some of the highest percentages per block group in the City.

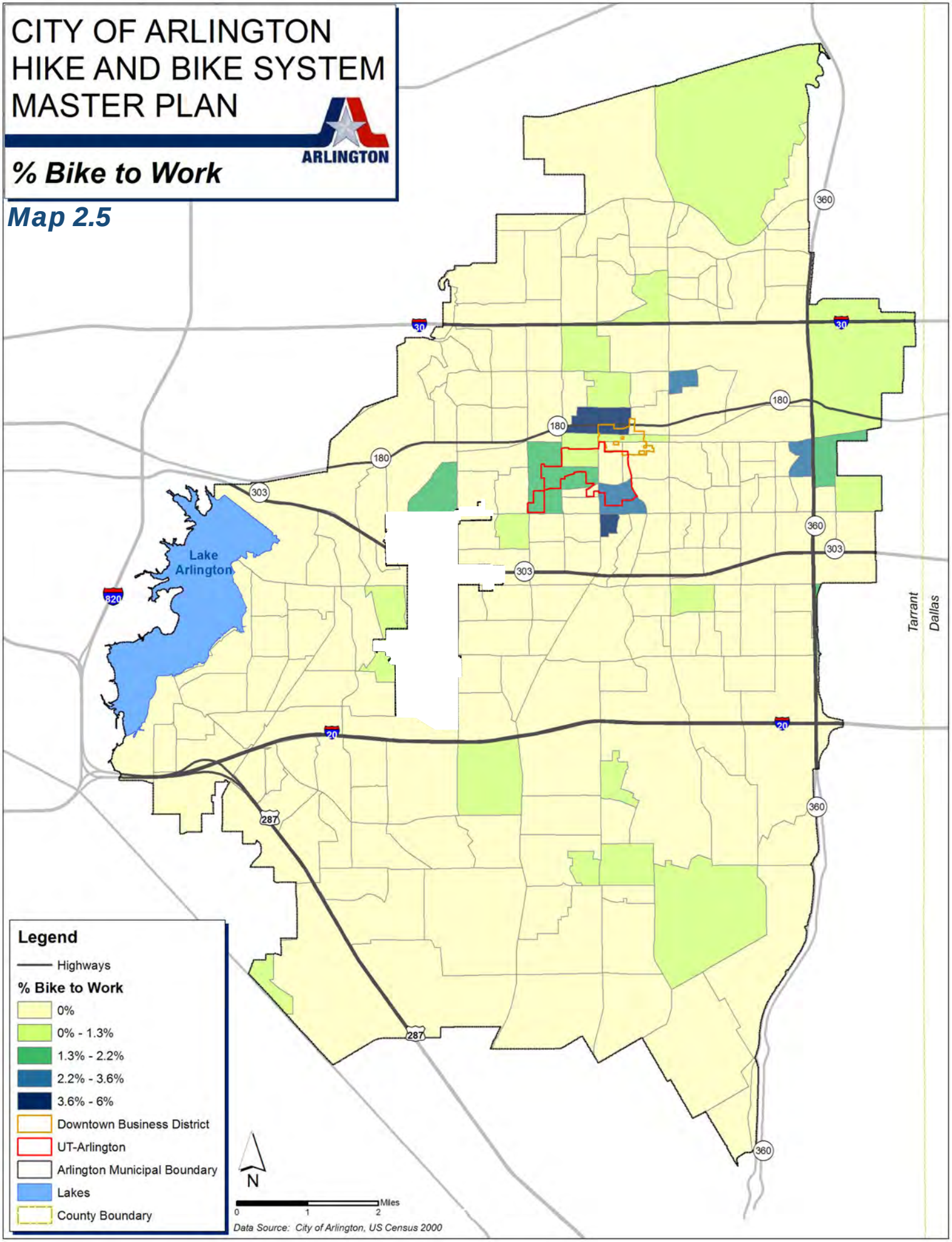
Bicycle and Pedestrian Mode Share (Maps 2.5 and 2.6)

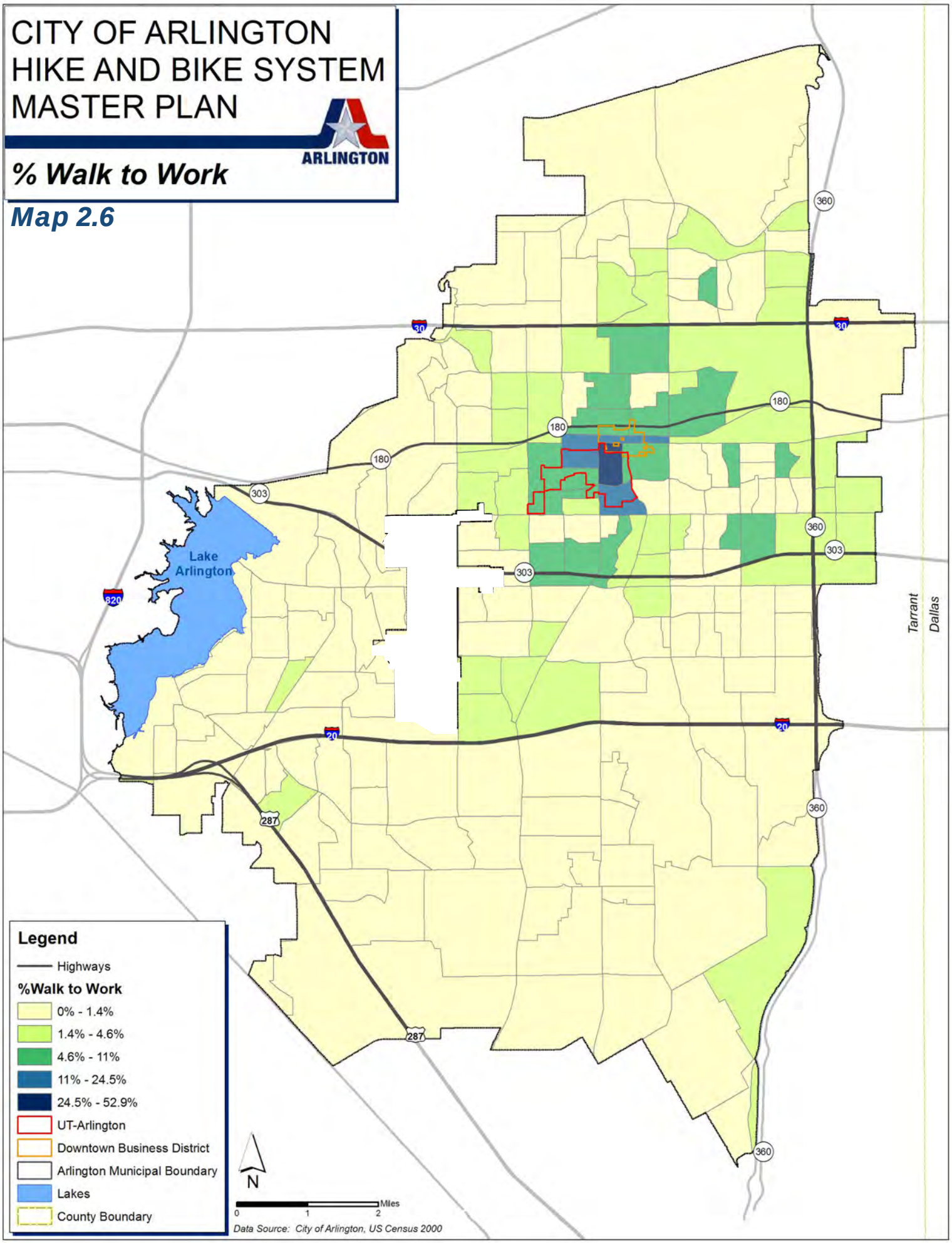
The City of Arlington Percent Working Population Biking and Walking to Work maps (Maps 2.5 and 2.6) present a geographic view of the percentage of pedestrian and bicycle commuters by block group. The darker shades of green and blue show areas in which higher numbers of people are already walking or biking to work.

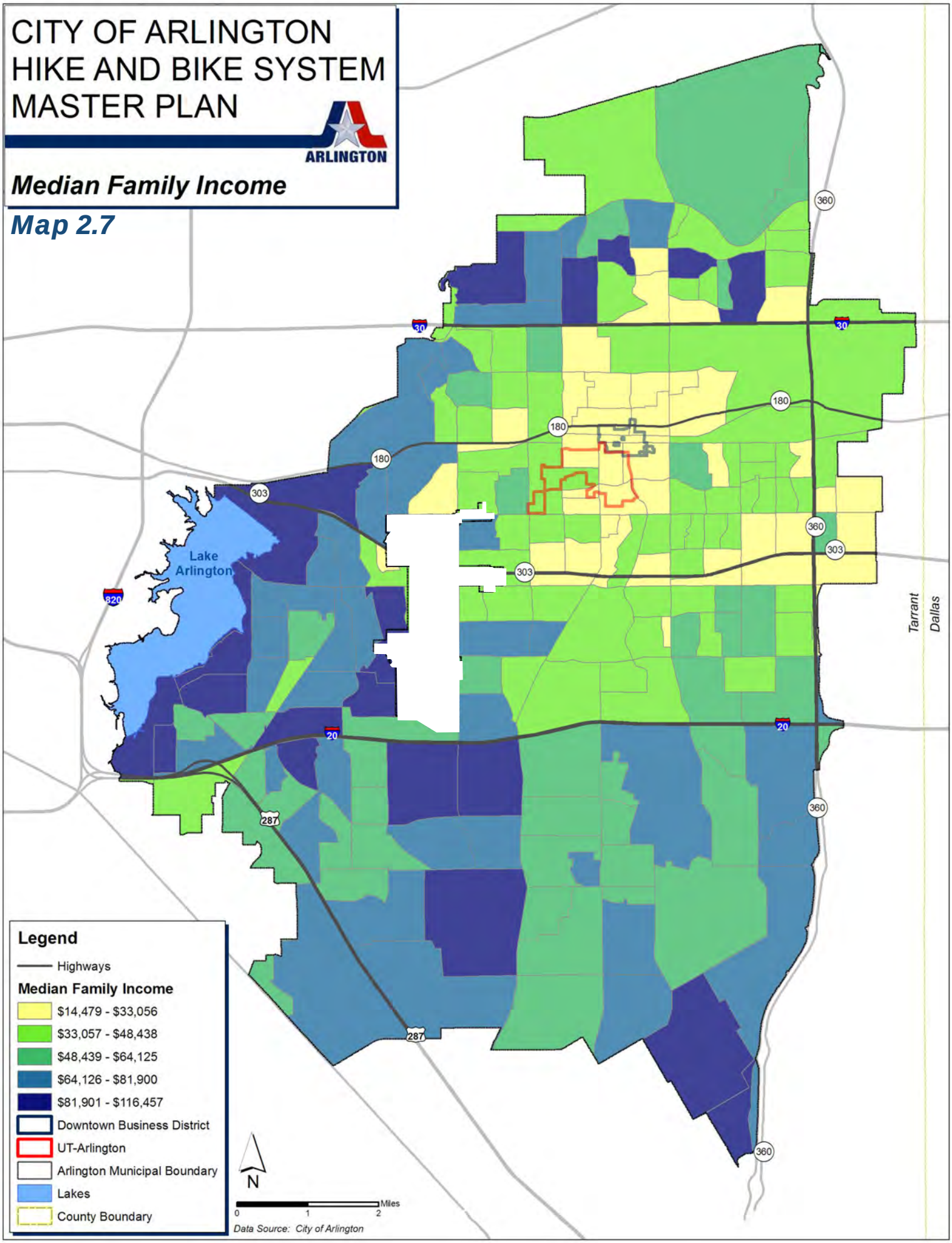
The highest percentages of those walking to work are confined to the Downtown/UT-Arlington area. Anywhere between 5-53% of workers walk to work in the Downtown. Other pockets of relatively high walking commuters can be found between the I-30 and Hwy 303 corridor, mainly in central to eastern Arlington.

The higher percentages of those biking to work are more geographically sporadic. Still, the highest block group percentages are found mostly in the immediate Downtown and UT-Arlington area.


CITY OF ARLINGTON
HIKE AND BIKE SYSTEM
MASTER PLAN
ARLINGTON
% Do Not Own Vehicle
Map 2.4
Lake Arlington
Tarrant
Dallas
Legend
Highways
% Do Not Own Vehicle
0% - 3%
3% - 6%
6% - 11%
11% - 28%
28% - 57%
UT-Arlington
Downtown Business District
Arlington Municipal Boundary
Lakes
County Boundary
N
Miles
0
1
2
Data Source: City of Arlington, US Census 2000


CITY OF ARLINGTON
HIKE AND BIKE SYSTEM
MASTER PLAN
ARLINGTON
% Bike to Work
Map 2.5
Lake Arlington
Tarrant
Dallas
Legend
Highways
% Bike to Work
0%
0% - 1.3%
1.3% - 2.2%
2.2% - 3.6%
3.6% - 6%
Downtown Business District
UT-Arlington
Arlington Municipal Boundary
Lakes
County Boundary
N
Miles
0
1
2
Data Source: City of Arlington, US Census 2000


CITY OF ARLINGTON
HIKE AND BIKE SYSTEM
MASTER PLAN
ARLINGTON
% Walk to Work
Map 2.6
Lake Arlington
Tarrant
Dallas
Legend
Highways
%Walk to Work
0% - 1.4%
1.4% - 4.6%
4.6% - 11%
11% - 24.5%
24.5% - 52.9%
UT-Arlington
Downtown Business District
Arlington Municipal Boundary
Lakes
County Boundary
N
Miles
0
1
2
Data Source: City of Arlington, US Census 2000


CITY OF ARLINGTON
HIKE AND BIKE SYSTEM
MASTER PLAN
ARLINGTON
Median Family Income
Map 2.7
Lake Arlington
Tarrant
Dallas
Legend
Highways
Median Family Income
$14,479 - $33,056
$33,057 - $48,438
$48,439 - $64,125
$64,126 - $81,900
$81,901 - $116,457
Downtown Business District
UT-Arlington
Arlington Municipal Boundary
Lakes
County Boundary
N
Miles
0
1
2
Data Source: City of Arlington

Median Family Income (Map 2.7)
The Arlington Median Family Income map (Map 2.7) presents income levels at the block group level. While this isn't a direct representation of bicycle and pedestrian use, it does indicate higher potential need for walkable and bikable spaces. As gas prices rise in the future, there may be increased need for bicycle and pedestrian travel, especially among lower-income groups. Lower-income areas are most commonly found between I-30 and Hwy 303, in and around Downtown, and east of Downtown.

2.6 Existing Plan Summaries

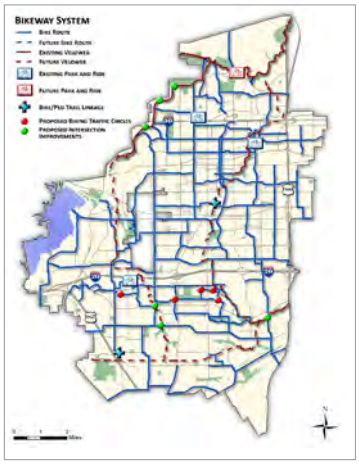
There are a number of relevant planning documents and ordinances both locally and regionally. While these documents address some bicycle and pedestrian elements and requirements, there is still significant need to enhance these components to make Arlington grow in a more bicycle and pedestrian friendly manner.

For summaries of the City of Arlington Zoning Ordinance, Subdivision Regulations, Design Criteria Manual, and Comprehensive Plan, please refer to Chapter 6: Hike & Bike Policies.

Mobility 2030 Plan (2007-2009)
The North Central Texas Council of Governments' Mobility 2030 Plan establishes policies and priorities for the multi-modal transportation system for the North Texas region. This Plan sets forth many goals to improve the bicycle and pedestrian transportation systems and recommends 286 miles of new bicycle and pedestrian routes in the Dallas-Fort Worth area. Section 15 of the Mobility 2030 Plan, the Pedestrian/Bicycle System, provides the following goals to improve these modes of transportation:

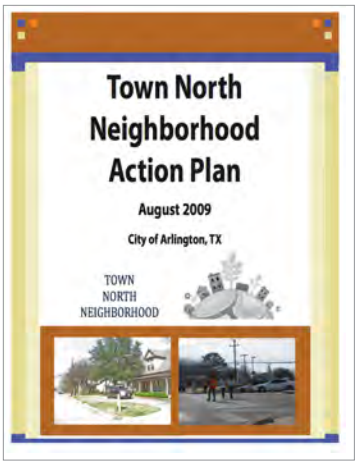
- Improving safety and mobility for current trips made solely by non-motorized alternative means or which access transit by non-motorized means;
- Increasing the service area of bicycle and pedestrian facilities in order to increase the share of trips taken solely by non-motorized means; and
- Making further progress toward the regional commuting goal of an eight percent combined alternative transportation mode share.

This section thoroughly examines existing conditions, needed facilities and policies, and different facility type recommendations for the region. The Arlington Hike and Bike System Master Plan will compliment this Mobility 2030 Plan and will build upon it in detail for the City of Arlington.



Arlington Bikeway System Plan (and Map)
The City of Arlington generated a citywide comprehensive bikeway system map that identified mapped corridors for bike routes, Veloweb trails, trail linkages, and proposed intersection improvements. This map served as a starting point for recommendations made in the Hike and Bike Master Plan.

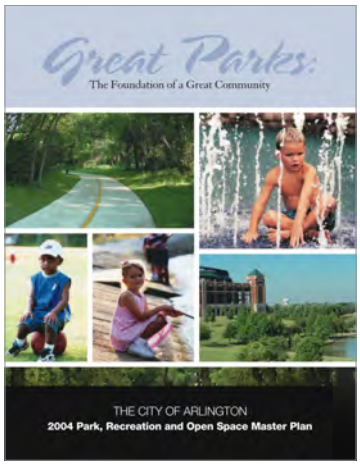
Town North Neighborhood Action Plan (2009)
This Plan details goals and policies for the neighborhood of Town North in Arlington. The Plan offers guidance and recommendations on how this neighborhood wants to continue to develop while maintaining its current character. These recommendations include goals for improving traffic, bicycle safety, and neighborhood appeal. Traffic calming measures on several streets are recommended as well as specific programs to improve bicyclist's safety within the neighborhood. These recommendations are integral within the Arlington Bicycle and Pedestrian Master Plan.



South Davis Neighbors-A Neighborhood Action Plan (2002)
While this Plan is dated, it still has relevance to planning within this small area of Arlington. The South Davis Neighborhood Action Plan highlights specific goals and polices that this area set forth to guide future development and existing conditions. Within these recommendations are several mentions of pedestrians and safety. This Plan recommends traffic calming measures on several streets and a connected sidewalk system throughout the neighborhood to improve pedestrian safety. These recommendations are relevant for the Arlington Hike and Bike System Master Plan.

Historic North Central Community Neighborhood Action Plan (2002)
This Plan set forth a blueprint for this historic neighborhood within Arlington. The Plan addresses the need to protect the assets of the neighborhood and recommends ways to meet the identified needs through long-term goals. Within these goals are recommendations to improve pedestrian safety and traffic calming throughout the neighborhood.

Park, Recreation, and Open Space Master Plan (2004)
In 2004 the City of Arlington Parks, Recreation, and Open Space Master Plan was developed to assess the current conditions and provide recommendations for improvement for the many parks within the City. This Plan realizes the importance of bicyclists and pedestrians to parks and the surrounding neighborhoods. A few excerpts from this Plan:



> *"It is the policy of the Arlington Parks and Recreation Department* to actively promote pedestrian and non-vehicular linkages between parks, neighborhoods, and commercial centers throughout the city. The Department will place a strong emphasis on linear park acquisition and development, continued development of the Veloweb (a regional trail system) and pedestrian improvements to and from commercial centers, schools and neighborhoods."
>
> "Emphasize linear park acquisition and development. These

parks are settings for popular and easily accessible recreation opportunities, and they preserve critically important floodways and wildlife habitat."

"Improve accessibility to parks for all citizens."

"Making our parks and park facilities accessible means looking for opportunities to develop pedestrian connections to schools, neighborhoods and commercial activity centers."

Downtown Arlington Master Plan (2004)

The Downtown Plan helps to establish a vision and future for the center city area by identifying challenges and opportunities to revitalizing the downtown area as it once was. Interwoven throughout this Plan are recommendations for a better pedestrian and bicycle network to encourage and promote these methods of travel while enhancing the downtown area. Below are some of these goals:

"Create a community with multi-modal mobility that encourages pedestrians, bicycles, automobiles, and some form of public and/or private transportation."

"Create a community of neighborhoods with easy pedestrian access to a system of parks, open spaces, trails and gathering places promoting interactions within and among neighborhoods."

"Encourage and promote areas that advocate for pedestrian design and amenities."

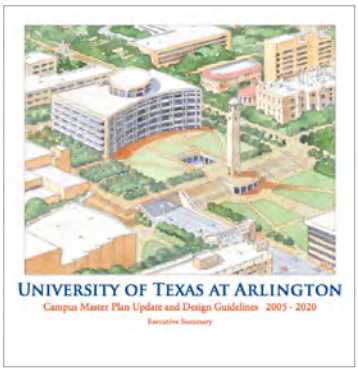
Additional excerpts in support of bicycling and walking:

"Encourage walking. An excellent way to encourage customers to use one parking space while visiting several businesses is to encourage walking. One way to do this is by improving site design and architecture to make walking a pleasant, safe experience."

UT-Arlington Campus Master Plan (2007)

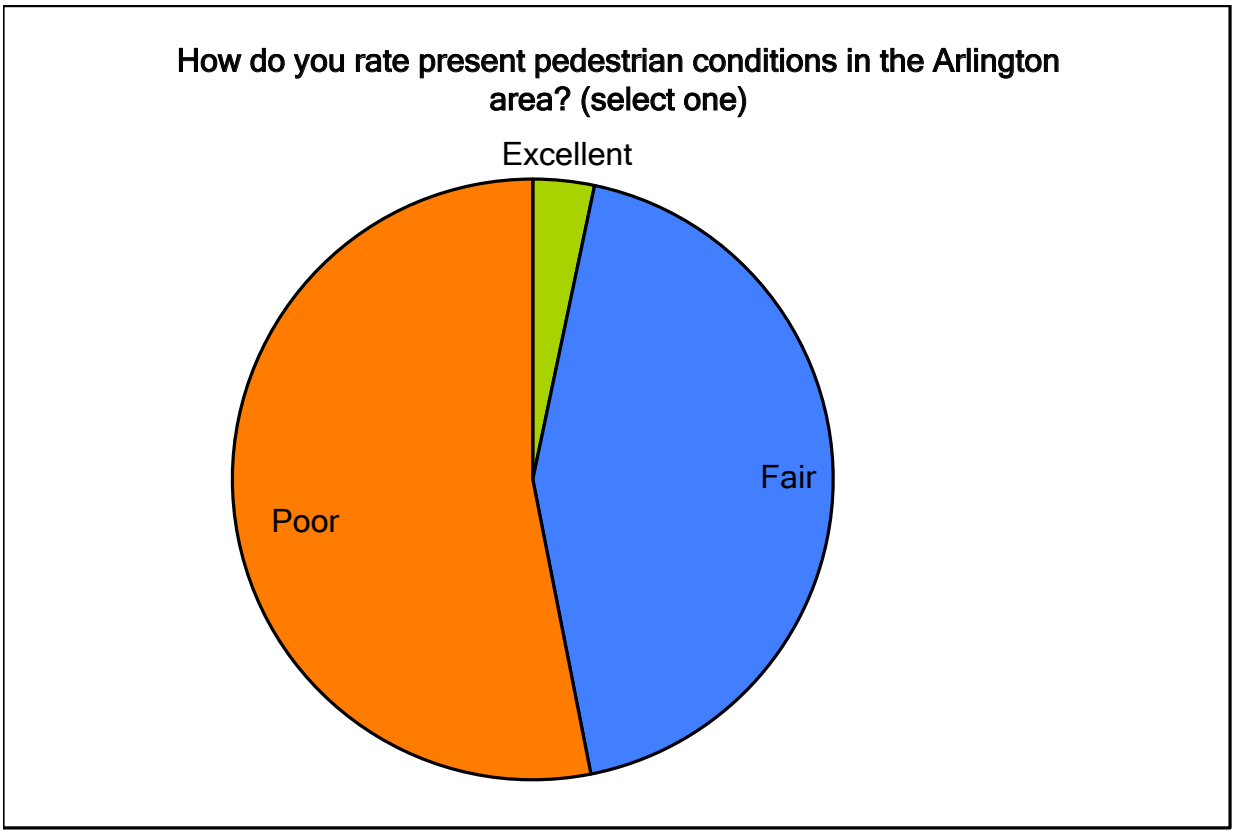
The UT-Arlington Campus Master Plan promotes walking and biking connectivity with the Downtown and within the campus. As part of its conceptual design, it emphasizes the importance of sidewalks on all streets with shade trees along the routes. It also recommends the development of bikeways on campus to complement the enhancement of pedestrian amenities. Campus streets would be improved and reconfigured to include bike lanes and wider sidewalks. Some specific design recommendations include:

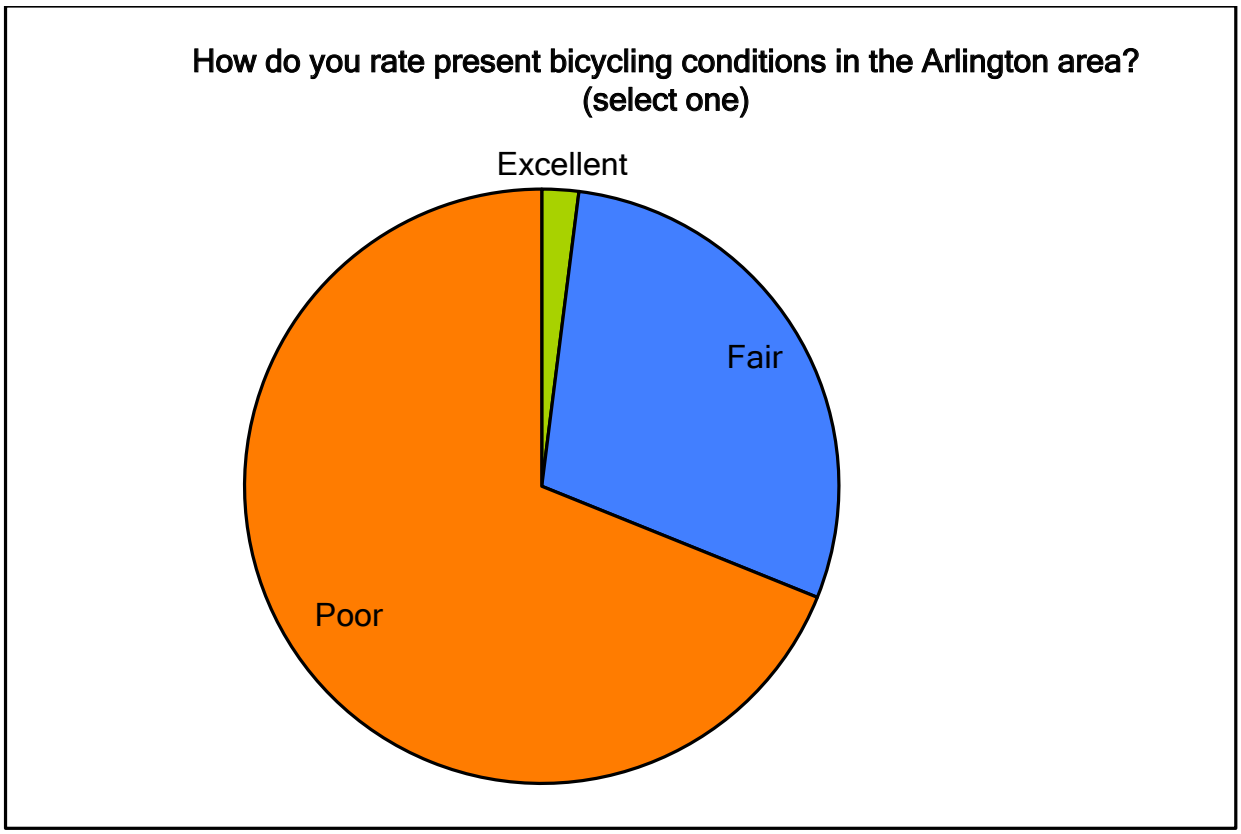
- Cooper and Abram – Becomes a gateway into the campus with mixed-use and walkable spaces around.
- Pedestrian Bridge over Cooper – Improvements are made to the pedestrian bridge to increase the image and visibility of the campus from Cooper Street.
- South Oak Street/Secondary Streets – These roads are closed on campus providing a shaded network of sidewalks for pedestrians.
- Southern Gateway – Cooper Street and Nedderman Drive becomes a gateway that slows traffic and creates space for pedestrians.

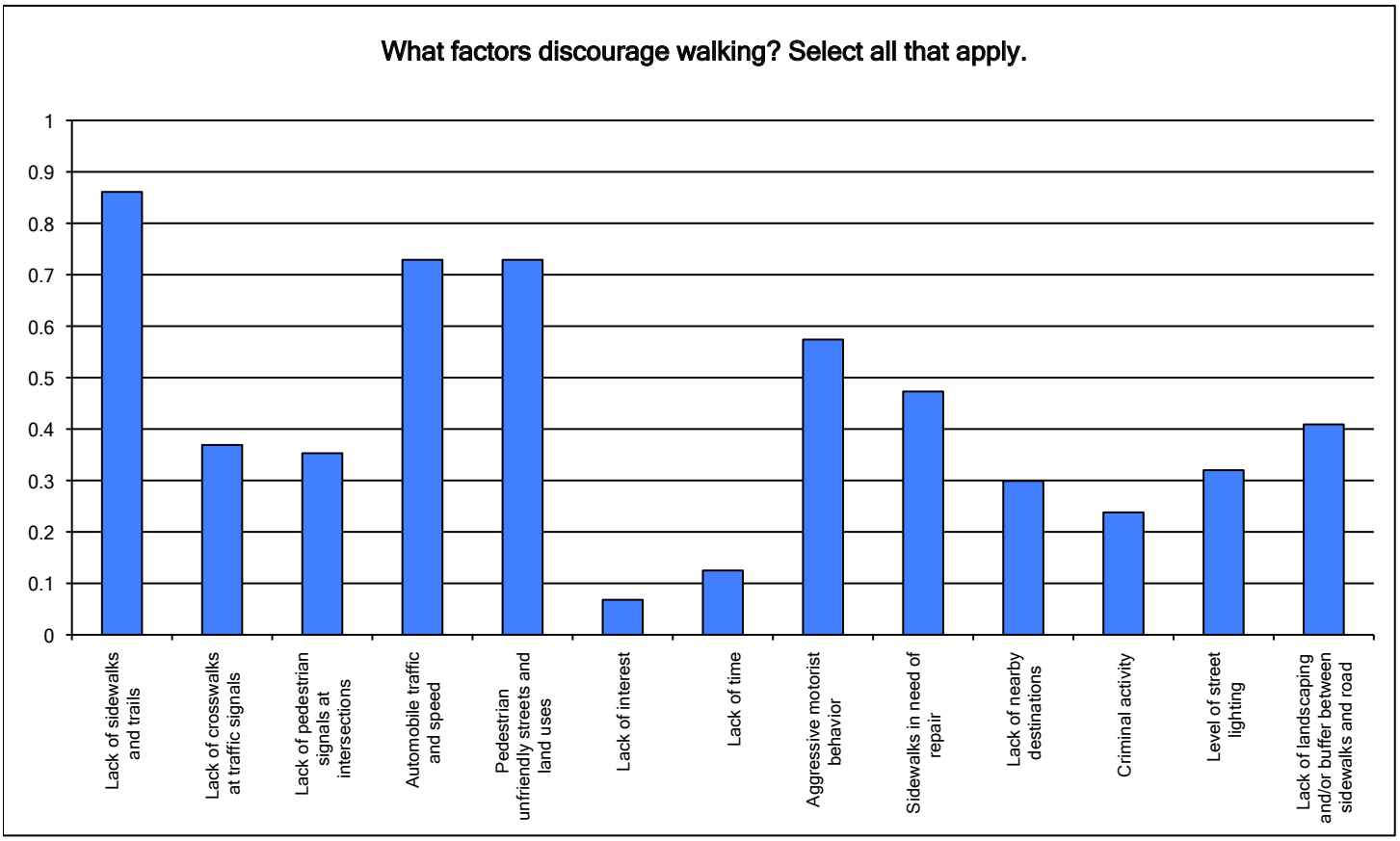


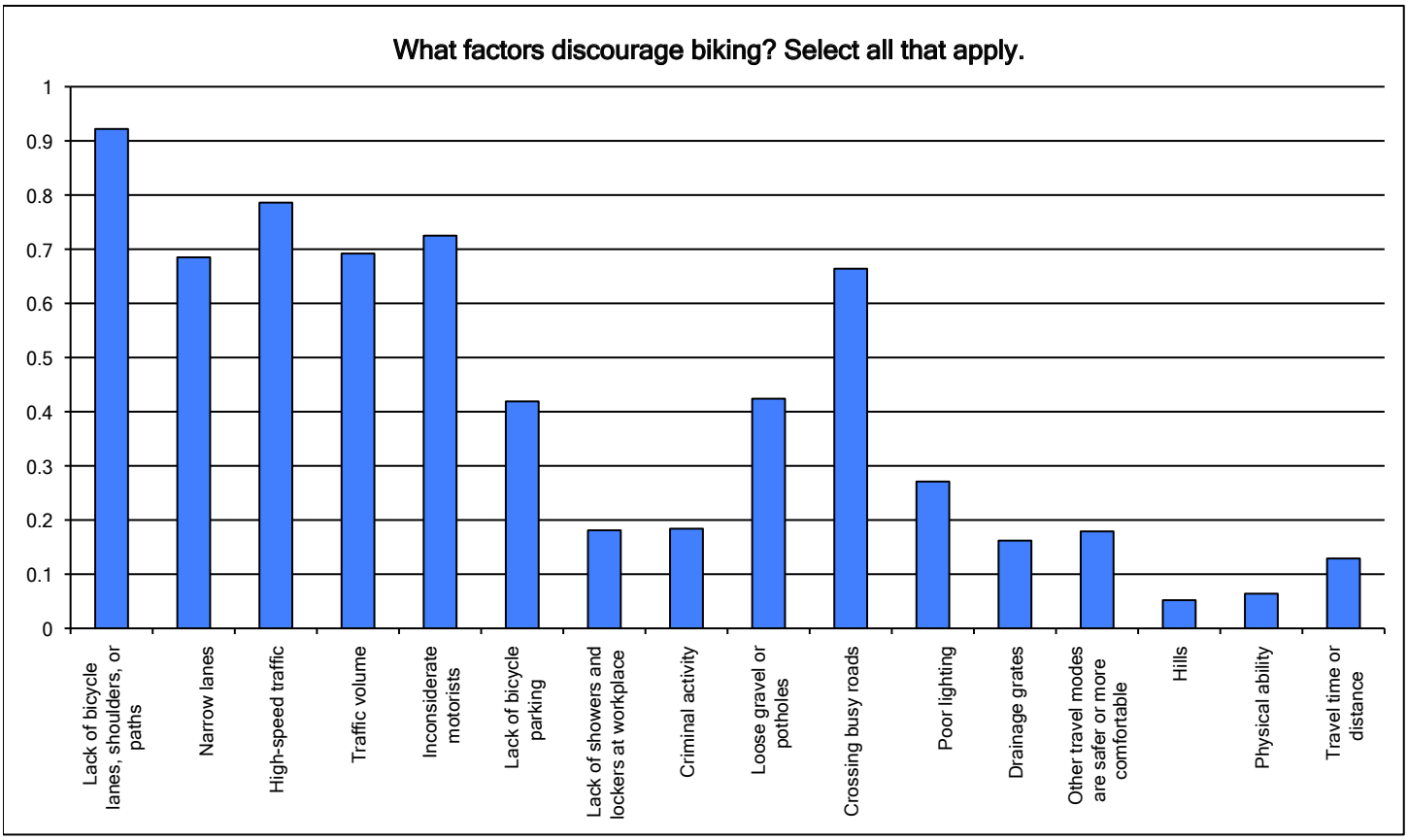
2.7 Public Input

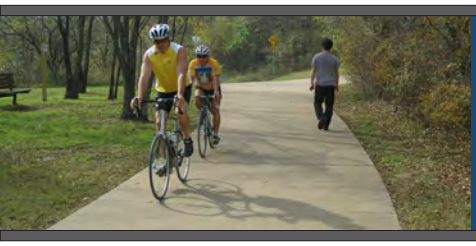
Another expression of need and demand comes from public involvement throughout the Hike & Bike planning process. Public input was gathered through several means, including Steering Committee meetings, public workshops, and a comment form (made available online and through distribution). Four hundred fifty-eight people completed the comment form. For the full report, see Appendix A. Key results are shown below:




How do you rate present bicycling conditions in the Arlington area? (select one)
Excellent
Fair
Poor


What factors discourage walking? Select all that apply.
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Lack of sidewalks and trails
Lack of crosswalks at traffic signals
Lack of pedestrian signals at intersections
Automobile traffic and speed
Pedestrian unfriendly streets and land uses
Lack of interest
Lack of time
Aggressive motorist behavior
Sidewalks in need of repair
Lack of nearby destinations
Criminal activity
Level of street lighting
Lack of landscaping and/or buffer between sidewalks and road


What factors discourage biking? Select all that apply.
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Lack of bicycle lanes, shoulders, or paths
Narrow lanes
High-speed traffic
Traffic volume
Inconsiderate motorists
Lack of bicycle parking
Lack of showers and lockers at workplace
Criminal activity
Loose gravel or potholes
Crossing busy roads
Poor lighting
Drainage grates
Other travel modes are safer or more comfortable
Hills
Physical ability
Travel time or distance



3. BIKE NETWORK

Chapter Contents

3.0 Overview

3.1 Recommended Facility Types

3.2 Methodology for Bike System Design

3.3 Arlington Thoroughfare Development Plan

3.4 Bike System Breakdown

3.5 Bike System Priority Projects

3.6 End-of-trip Facilities

3.7 Regional Connectivity

3.8 Bike Network Map

3.9 Bicycle Treatment Photo Visualizations

3.0 Overview

Arlington's Bike System represents a comprehensive set of existing and proposed bicycle transportation and recreation facilities. The network includes on-road and off-road facilities such as bicycle lanes and trails. In total, there are approximately 138 miles of bicycle recommendations, all of which are shown in Map 3.1. Appendix G displays tiled recommendation maps for easier interpretation.

The following sections of this chapter include 1) descriptions of the types of facilities and treatments that make up the system; 2) how the network was designed (methodology); 3) incorporation of Thoroughfare Development Plan; 4) City of Arlington overall system breakdown; 5) priority projects and maps; 6) end-of-trip facilities and 7) regional connectivity.

3.1 Recommended Facility Types

A variety of bicycle facilities are recommended due to 1) the range of skill and comfort levels involved in bicycling, and 2) the range of existing conditions for bicycling in different landscapes and on different roadway environments. These recommendations are at a planning level only and will require further analysis before implementation.

The recommended bicycle system is made up of three major types of facilities (separated in-roadway bikeways, shared roadway bikeways, and off-road bikeways). Within each type are multiple facility options that are tailor-recommended for specific segments of the overall system. Descriptions and standards for each type are described in Chapter 7: Design Guidelines. The images and descriptions below are provided for a quick reference when viewing the Bicycle Facility System Maps at the end of this chapter.

3.1.1 Separated in-roadway bikeways

Separated in-roadway bikeways are used typically on arterial and collector roadways where motor vehicle traffic volumes or speeds are higher than residential roads. They include:

Bicycle Lane

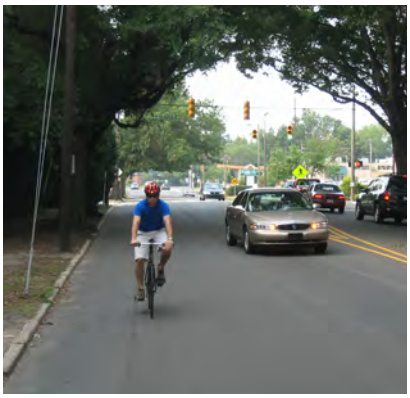
A bicycle lane is a portion of the roadway that has been

designated by striping, signage, and pavement markings for the preferential and exclusive use of bicyclists. Bicycle lanes are always located on both sides of the road (except one way streets), and carry bicyclists in the same direction as adjacent motor vehicle traffic. The minimum, acceptable width for a bicycle lane is 5 feet; 6 foot bike lanes are typical for collector and arterial roads.

Above: example bicycle lane.

Wide Outside Lane

A wide outside lane refers to the through lane closest to the curb and gutter of a roadway. According to the American Association of State Highway and Transportation Officials (AASHTO), the standard lane width to accommodate both motorists and bicyclists is 14 feet. This facility type allows motorists to more safely pass slower moving bicyclists without changing lanes. Wide outside lanes are intended for bicyclists with traffic-handling skills.



Above: example wide outside lane.

Paved Shoulders

Paved shoulders are the part of a roadway which is contiguous and on the same level as the regularly traveled portion of the roadway. There is no minimum width for paved shoulders, however a width of at least 4 feet is preferred. Ideally, paved shoulders should be included in the construction of new roadways and/or the upgrade of existing roadways, especially where there is a need to more safely accommodate bicycles. Paved shoulders are typically recommended on rural roadways. However, if future development occurs, roadways are reconstructed, and/or curb and gutter are added in the future, bicycle lanes should be considered as a replacement for paved shoulders.

Above: example paved shoulder

Implementing Separated In-roadway Bikeways:

Separated in-roadway facilities may be constructed through stand-alone bikeway projects, roadway reconstruction, new roadway construction, or routine roadway resurfacing. On existing roadways, separated in-roadway facilities may also be implemented by one of four strategies – restriping (narrowing existing travel lanes), travel lane conversions (removing travel lanes), striping (simply adding striping), or roadway reconstruction (widening the roadway to create space for separated facilities).

Such strategies can be implemented only after consideration of impacts to all modes, including observation and forecasting of motor vehicle and bicycle volumes and parking utilization. Where there are competing demands for roadway space, policy and analysis inform how these demands are managed and met. Unless prohibited with "no parking" signage, parking is allowed in bike lanes in Arlington. Existing parking on residential streets will not be prohibited due to the addition of bicycle lanes.

Implementation Methods for Bicycle Lanes
(System Map Subcategory Definitions)

As indicated in the legend of the bicycle network maps in Appendix G, some facilities are broken down into sub-categories for method of development. Those for bicycle lanes are explained below:

Bicycle Lane - Travel Lane Conversion:
Travel lane conversions typically involve reducing the number of travel lanes (from a four lane road to a two lane road with center turn lane, for example) allowing adequate space for bicycle lanes. Travel lane conversions also have traffic calming benefits. These projects can occur during roadway resurfacing projects.

Bicycle Lane - Stripe:
Refers to projects that require only the striping of a bicycle lane, with no other changes needed to the roadway or existing roadway striping.

Bicycle Lane - Restripe:
Refers to projects that require restriping travel lanes (often to a more narrow width) allowing adequate space for bicycle lanes. Narrowing the widths of travel lanes has been demonstrated to have no affect on overall roadway capacity (for more on this topic, refer to the following section on 'lane narrowing'). These projects can occur during roadway resurfacing projects.

Bicycle Lane - New Construction & Paved Shoulder – New Construction:
Refers to projects that require adding additional pavement width to the roadway to allow adequate space for bicycle lanes or shoulders. It is likely that these bicycle facilities will be implemented to coincide with future roadway construction projects.

BICYCLE LANE DEVELOPMENT & TRAVEL LANE NARROWING (RESTRIPING):

Narrowing roadways for traffic calming purposes and bicycle facilities are common occurrences since planners and engineers are trying to not only accommodate vehicles, but bicyclists and pedestrians as well. Narrowing roadways to allow for bicycle lanes or other bicycle facilities is needed in some instances where current roadway widths and traffic volume do not allow for the simple "striping" (painting) of a bicycle lane.

One means of developing bicycle lanes is through restriping or travel lane narrowing. In laying out the bicycle network recommendations and methods, it was determined that 10 foot travel lanes were acceptable in order to fit bicycle lanes into the existing roadway environment. For example, an existing five lane cross section with 12-foot lanes (Total roadway width of 60 feet) could be altered to 10-foot lanes with 5-foot bicycle lanes (Total roadway width of 60 feet). This methodology used in developing recommendations is supported by research in both automobile traffic safety and bicycle level of service improvements.

Current AASHTO literature, research, and precedent examples (including some found in Arlington) support the notion of reducing travel lanes to 10 foot lanes. The 2004 AASHTO Green Book states that travel lanes between 10 and 12 feet are adequate for urban collectors and urban arterials. (1) "On interrupted-flow operating conditions (where traffic flow experiences regular interruptions due to traffic signs and signals) at low speeds (45 mph or less), narrow lane widths are normally adequate and have some advantages." At the 2007 TRB Annual Meeting, a research paper using advanced statistical analysis, supported the AASHTO Green Book in providing flexibility for use of lane widths narrower than 12 feet on urban and suburban arterials. The paper indicates there is no difference in safety on streets with lanes ranging from 10 to 12 feet. "The research found no general indication that the use of lanes narrower than 12 feet on urban and suburban arterials increases crash frequencies. This finding suggests that geometric design policies should provide substantial flexibility for use of lane widths narrower than 12 feet." The research paper goes on to say "There are situations in which use of narrower lanes may provide benefits in traffic operations, pedestrian safety, and/or reduced interference with surrounding development, and may provide space for geometric features that enhance safety such as medians or turn lanes. The analysis results indicate narrow lanes can generally be used to obtain these benefits without compromising safety." and "Use of narrower lanes in appropriate locations can provide other benefits to users and the surrounding community including shorter pedestrian crossing distances and space for additional through lanes, auxiliary and turning lanes, bicycle lanes, buffer areas between travel lanes and sidewalks, and placement of roadside hardware." (2)

Precedent examples also show the large number of communities around the United States that have narrowed travel lanes to enable the development of bicycle lanes. The Missoula Institute for Sustainable Transportation accumulated a list of these communities through information provided by members of the Association of Pedestrian and Bicycle Professionals. The webpage titled "Accommodating Bike Lanes in Constrained Rights-of-Way (www.strans.org/travellanessurvey.htm) lists the community, their methods, and contact information. Cities such as Arlington, VA, Cincinnati, OH, Charlotte, NC, Houston, TX, and Portland, OR have regularly narrowed travel lanes to 10 foot and many commonly use them in new roadway development. Arlington, VA has been installing bicycle lanes on streets when they are repaved and have a number of streets with 10 foot lanes and bicycle lanes that have been functioning well without operational issues and complaints. Cincinnati, OH uses a policy that 10 foot lanes on collectors and arterials are always permitted. New installations of 10 foot travel lanes with bicycle lanes require a

speed limit of 35 mph or under. By restriping 12 foot lanes to 10 feet, the City of Houston, TX has converted 30 miles of arterial streets.

Lane narrowing and the addition of bicycle lanes will require consultation with TxDOT and further analysis beyond this planning effort. Changing the roadway design may also require a reduction in speed limit and consideration of traffic calming designs such as median islands. For roadways with higher speed limits and traffic volumes, wider vehicular and bicycle lanes may be warranted. Further analysis of bicycle lane restriping projects is warranted to determine appropriateness of lane narrowing, bicycle lane widths, and speed limits that impact both motorists and bicyclists.

Sources for Bicycle Lane Development & Travel Lane Narrowing:

1) American Association of State Highway and Transportation Officials, A Policy on Geometric Design of Highways and Streets, Washington, DC 2004.
2) Relationship of Lane Width to Safety for Urban and Suburban Arterials, Ingrid B. Potts, Harwood, D., Richard, K, TRB 2007 Annual Meeting

BICYCLE LANE DEVELOPMENT THROUGH TRAVEL LANE CONVERSIONS

A travel lane conversion (TLC) (also known as a road diet) is a type of roadway conversion project where travel lanes are removed from a roadway and the space is utilized for other uses and travel modes. Often, TLCs are conversions of four lane undivided roads into three lanes (two through lanes and a center turn lane). Many roadways have been overbuilt to keep pace with increases in automobile travel, but some roadways actually perform worse with the additional lanes. A TLC solves this problem by removing unneeded lanes to reallocate space for other needs such as pedestrian paths, bicycle lanes, or transit facilities. When tested, TLCs typically have minimal effects on vehicle capacity, because left-turning vehicles are moved into a common two-way left-turn lane.

Travel lane conversions have other benefits beyond improving the bicycling environment of a street. According to the Road Diet Handbook: Setting Trends for Livable Streets, "the resulting benefits [of a road diet] include reduced vehicle speeds; improved mobility and access; reduced collisions and injuries; and improved livability and quality of life" (Rosales, 2006, p.3). A TLC also provides benefits to pedestrians as they may reduce vehicle speeds (calm traffic), create opportunities for median refuge islands, and create a situation where there are fewer lanes to cross. The FHWA report Safety Effects of Marked vs. Unmarked Crosswalks at Uncontrolled Locations found that pedestrian crash risk was reduced when pedestrians crossed two and three lane roads compared to roads with four lanes or more.

TRAVEL LANE CONVERSION GUIDELINES

Burden and Lagerway summarize the street and location criteria that can be used to identify potential candidates for travel lane conversions:

- Moderate volumes (typically 8,000–15,000 ADT)
- Roads with safety issues
- Transit corridors
- Popular or essential bicycle routes/links
- Commercial reinvestment areas
- Economic enterprise zones
- Historic streets
- Scenic roads
- Entertainment districts
- Main streets

Potential travel lane conversion projects should be evaluated on a case-by-case basis with a focus largely on the existing and intended function of the roadway in terms of predicted traffic volumes and flow, turning volumes and patterns, crash type and patterns, bicycle and pedestrian activity, and presence of parallel routes.

Further information may be found in Chapter 7: Design Guidelines.

Resources:

Summary Report: Evaluation of Lane Reduction "Road Diet" Measures and Their Effects on Crashes and Injuries. (http://www.tfhrc.gov/safety/hsis/pubs/04082/index.htm).

Burden, D., and P. Lagerwey, Road Diets: Fixing the Big Roads, Walkable Communities, Inc., March 1999, available online at http://www.contextsensitivesolutions.org/content/reading/road-diets-3/resources/road-diets-fixing/.

Above: examples of a travel lane conversion for a bicycle lane

3.1.2. Shared Roadway Bikeways

Shared roadway bikeways are intended to be implemented on lower volume roadways than separated in-roadway facilities. Each type of shared roadway bikeway has its own unique considerations, as identified below.

Signed Bicycle Route (Enhanced Shared Roadway)

These routes are recommended on roadways where bicycles are not given priority, but bikeway signage and markings are used to increase driver awareness of bicycles on the roadway and traffic calming devices and/or intersection crossing treatments enhance bicycle travel. Shared lane markings also direct cyclists to ride in the proper direction and remind cyclists to ride further from parked cars to avoid 'dooring' collisions. Typically, these routes are recommended in locations that serve as alternate routes for dangerous roadways. They were chosen as part of the network because of the importance of overall system connectivity and connectivity to destinations such as parks and schools.

Above: example shared lane marking

Bicycle Boulevard

Bicycle boulevards are recommended on streets with low motorized traffic volumes and speeds where bicycle travel is given priority. Signs, markings, traffic calming and other improvements are used to discourage through trips by motor vehicles and create safe, convenient bicycle crossings of busy arterial streets. Bicycle boulevards are not just signed bicycle routes, but are streets on which bicycles have preference over cars and are designed in a way to effectively divert motorized traffic. Design elements that may be included are diverters, reconfiguration of stop signs to favor the bike boulevard, traffic calming and shared lane markings, as well as crossing improvements at high-traffic crossings. Automotive traffic still has access to residences or businesses, but traffic control devices are used to control automobile traffic speeds and access while supporting through bicycle traffic (also see page 4-3 for information about driveway access management).

Above: example bicycle route

Bicycle boulevards are best developed in areas with especially high potential for bicycle use so that the presence of bicyclists themselves on the street becomes a significant design element. Bicycle boulevards also work well in areas where through motor vehicle traffic can reasonably be directed to other streets.

Implementing Shared Roadway Facility Projects:

The principal considerations for implementing shared roadway bikeways are:

- Minimize the impact of motor vehicle volumes and speeds on

the bicycling environment.
- Create safe and comfortable crossings of high-volume roadways (such as Cooper Street and Collins Street).
- Create minimal disruption to the continuous flow of bicycle traffic.

Traffic Calming

Traffic calming is a component often implemented with a separated bikeway, shared roadway bikeway, and bicycle boulevard. When it is not possible to install a bicycle lane or shared lane markings, traffic calming may improve the bicycling environment. Traffic calming devices are used to reduce motorized vehicle speeds, improve the environment and livability of a street, and provide real and perceived safety for motorized and non-motorized users of a roadway. Traffic calming devices include traffic circles, chicanes, curb extensions, bulb-outs, median islands, and bicycle boulevards. If designed and implemented properly, with consideration for the impacts on bicyclists, traffic calming devices can have beneficial impacts for bicyclists and pedestrians.

Traffic calming should be considered on roadways throughout Arlington on a case-by-case basis.

3.1.3 Off-road Paths

Off-road bikeways are intended to completely separate bicyclists and pedestrians from motorized vehicles. These are the preferred facility for novice and average bicyclists. Special consideration must be given to environmental conditions and all roadway crossings.

Sidepaths

Multi-use paths located adjacent to the roadway are called 'sidepaths'. Sidepaths are most appropriate in corridors with few driveways and intersections. Bicycle routes where side paths are recommended should also have adequate on-road bicycle facilities (such as paved shoulders or bicycle lanes) wherever possible.

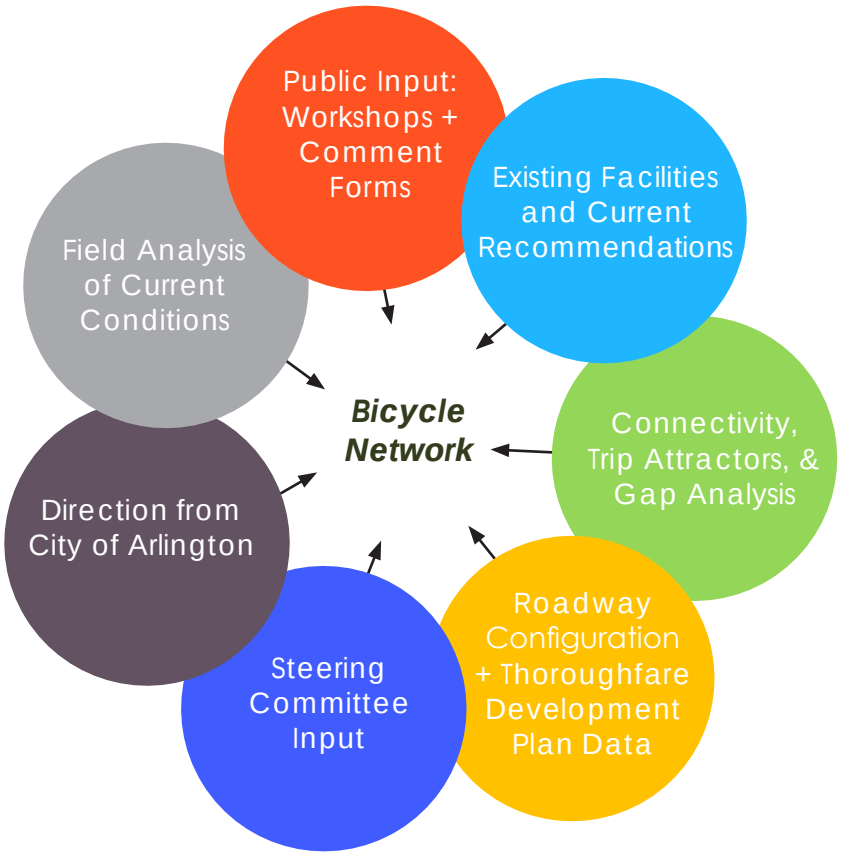
Above: example sidepath

Multi-use Paths or Greenways

Multi-use paths are completely separated from motorized vehicular traffic and are constructed in their own corridor, often within an open-space area. Multi-use paths include greenway trails, rail-trails and other facilities built exclusively for bicycle and pedestrian traffic. The most significant greenway recommendation is the continued development of the regional trail system. The City of Arlington should make every effort to provide connectivity from residential and commercial sites to the trail system through greenway spur trails.

3.2 Methodology for Bike System Design

The bike facility system was designed by first assembling all existing bicycle-related recommendations and information from current plans and studies. Next, a thorough analysis using geographic information systems (GIS) and fieldwork was conducted to examine roadways for recommendations. Finally, on-road recommendations were modified based on 2030 traffic volumes and capacity data that was modeled for the Arlington Thoroughfare Development Plan. The assembled information was then presented to the public, local government staff, the Steering Committee, and various project stakeholders. Together, the input from these groups helped to inform the overall system design through writing and drawing on input maps, filling-out comment forms, direct dialogue, and e-mailed comments. These and other key inputs are shown in the diagram below.



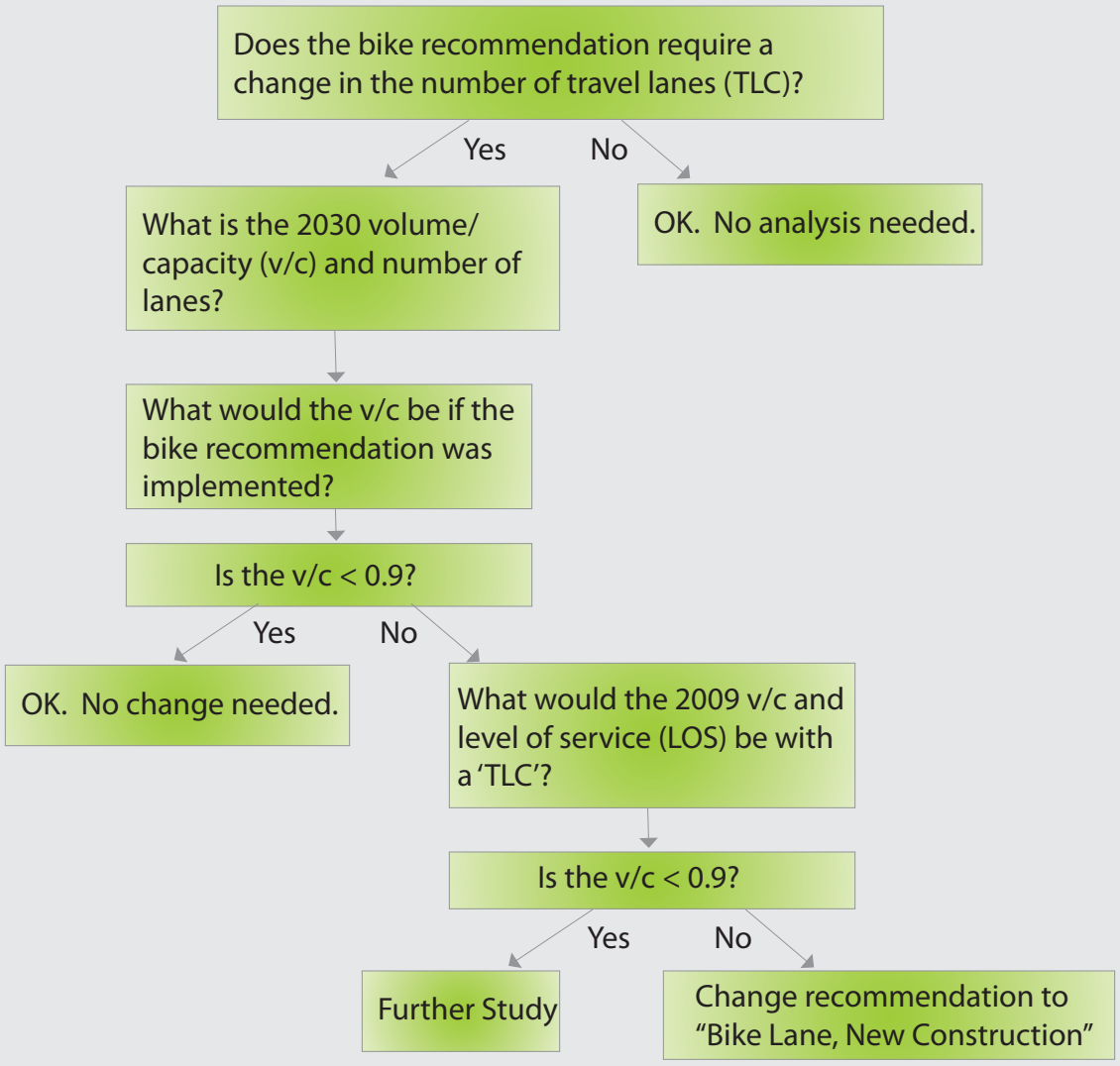
Decision Tree for Recommending Bicycle Facilities

In order to determine what type of facility to recommend for individual roadways, a methodology was developed for the City of Arlington. Utilizing such information as future roadway reconstruction schedules, existing roadway widths, existing roadway speed limits, and existing traffic volumes, the decisions were made through a decision-tree, as presented below.

3.3 Arlington Thoroughfare Development Plan

At the time of this study, the Arlington Thoroughfare Development Plan was also being developed. Data was shared between the consultants for both projects. For purposes of on-road bike recommendations in this Plan, the Thoroughfare Development Plan data sets of volume and capacity for the year 2009 and modeled for 2030 were utilized. All bike lane-travel lane conversion (TLC) recommendations were checked against the Thoroughfare Development Plan data to either verify a reduction in travel lanes or change to a "new construction" recommendation. Also, additional roadways in which bike lanes were recommended were analyzed for 2030 volume/capacity (V/C) ratios to determine if (TLC) were feasible options.

Procedure Used for Analyzing 'Travel Lane Conversion' Bike Recommendations with Thoroughfare Development Plan Data



3.4 Bike System Breakdown

Table 3.1: Mileage Table (Breakout of Recommendations)

Facility Type	*Method*	*Mileage*
On-Road		
Bike Lane	All	21.9
	Stripe	7.8
	Road Diet	4.3
	New Construction	9.8
Signed Bike Route	Signage & Markings	49.8
Wide Outside Lane	Restripe	1.5
Paved Shoulder	New Construction	0.7
Off-Road		
Greenways	New Construction	43.3
Sidepaths	New Construction	21.1
Total		**138.3**

3.5 Bike System Prioritization

While 138 miles of bicycle facilities are recommended, this comprehensive network will be built over a period of many years. This section describes a process that can be used to identify top-priority projects that will have the greatest positive impact on livability, transportation, and recreation.

The suggested prioritization system gives higher priority to segments that: connect residential areas to schools, universities, parks, and existing trails; provide transportation connections for lower-income and/or higher-density residential areas; and connect to Downtown. The weighted criteria included in Tables 3.2 and 3.3 are based on public input, Steering Committee input, and data collected pertaining to Arlington's existing conditions.

It is important to construct facilities as opportunities arise. In addition to criteria-based prioritization, there are two types of opportunity-based projects that the City may want to construct prior to other priority projects because of their ease of construction. These include projects that may be accomplished through low-cost techniques such as striping, restriping, travel lane conversions, or signage/markings, and those that can be accomplished during routine roadway construction, reconstruction, and repaving projects.

The bicycle network is intended to provide a guide for the community that can respond to changing conditions and

community priorities. It is important to note that the City will continue to change and grow, and modification of transportation corridors and land uses will occur. The City should update its list of priority projects as the Plan is updated, at a minimum of every five years.

Table 3.2: Criteria and Weight Suggested for Bike/Ped Project Prioritization

Criteria	*Weight*
Top 1-5 "Most in Need of Improvement" (from Online Survey)	4
Direct Access to/from Downtown	4
Direct Access to/from an Existing or Funded Trail	4
Direct Access to/from a Park or Recreation Center	4
Direct Access to/from a School	4
Serves low income areas with low car ownership rates	4
Segment Contains a Top 10 Intersection "Most in Need of Improvement" (from Online Survey)	4
Elementary, Middle, and High School Proximity (1/2 mile)	4
College/University Proximity (1 mile radius)	4
Direct Access to/from High Density Residential Areas (Census Data)	4
Direct Access to Major Employment Centers	4
Direct Access to/from a Proposed Trail/Veloweb	4
Top 6-10 "Most in Need of Improvement"(from Survey)	3
Park or Recreation Center Proximity (1/2 mile)	3
Regional Connection and/or Interstate Highway Crossing	3
Direct Access to major shopping centers	3

Table 3.3: Criteria and Weight Suggested for Trail Project Prioritization

Criteria	*Weight*
Identified as a Priority Project in Parks Master Plan	4
Direct Access to/from Downtown	4
Direct Access to/from an Existing or Funded Trail	4
Direct Access to/from a Park or Recreation Center	4
Direct Access to/from a School	4
Serves Low Income Areas with Lower Car-Ownership Rates*	4
Elementary, Middle, and High School Proximity (1/2 mile)	4
College/University Proximity (1 mile radius)	4
Direct Access to/from Higher Density Residential Areas	4
Direct Access to Major Employment Centers*	4
Park or Recreation Center Proximity (1/2 mile radius)	3
Regional Connection and/or Interstate Highway Crossing	3
Direct Access to Major Shopping Centers*	3

3.6 End-of-trip Facilities

A comprehensive approach beyond the bicycle network must be taken to incorporate end-of-trip facilities. Citizen input across the country continues to identify bike parking, storage, and/or shower facilities as critical to making transportation by bicycle possible.

Bike Parking

Bike parking is an essential, yet often forgotten component of a complete bike system that provides increased convenience, accessibility, and functionality. Properly designed and placed bike parking at key destinations in addition to corridor bikeways makes cycling a more feasible option for trips to work, the grocery, parks, etc. Parking should be ubiquitous, convenient and secure, and complement the surrounding streetscape. It should be as convenient as motor vehicle parking. The City of Arlington has an opportunity to proactively respond to the parking needs of residents today as well as anticipate parking desires in the future.

Above: example bicycle parking

Bicycle parking can be introduced in a number of ways:

- Zoning code improvements (requirements for bicycle parking spaces with new development).
- Public right-of-way bike rack additions (for short-term parking).
- Bicycle stations (enhanced bike parking areas with lockers and other features).
- End-of-trip facilities to also include showers/changing stations especially at places of work.

The City of Arlington should consider the following to ensure bike parking becomes a priority:

- Seek changes to regulations to ensure all land uses provide ample bike parking and end-of-trip facilities such as showers/change facilities and lockers.
- Ensure high-quality, placement, and function of bike parking to ensure practical, safe, and functional use.
- Encourage building owners to add or upgrade bicycle parking.
- Establish a funding stream to fulfill future parking demand, improvements, and maintenance.

Bicycle Parking - Important Locations

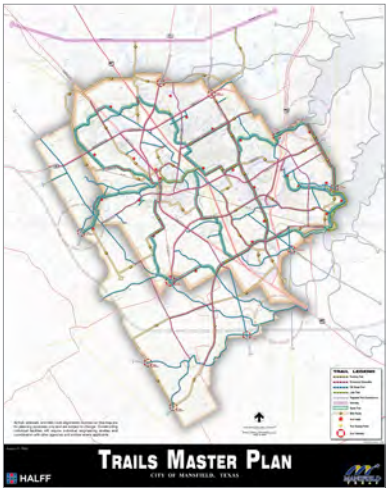
- UT-Arlington and Tarrant County College
- Elementary, middle, and high schools
- Key shopping centers
- Key places of employment
- Downtown

- Entertainment District
- Parks

It is recommended that further analysis be conducted to place bicycle racks at key destinations throughout the City including future transit stops. Bicycle parking should also be made available with new development. Further information about bicycle parking and stations can be found in Chapter 7: Design Guidelines.

3.7 Regional Connectivity

Below: Bike Fort Worth Plan and the Mansfield Trails Master Plan



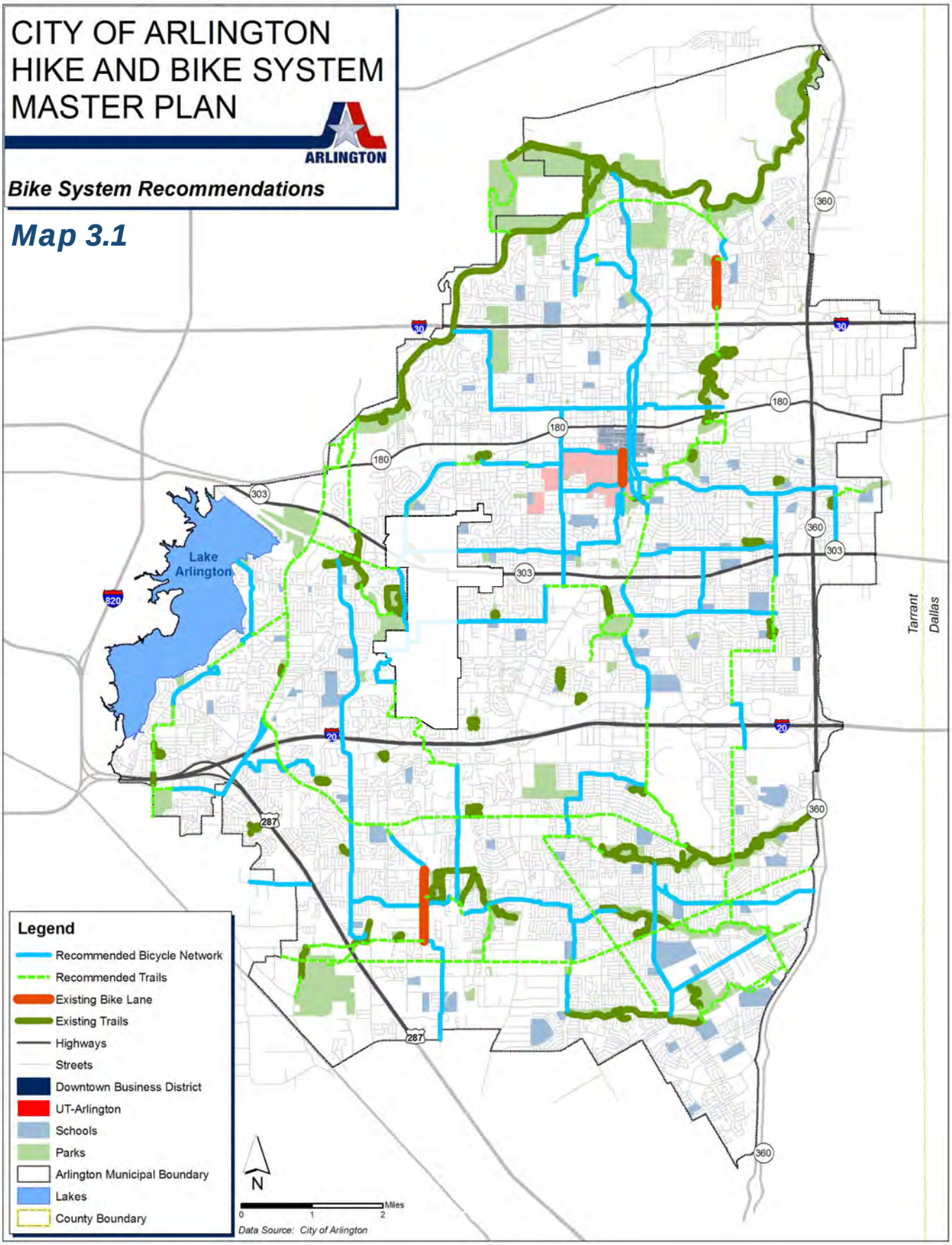
The City of Arlington should look beyond its city limits and link bicycle facilities to neighboring and regional destinations. It is recommended that the City coordinate efforts with surrounding communities to create long distance connections for alternative transportation and recreation. It will be critical to ensure compatibility and connectivity with ongoing planning efforts and actual bicycle facilities that meet at municipality borders.

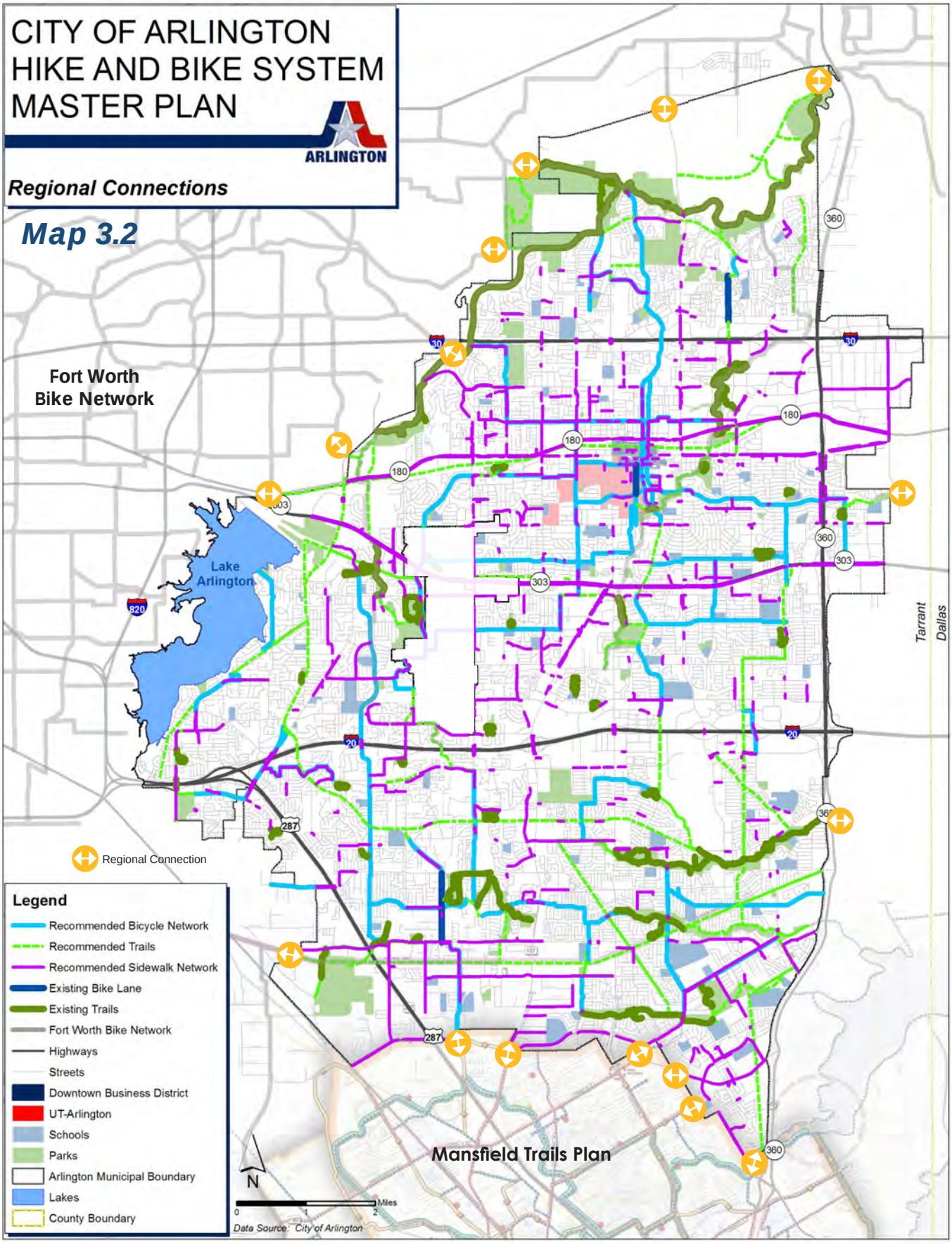
At the time of this Plan development, multiple hike and bike planning efforts have recently taken place or are underway. It will be important to maintain communication with adjacent jurisdictions and the North Central Texas Council of Governments as these efforts continue. Recently, the Fort Worth Bike Plan and the Mansfield Trails Master Plan have been completed. These recommended networks were taken into account when developing the Arlington network.

Regional greenway corridors such as the Veloweb will draw users from all over the Dallas-Fort Worth region into the area, boosting tourism and interest in trail expansion. Long-range planning efforts should be made to connect Arlington into this regional network.

3.8 Bike Network Map

The following citywide map displays the overall bike network recommendations. For easier interpretation of the overall network and a breakout into facility type/method construction, see Appendix G for tiled network maps.


CITY OF ARLINGTON
HIKE AND BIKE SYSTEM
MASTER PLAN
ARLINGTON
Bike System Recommendations
Map 3.1
Lake Arlington
Tarrant
Dallas
Legend
Recommended Bicycle Network
Recommended Trails
Existing Bike Lane
Existing Trails
Highways
Streets
Downtown Business District
UT-Arlington
Schools
Parks
Arlington Municipal Boundary
Lakes
County Boundary
N
Miles
0
1
2
Data Source: City of Arlington


CITY OF ARLINGTON
HIKE AND BIKE SYSTEM
MASTER PLAN
ARLINGTON
Regional Connections
Map 3.2
Fort Worth
Bike Network
Lake
Arlington
Tarrant
Dallas
Mansfield Trails Plan
Regional Connection
Legend
Recommended Bicycle Network
Recommended Trails
Recommended Sidewalk Network
Existing Bike Lane
Existing Trails
Fort Worth Bike Network
Highways
Streets
Downtown Business District
UT-Arlington
Schools
Parks
Arlington Municipal Boundary
Lakes
County Boundary
N
Miles
Data Source: City of Arlington

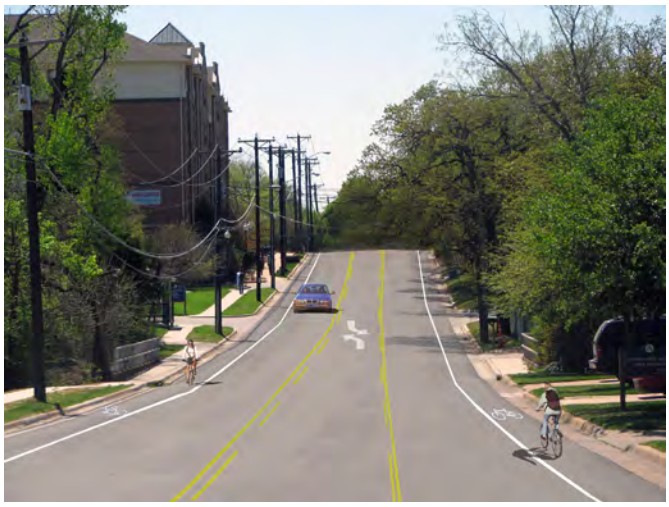
3.9 Bicycle Treatment Photo Visualizations

Various corridors and intersections were photographed and rendered to illustrate proposed recommendations along the bicycle network. The following graphic examples are intended as a visual guide for planning purposes only. A more thorough examination by a landscape architect and/or engineer is warranted prior to implementation.

Pecan Street

Bike Lane - Travel Lane Conversion

Existing Conditions



Proposed improvements include travel lane conversion, restriping, and addition of bike lane.

Lincoln Drive (at Brown Blvd. intersection)

Bike Lane - Stripe

Existing Conditions

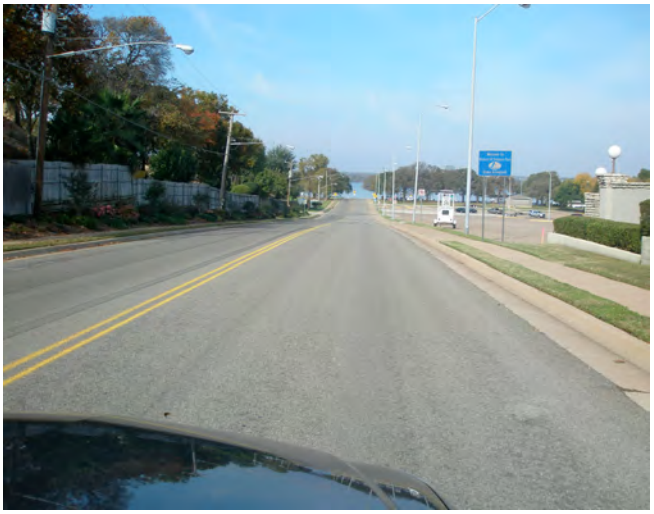
Proposed improvements include restriping, introduction of bike lane, curb ramp along Lincoln.

Tucker Road
Bike Route - Markings and Signage

Existing Conditions

Proposed improvements include introduction of pavement markings and signage.

Arkansas Lane
Bike Lane - Stripe



Existing Conditions

Proposed improvements include introduction of bike lanes

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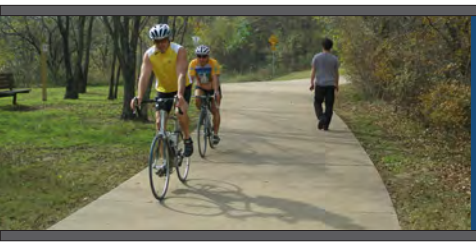
(for double-sided printing)



4. HIKE NETWORK

Chapter Contents

4.0 Overview

4.1 Methodology

4.2 Pedestrian Network Project Types

4.3 Enhancing Walkability: Additional Pedestrian Improvements

4.4 Recommendations and Network Map

4.5 Pedestrian Treatment Photo Visualizations

4.0 Overview

The proposed hike network for Arlington includes a series of pedestrian improvements that create a more connected, comprehensive system. It has been developed from past planning efforts, public input, committee input, field analysis, and geographic information systems (GIS) mapping. This chapter presents the methodology, recommended hike network project types, intersection improvement recommendations, and pedestrian network maps for the City of Arlington.

Successful development of the hike network will require a long-term, cooperative effort between the City of Arlington and TxDOT. This partnership is important because many key recommendations are located on roadways that are owned and maintained by different entities.

4.1 Methodology

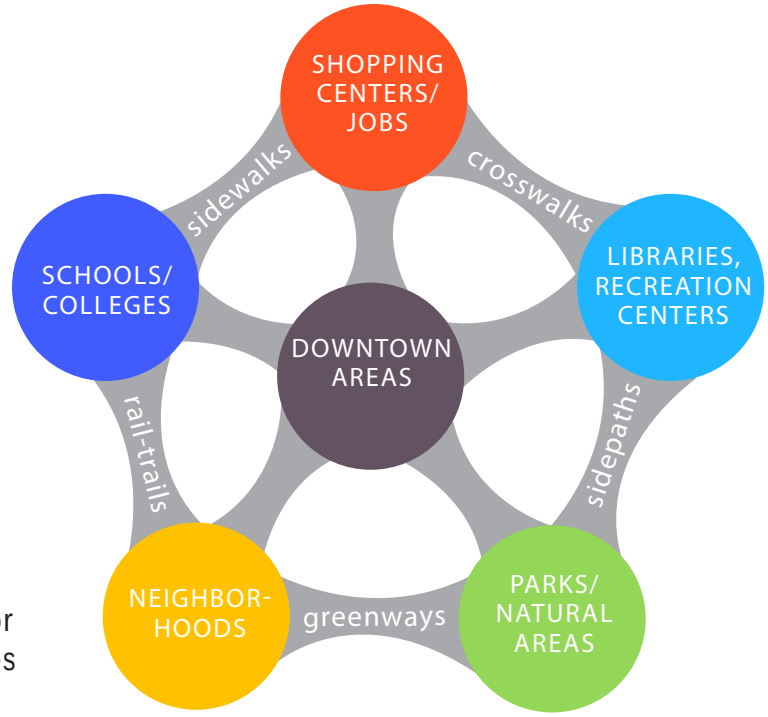
The guiding philosophy in devising the network is the hub and spokes model. Hike corridors (spokes) should connect to trip attractors (hubs), such as parks, schools, Downtown, shopping centers, and other pedestrian corridors. The network then becomes a practical solution for pedestrian travel (see diagram on the next page).

Hub And Spokes Diagram

Fieldwork included an examination of conditions at major intersections, along primary corridors, at pedestrian hubs, and near schools, and a consideration of gap connectivity. Map discussion and analysis was conducted at Steering Committee meetings and public meetings to pinpoint specific areas in need of pedestrian improvements.

HUB AND SPOKES DIAGRAM

The 'hubs and spokes' model conceptually illustrates how destinations are linked through various types of pedestrian facilities.



4.2 Pedestrian Network Project Types

The Proposed Pedestrian Network for Arlington consists of three chief types of projects:

Sidewalk projects - The recommended sidewalks aim to expand upon the existing network of sidewalks to provide a better connected system that links destinations along roadways. Approximately 149 miles of sidewalks are recommended for the City of Arlington.

Greenway/Trail projects – The recommended greenways, described in Chapter 3, aim to expand upon a comprehensive off-road system that utilizes stream corridors and utility easements. Approximately 64 miles of greenways are recommended.

Crossing improvements – 190 crossing improvements are recommended to improve existing street crossings or create new crossings at intersections and mid-block locations. These improvements are critical in order to maintain a safe, connected system throughout the City.

4.3 Enhancing Walkability: Additional Pedestrian Improvements

In addition to these three chief capital improvement efforts, the City of Arlington should take a comprehensive approach geared towards walkability. This includes, but is not limited to:

- Traffic Calming
- Driveway access management
- Connectivity between and within land uses

Above and below: examples of mid block crossings.

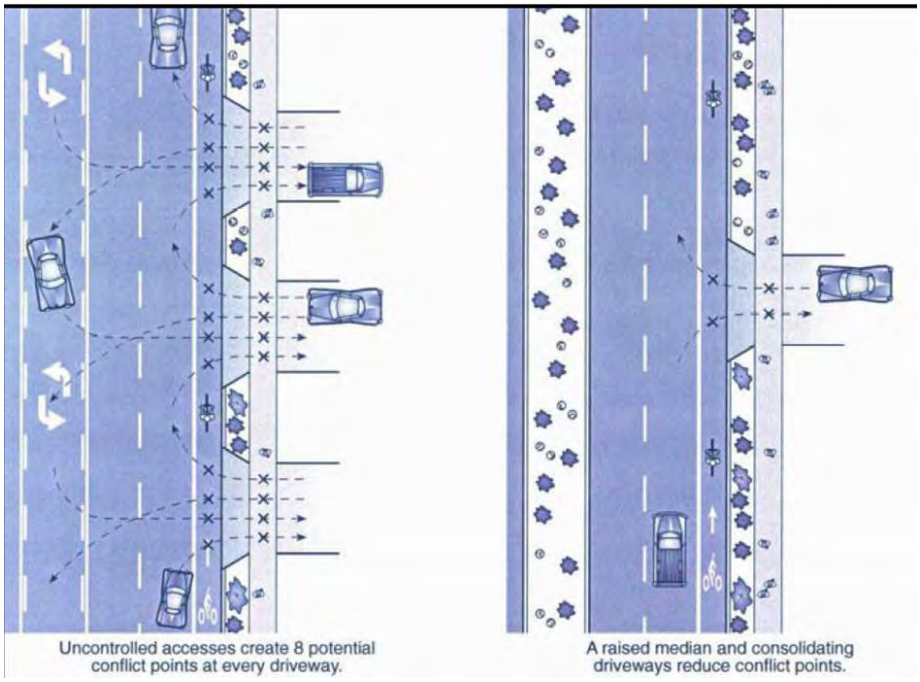
Traffic Calming

Traffic calming is a critical element of a safe pedestrian system and should be considered with all pedestrian improvements made throughout the City, especially for residential and collector roads. Traffic calming elements can be combined with sidewalk and crossing improvement projects or can be developed on their own. In many cases, sidewalk development may not be feasible due to challenges such as right-of-way availability. In these cases, especially near schools, parks, and lower-income residential areas, traffic calming is an effective solution to slow traffic and create safer environments for pedestrians. Examples of traffic calming elements are: in-roadway pedestrian crossing signs (for mid-block crossings), median refuges, curb extensions, and speed humps. See Chapter 8: Design Guidelines for more detail.

Driveway access management

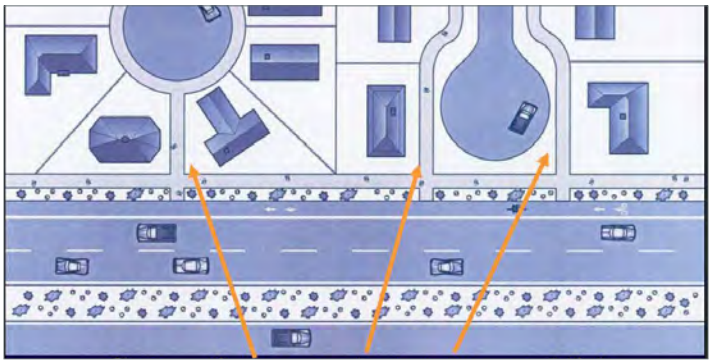
High frequencies of driveways and curb-cuts create hazards for bicyclists and pedestrians. Every time an automobile enters or exits a roadway, it presents a hazard to pedestrians and bicyclists as it crosses their travel path. Hazards are limited by diverting access points to side streets, combining them for adjacent businesses, and closing all redundant or unnecessary access points. Roadway segments with particularly high numbers of curb-cuts include Cooper Street and Collins Street. The City of Arlington should ensure future development limits driveway access.

Driveway access management detail.

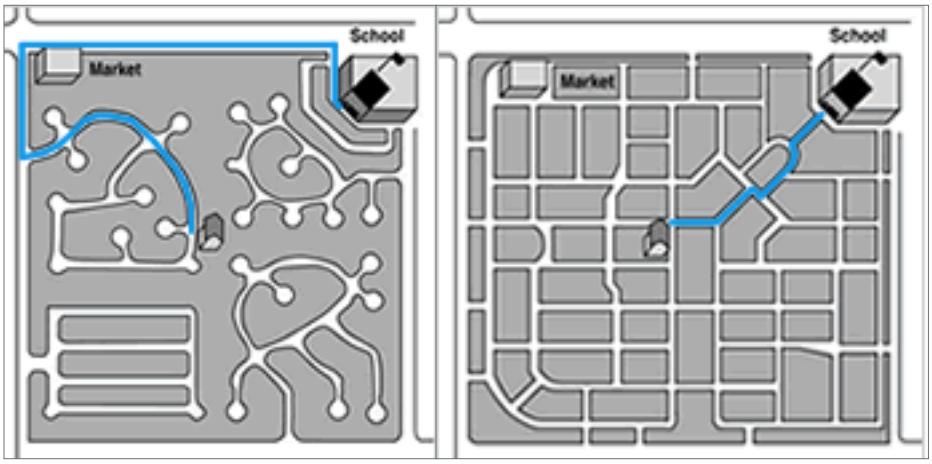


Connectivity Between and within Land Uses

Critical to the walkability of an area is the connection of multiple land uses and the creation of safe, walkable spaces within each type of land use. This principle should be applied to all new development. Mixed-use development promotes bicycle and pedestrian travel for utilitarian trips. However, pedestrian connectivity can also be provided between differing adjacent land uses as well.



Connecting severed streets reestablishes walking routes.



These example diagrams show the route from home to school in two scenarios: a sprawling development pattern that creates indirect routes (left) and a traditional grid street network that allows for more direct routes and more alternative routes between destinations (right).

4.4 Recommendations and Network Map

The pedestrian recommendations in this Plan should be developed or improved to create a safe and connected pedestrian network throughout Arlington. All pedestrian projects undertaken should aim to meet the highest standards possible when site conditions allow. Design guidelines in Chapter 7 provide detailed information regarding type, treatment, and proper placement.

Some of the treatments recommended in this chapter have been proven to reduce crashes, as shown in the 2007 FHWA Crash Reduction Factors Study (http://safety.fhwa.dot.gov). Table 4.1 shows some typical countermeasures and associated crash reduction factors from that study.

Table 4.1 Pedestrian Crash Reduction Factors	
Countermeasure	*Crash Reduction Factor*
Install sidewalk	74%
Install pedestrian countdown signal heads	25%
Install pedestrian refuge islands	56%
Improve/install pedestrian crossings	25%

All recommendations were developed at a planning level. Each of these locations will need a more detailed project-level review. The conclusions reached through more detailed review may vary from those presented herein.

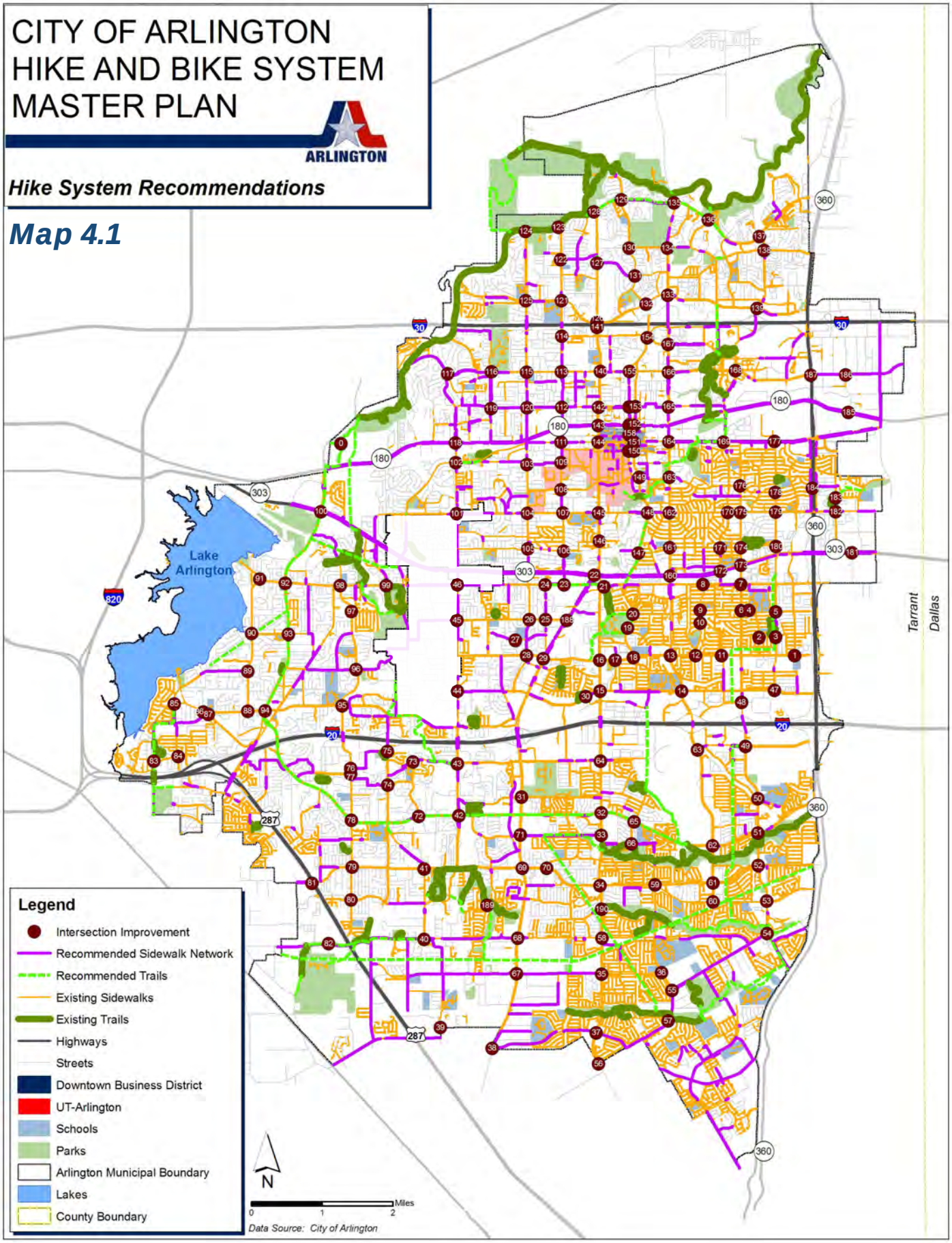
Intersection Recommendation Tables

Most intersections and mid-block crossings in Arlington need some form of improvement (190 intersections were analyzed in detail and recommendations are provided). Pedestrians have a much greater risk of being struck by a vehicle when crossing a roadway as opposed to walking on the shoulder or sidewalk beside it. Nationally, nearly 75% of all police-reported pedestrian crashes involve pedestrians crossing roadway travel lanes.

Committee input, public input, and consultant fieldwork identified the 190 key intersections in Arlington in need of improvement. These are by no means the only crossing improvements needed throughout the City. All intersections should meet standards provided in Chapter 7: Design Guidelines. See Appendix F: Intersection Inventory and Recommendations for these tables.

Hike Network Map

The following citywide map displays the hike recommendations (sidewalks, greenways, and crossing improvements). For easier interpretation, see Appendix G for tiled network maps.



Intersection numbers correspond with tables in Appendix F.

4.5 Pedestrian Treatment Photo Visualizations

Various corridors and intersections were photographed and rendered to illustrate proposed recommendations along the hike network. The following graphic examples are intended as a visual guide for planning purposes only. A more thorough examination by a landscape architect and/or engineer is warranted prior to implementation.

Pioneer Parkway

Sidewalk

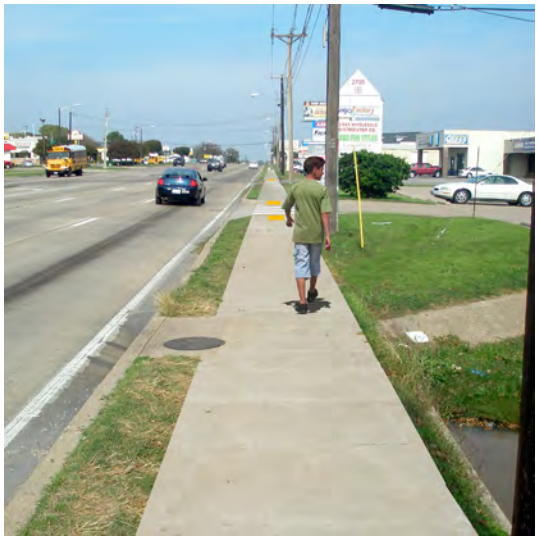
Existing Conditions

Proposed improvements include introduction of sidewalk

Cooper Street

Sidewalk - Curb Ramps

Existing Conditions



Proposed improvements include the introduction of sidewalk and curb ramps, crosswalks at driveway intersections

Green Oaks Boulevard & Matlock Road
Crosswalk + Median Refuge Island

Existing Conditions

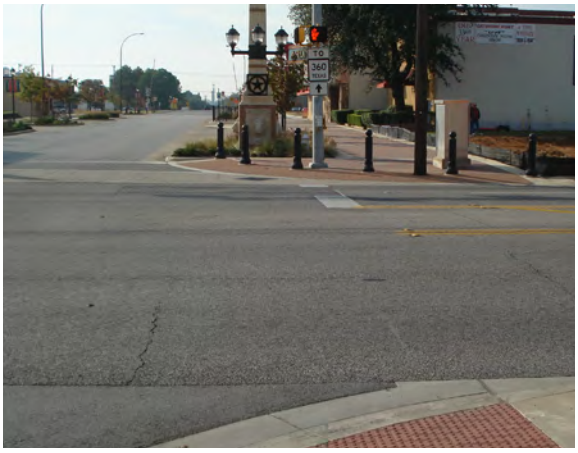
Proposed improvements include high visibility crosswalk striping and a median refuge island.

Stadium Drive & Abram Street
High Visibility Crosswalk

Existing Conditions

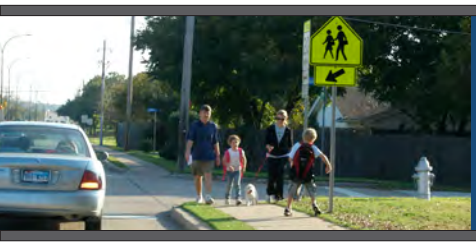
Proposed improvements include introduction of high visibility crosswalk and curb ramps with truncated domes.

Center Street & Division Street
High Visibility Crosswalk



Existing Conditions

Proposed improvements include introduction of highly visible crosswalks and advance stop lines.



5. HIKE & BIKE PROGRAMS

Chapter Contents

5.0 Overview

5.1 Program History and Current Programs

5.2 Programing Recommendations

5.0 Overview

Programming is a key element of a comprehensive strategy to create a more hikable and bikable Arlington. The recommendations in chapters 3-4 are only one piece of the puzzle. Once these amenities are on the ground, it is critical to focus on use and safety for the different types of users through education, encouragement, and enforcement programs. This chapter outlines current programs and makes key recommendations to advance the hike and bike friendliness of Arlington.

5.1 Program History and Current Programs

Arlington and the Dallas-Fort Worth area have had an active bicycle and pedestrian programming history in recent years. The following gives a brief description of ongoing efforts:

City of Arlington

The City of Arlington has conducted programs throughout the years aimed at increasing healthy living, biking, and hiking. These have included such things as bike rodeos, bike safety training, and other initiatives. Recently, the Mayor of Arlington issued pedometers to children to encourage them to walk more. However, the City, with cooperation from local agencies and stakeholders, should begin to invest more in programs that support the goals established through this Plan.

BikeDFW (www.bikedfw.org)

BikeDFW is an organization that includes cyclists and community members working to make cycling safer and easier in the Dallas-Fort Worth region. The mission is to work with local cyclists, clubs, neighborhood groups, businesses, and local governments to increase utilitarian and recreational use of bicycles. An important goal is providing education and encouragement programs. The group provides education courses for cycling on the road and in groups. The Bike DFW website is a tremendous resource, updating the community on local events, cycling training courses, group rides, and news releases and providing information on commuting and advocacy.

Bicycle Clubs

There are many clubs in the Arlington area, geared at recreation and exercise-based riding. They include groups such as the Texas Wheels Cycling Club and Lone Star Cyclists. Bicycles Inc, a local bicycle shop, provides information on safety tips and places to ride, along with a calendar of group rides for everyone from beginners to experts. Two new organizations, Bike Friendly Arlington (BFA) and Friendly Arlington Neighborhoods and Streets (FANS) were formed during the development of this Plan.

5.2 Programming Recommendations

While hundreds of successful programs can be found throughout the United States, a short list has been determined as critical and should be top priorities for Arlington. These specific program recommendations are discussed in detail below. A thorough listing of additional education, encouragement, and enforcement programs and resources can be found in Appendix B.

Bicycle Friendly Community Status

The League of American Bicyclists (LAB) promotes the national Bicycle Friendly Communities (BFC) Program. Only one city in Texas (Austin) has accomplished this designation, a silver ranking. A primary goal for the City of Arlington during this planning process is to gain BFC status. Having an adopted Hike and Bike System Master Plan in place, with key infrastructure and programming elements included, will make Arlington a very strong candidate. The City of Arlington should strive to implement programs that other BFC communities have completed. The detailed audit may be found at www.bikeleague.org/programs/bicyclefriendlyamerica/communities/getting_started.php. It includes questions for five categories: engineering, education, encouragement, enforcement, and evaluation. Action steps in the implementation chapter are specifically geared to address key elements of this audit.

This 2010 booklet is available for download and provides an overview of the Bicycle Friendly Community program: www.bikeleague.org/programs/bicyclefriendlyamerica/

Arlington Hike and Bike Advisory Committee (HBAC)

Due to the significant interest in this planning process at the staff and resident level and the tremendous amount of implementation necessary within Arlington as part of this Plan, a permanent Hike and Bike Advisory Committee (HBAC) should be formed. The HBAC would be a beneficial resource for promoting both bicycle and pedestrian safety, providing feedback on opportunities and obstacles within the City, educating bicyclists and motorists about sharing the road, mobilizing support for bicycle and pedestrian issues, and assisting in the coordination of events and outreach campaigns. HBAC subcommittees could take on specific tasks focusing on facility development, programs, and policy development. Most importantly, this group would focus on citywide issues, including urban, suburban, and rural issues. The group would

ensure that facilities and programs are provided for all Arlington citizens.

The HBAC may be structured in one of two ways. A more formal approach would involve an officially appointed City Council commission that meets regularly and reports to the City Council. A less formal option is a citizen-based, grassroots organization that is not formally appointed by the City Council. There are benefits to both approaches and in many communities, one of each type of committee has been formed. A formal HBAC has a formalized voice in City issues and with the City Council. A citizen-based committee may have more flexibility to reach non-profit status, conduct programs at the local level, and be composed of many members of the community. If both committees are formed, there is tremendous opportunity to collaborate together. For example, an appointed commission could hold meetings in which citizens are invited to voice their concerns and ideas.

The HBAC should seek a broad range of geographic and demographic member representation in order to achieve equity and to address the needs of all Arlington residents. The group could meet monthly or quarterly to encourage and evaluate the progress of overall Plan implementation. This group should work closely with appropriate City staff and local stakeholders. The HBAC should consider playing a major role in the program recommendations described in this chapter and in Appendix B.

Safe Routes to School

Safe Routes to School (SRTS) is a national program that has grown in part because of consistent federal funding, significant interest at the local community level, and a nationwide campaign to reduce childhood obesity. Local Safe Routes to School programs are sustained by parents, community leaders, and citizens to improve the health and well-being of children by enabling and encouraging them to walk and bicycle to school. Communities around the country have received funding to conduct school-related programs, safety/walkability initiatives, SRTS workshops, action plans, or to build hike and bike infrastructure. SRTS is particularly important as a means to reach future generations, to make walking and biking a common, safe practice and create a less automobile-dependent society over time. Immediate and long-term impacts are possible through the SRTS program. The City of Arlington should seek programming and facility funding from the SRTS program, administered by TxDOT.

Hike/Bike Map and Website

One of the most common requests of citizens interested in biking and walking is an informational hike/bike map and website. Currently, there is no official bicycle map for the City of Arlington. Many residents are not aware of existing facilities and trails. User-friendly brochure maps can have a significant impact by providing

legible, informational mapping, wayfinding, and education.

A foldable hardcopy and online map should be developed and distributed throughout the City, through City staff, schools, advocacy groups, and other community organizations. Maps should be made available at parks and recreation centers, libraries, municipal buildings, transit facilities, bike shops, and tourism information centers. The map should be updated annually to reflect the bicycle and trail improvements that will be implemented through this Plan. This map and website are also an opportunity for the City of Arlington to provide information on basic safety, commuting, trail etiquette, and local resources.

Awareness Days and Events

A specific day of the year can be devoted to bicycle and pedestrian awareness and celebrate issues relating to that theme. A greenway and its amenities can serve as a venue for events that will put the greenway on display for the community. Major holidays, such as July 4th, and popular local events serve as excellent opportunities to distribute bicycling information.

- *Bike-to-Work Day* - This is an annual event held on the third Friday of May across the United States that promotes the bicycle as an option for commuting to work. Leading up to Bike-to-Work Day, national, regional, and local bicycle advocacy groups encourage people to try bicycle commuting as a healthy and safe alternative to driving by providing route information and tips for new bicycle commuters. On Bike-to-Work Day, these groups often organize bicycle-related events, and in some areas, pit stops along bicycle routes with snacks. Other ideas for Bike-to-Work month, week, and day include a bicyclists breakfast, commuter contests, and worksite events. This type of event can have a significant impact on bicycling in a community.

- *Walk-to-Work Day* - Although not as popular as Bike-to-Work-Day, this event is typically held during the first Friday of April and is an excellent promotion for walking in a community.

Encouragement Programs

Encouragement programs are critical for promoting and increasing the use of hikeways and bikeways. These programs should address all ages and user groups from school children, to working adults, to the elderly and also address recreation and transportation users. A thorough listing of programs and resources can be found in Appendix B. Top priority encouragement programs are described below and were chosen based on the success and impact of these programs in other communities.

- *Employer Programs* - To encourage bicycling and walking to

Left: Images from bicycle education events.

work, employers can provide programs and incentives. When these alternative forms of transportation are encouraged, employers benefit from improved employee health and morale. They are also often positively perceived as protecting the environment and caring for their local community. Promotions could include organizing a Bike to Work Day or a morning Pit-Stop where employees can receive free refreshments. Employers can provide educational workshops, bicycle parking options, and employee incentives. Incentives may include prize drawings, t-shirts, and free tune-ups at a local bicycle shop.

- *Community Programs* - The Smart Commute Challenge is a great example in the Raleigh-Durham area of North Carolina. Actively supported and encouraged in the Triangle area by Triangle Transit and CAMPO, it is an excellent means of having residents pledge to commute to work by bicycle. Prizes are available and educational information on commuting to work is provided at www.smartcommutechallenge.org/.

- *School Programs* - Many programs exist to aid communities in developing safer pedestrian and bicycle facilities around schools. Information is available to encourage group travel, prevent bicycle-related injuries, and sponsor commuter-related events. After-school programs, walking school buses, summer Bike Camps, bicycle rodeos, and Family Fun Rides can be created to provide a supportive environment for children to learn how to ride a bike comfortably and safely, learn how to repair and maintain a bicycle, and tour their city and its destinations.

- *Bike-sharing and Bike-repair Programs* - Bicycle sharing and bike-repair programs encourage use by providing convenient access and empowerment to make more trips by bicycle. Many programs have also served to teach bike safety, maintenance, and on-road skills and have encouraged more people to bicycle for exercise, transportation, and leisure. In addition,

these programs have increased the visibility of bicycling in communities. With a bike-sharing program, bicycles are made available for shared use by individuals who do not own bicycles. These programs are typically found in urban environments. Community bike-sharing programs are organized mostly by local community groups and non-profit organizations. Smart bike-sharing programs are implemented by municipalities or through public-private partnerships. Bike-repair programs take different forms, but typically are run by local community groups. These groups are supplied with used bicycles that are repaired for use by lower-income residents. Those who receive a bike learn how to maintain the bike and often assist in repairs.

Targeted Enforcement

Enforcement is critical to ensure that motorists, bicyclists, and pedestrians are obeying common laws. It serves as a means to educate and protect all users. The goal of enforcement is for bicyclists, pedestrians, and motorists to recognize and respect each other's rights on the roadway.

In many cases, officers and citizens do not fully understand state and local laws for motorists, bicyclists, and pedestrians. The first step in effective enforcement is the education of law officers, both vehicular and bicycle officers. This type of training can lead to additional education and enforcement programs that promote safety. Law enforcement should also be provided with a legible, handheld rules and regulations card for public distribution.

Key issues to enforce for motorists are speeding, yielding to pedestrians in a crosswalk, and sharing the road with bicyclists. Key issues to enforce for pedestrians are crossing roads at the marked crosswalk, and obeying countdown signals. Key issues to enforce for bicyclists are following the same rules of the road as a motorist (obeying traffic lights and stop signs), riding on the correct side of the road, using lights when cycling at night, and sharing sidewalks and trails safely with pedestrians.

The City of Arlington should also consider deploying bicycle officers, especially in the Downtown and UT-Arlington area. Increased use of police on bikes is a significant benefit for community policing and quality of life. UT-Arlington should also be encouraged to use bicycle officers and the two efforts should be coordinated. Bicycle

Right: The Speed Campaign Toolkit from the National Highway Traffic Safety Administration (NHTSA) includes messaging and templates you may choose from to support your speed management initiatives: www.nhtsa.gov/speed/toolkit/index.cfm

officers should set an example for other cyclists by wearing helmets and obeying laws.

Internal Training

'Internal' education refers to the training of all staff who are involved in the implementation of the Hike and Bike System Master Plan. Internal training is essential to institutionalizing hike and bike issues into the everyday operations of Public Works and Transportation, Community Development and Planning, and Parks and Recreation departments. In addition to relevant City staff, TxDOT staff, should also be included in training sessions whenever possible. This training should cover all aspects of the transportation and development process, including planning, design, development review, construction, and maintenance. This type of 'inreach' can be in the form of brown bag lunches, professional certification programs, and special sessions or conferences. Even simple meetings to go over the Plan and communicate its strategies and objectives can prove useful for staff and elected officials that may not have otherwise learned about the Plan. Bicycle and pedestrian planning and design issues are complex, and state-of-the-art research and guidelines continue to evolve. Therefore,

training information should be updated frequently and offered on a regular basis.
Local law enforcement should be trained in accurate reporting of bicycle and pedestrian crashes involving automobiles. Proper interpretation of individual circumstances and events is critical for proper enforcement and respect between motorists and bicyclists. Special training sessions that focus on laws related to bicycle and pedestrian travel should be instituted and occur annually for new police department employees. Every effort should be made for representation from the City police on the HBAC.

The State of Texas bicycle laws can be found here:
http://bicycleaustin.info/laws/tx-bike.html

The State of Texas pedestrian laws can be found here:
http://law.onecle.com/texas/transportation/chapter552.html

The City of Arlington bike rules and regulations can be found here:
www.arlingtonpd.org/index.asp?nextpg=CrimePrevention/ChildrensPrograms/childrensprogarts.htm

Pilot Programming Effort
Through cooperation with TxDOT, Arlington should provide strong education, encouragement, and enforcement campaigns whenever a major hike and/or bike improvement will occur. When a major improvement is made, the roadway environment changes and proper interaction between all users is critical for overall safety. This type of outreach could take place through the local media outlets, on-site, or at special events.

6. IMPLEMENTATION

Chapter Contents

6.0 Overview

6.1 Key Action Steps

6.2 Staffing Recommendations

6.3 Network Development

6.4 Action Steps Table

6.0 Overview

The detailed action steps found in this chapter describe how recommendations from previous chapters should be implemented. It describes how the City of Arlington can turn the vision of a connected network of safe hike and bike routes into a reality. The strategy for doing so involves some physical changes to the roadway environment and other landscapes, as well as new local government policies and programs. Successful implementation will require the dedication of the City of Arlington, the creation of a citywide Hike and Bike Advisory Committee (HBAC), and the support of local advocates such as Bike Friendly Arlington. It will be a collaborative effort between a variety of City departments and agencies including TxDOT.

This chapter is organized as a simple guide with key action steps, staffing recommendations, an evaluation and monitoring process, and methods of hike and bike network development. Perhaps most importantly is the detailed action steps table at the conclusion of this chapter that lists tasks, lead agencies, support groups, task detail, and timeframe.

6.1 Key Action Steps

Adopt This Plan

Before any other action takes place, the City of Arlington should adopt, publicize, and champion this Plan. This should be considered the first step in implementation. Through adoption of this document as the City's official Hike and Bike Plan, the City of Arlington will be better able to shape transportation decisions so that they fit with the goals of this Plan. Adoption gives the Plan credibility and authority and it is key to securing implementation funding from TxDOT and other state and federal agencies.

Create an Implementation Strategy

The City of Arlington should develop an internal strategy to implement the Hike and Bike System Master Plan. As a part of this strategy, the City should identify specific individuals and program areas that will be responsible for implementing the various aspects of the Plan from day-to-day efforts to long range goals. The City of Arlington should also consider establishing a Hike and Bike Advisory Committee (HBAC) to assist in implementation. Such a committee should focus on education, advocacy, partnerships, events and community service. It should provide a communications link between the citizens and the City, as well as an avenue for reviewing/revising project priorities.

Bike Friendly Arlington was formed during this planning process and some of its members could help form the HBAC.

Adopt a Complete Streets Policy

Adopting a "Complete Streets" policy sends a clear signal across City departments and the State of Texas that Arlington is dedicated to providing legitimate transportation options for all users. While the City of Arlington Comprehensive Plan, Code of Ordinances, and Zoning Ordinance/Subdivision Rules and Regulations address nonmotorized transportation in a number of important ways, Complete Streets is a new framework for integrating the Hike and Bike System Master Plan into a more systematic approach to implementation. A full description of the recommended Complete Streets Policy is described at the end of Appendix C.

Provide Hike and Bike Facilities as Part of all Transportation Projects

To the maximum extent possible, as discussed in the Complete Streets policy statement, the City of Arlington should accommodate bicyclists and pedestrians as part of all new roadway projects, bridge projects, and roadway reconstruction/resurfacing projects. This includes roadways in the Hike and Bike Network as well as other roadways. In addition, trails should be developed in conjunction with sewer, electrical, water, and other efforts that use or create linear corridors.

Seek Multiple Funding Sources and Facility Development Options

Multiple approaches should be taken to support hike and bike system development and programming. It is important to secure the funding necessary to undertake the short-term, priority projects, but also to develop a long-term funding strategy to allow continued development of the overall system.

Capital and local funds for sidewalk, bicycle lane, crosswalk, and greenway construction should be set aside every year. Even small amounts of local funding can be used to match outside funding sources. A variety of local, state, and federal options and sources exist and should be pursued.

The City should continually monitor state and federal legislation to identify pending actions which could impact Plan implementation. This includes tracking new and existing funding streams as federal agencies begin to shift their focus to creating livable, healthier, and sustainable communities. City staff and the HBAC should work with elected leaders to position the City of Arlington to receive funding under the federal reauthorization and other new programs from such agencies as the Centers for Disease Control and Prevention.

Funding options are described in Appendix D. Other methods of hike and bike facility development that are efficient and cost-effective are described later in this chapter.

Begin Priority Projects

The Arlington Hike and Bike Network will be developed incrementally over time. As mentioned in Section 3.5, the City should identify top-priority projects based on criteria such as sidewalk gap closure, proximity to schools, greenways, and trip attractors, and ability to improve safety and connectivity. Priority projects may also be those that are "shovel-ready" such as on-road bike lanes where only stripes, restripes, or travel lane conversions are required for development. The City should also consider bond-funded projects as priority projects since they may be constructed as part of upcoming projects.

Development of these priority projects should result in a swift return on investment, noticeable improvements in the hike and bike network, and ultimately generate positive buzz and excitement for the implementation of additional Plan components. Priority projects should be supported by local funding and become part of the local Capital Improvement Program (CIP). The priority projects list should be regularly evaluated by the HBAC and City of Arlington to assess success and progress. Additionally, it should be a dynamic list and as projects are completed and come off the list, new priority projects should be identified.

Improve and Enforce Hike/Bike Policies

As discussed in Appendix C, the City of Arlington does not adequately address the needs of bicyclists and pedestrians in its current ordinances and planning documents. To ensure that future development provides sidewalks and bike facilities and improves hike/bike friendliness, regulations should be updated and enforced. It should be the goal of the City of Arlington Community Development and Planning Department to update ordinances and adopt the bicycle ordinance in this Plan as soon as possible.

Be Open To Creative Solutions

In many cases, the most ideal hike and bike improvement scenario will not be achievable because of ROW issues, homeowner issues,

and traffic engineering constraints. The City of Arlington should remain open to alternative solutions in these cases and utilize the entire toolbox of hike/bike treatment solutions found in Chapter 8-Design Guidelines. For example, if sidewalks are not immediately feasible due to funding constraints or ROW issues, traffic calming techniques within the roadway ROW may be acceptable ways to improve the safety of pedestrians and bicyclists.

Seek Bicycle-Friendly Community (BFC) Status

A primary goal for the City of Arlington during this planning process is to gain Bicycle Friendly Community status. Having an adopted Hike and Bike System Master Plan in place, and an initiation of action steps (found in this chapter) will make Arlington a strong candidate. The City should examine the BFC audit for engineering, education, encouragement, enforcement, and evaluation and seek to address the majority of audit items.

Begin Key Programs

In addition to network recommendations and policies, programs, as described in Chapter 5, are critical for education, encouragement, and safety. Top programs to pursue immediately are:

- Safe Routes to School
- Hike/Bike Map and Website
- Awareness Days and Events
- Encouragement programs such as employer incentives, commute challenges, school programs, and bike lending/rental programs
- Enforcement for education programs
- Internal training for multiple departments within City of Arlington

Programs such as Safe Routes to School (top) and bicycle education (bottom) are an important part of improving safety for walking and bicycling.

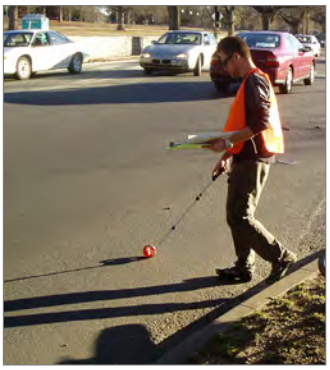
Ongoing Public Outreach

The planning process to develop this Hike and Bike System Master Plan featured a tremendous outpouring of good attendance, interest, and support. It will continue to be important to maintain that outreach and support as important projects move forward. Interested citizens should be made aware when projects or programs have been successfully implemented.

Begin Quarterly Meeting with Project Partners

It is critical to establish a procedure for the development of the hike and bike system as part of future roadway reconstruction and resurfacing projects. Roads throughout Arlington vary in ownership between the state and the City. Quarterly meetings with representatives from TxDOT, City of Arlington Public Works and Transportation, City of Arlington Community Development and Planning, City of Arlington Parks and Recreation, and the HBAC should occur in order for proper communication to occur. These

meetings will help establish a process of incorporating hike and bike improvements into upcoming roadway projects. Coordination between all appropriate government agencies will establish a system of checks and balances, provide a level of accountability, and ensure that recommendations in this Plan are implemented. The meetings could also feature special training sessions on hike/bike issues.



This Plan involved compiling information from the field into GIS data. Maintaining that data will be important as facilities are developed.

Maintain GIS Hike/Bike Data

In crafting this Plan, a comprehensive database has been developed that documents the location and type of existing and recommended sidewalks and bike facilities. It is important for the City to update the information on a continual basis. The outputs (maps, etc.) of this database should be made accessible to local governments, residents, and visitors through a website and/or hardcopy formats.

Benchmark Progress

An annual performance report should be published to benchmark progress made in improving the hike and bike environment in Arlington. It is critical to document all successes, both big and small. This document would be a showcase of success stories and would serve as a barometer for work that still needs to be accomplished. Such a performance report would also be an excellent tool as the City of Arlington works toward improving its Bicycle Friendly Community status.

As part of this report, performance measures should address the following aspects of hike and bike system development. When establishing performance measures, the City should consider utilizing data that can be collected cost effectively and reported at regular intervals, such as in a performance measures report that is published annually or biannually. The following are example performance measures:

1. *Safety* – Measure and map the number of hike and bike accidents on an annual basis. Analyze trends.
2. *Usage* – Target specific projects and areas and take measurements to determine use by cyclists and pedestrians. Take counts to determine the total number of riders, gender of riders, helmet usage, and the number of cyclists riding the wrong way on a street. These counts should occur annually to help determine the success of new projects, programs, and policies.
3. *Overall Mode Share* – With updated 2010 census, calculate the new bicyclist and pedestrian mode shares.
4. *System Development* – Measure how many projects are constructed, in accordance with the recommendations of this Plan. Maintain cumulative statistics such as miles of bike

lanes, miles of sidewalks, percentage of intersections that meet ADA guidelines, etc. Also report on the quality of these implemented recommendations.

5. *Education and Enforcement* – Work with local law enforcement to measure the number of people that participate in education programs and the number that are ticketed for violations of motor vehicle, bicycle, and pedestrian laws.
6. *Policy* – Regularly review and update hike/bike-related policies.
7. *Institutionalization* – Measure the total budget spent by local governments on hike and bike projects and programs.

Annual Work Plan

In addition to monitoring progress, the HBAC (or appropriate City staff) should also develop an annual work plan with specific, measurable tasks such as the addition of (x) miles of bike lanes, (x) number of bike racks, or (x) number of new programs. An annual work plan should be updated throughout the year and re-established each year. This work plan can include specific recommendations from this Master Plan.

Prepare Additional Documents and Studies

This Plan should be viewed as a springboard for additional hike and bike planning, research, and documentation. Additional efforts that should be completed include:

1. Publish the *bicycle/walking map* described in Chapter 5.
2. Work with TxDOT and the City Public Works and Transportation Department to investigate *bicycle detection at intersections and traffic signal timing*. Upon completion of evaluation, specific improvement recommendations should be made.
3. Conduct an internal *bicycle parking study*. This should identify and inventory existing parking facilities and make specific recommendations for the location of additional bicycle parking facilities. A phased priority listing should be developed for implementation. See the Action Steps Table at the end of this chapter for more details.

Maintain Hike and Bike System

The City of Arlington should make an investment in the maintenance of both on-road and off-road facilities to ensure the quality and safety of its hike and bike infrastructure investments. Potholes, surface hazards, sight obstructions, drainage grate issues, bike lane debris, sidewalk/trail deterioration, etc. should be addressed on a regular basis. Maintenance is described in detail in Chapter 7: Design Guidelines.

Create a Sidewalk/Bicycle Lane/Greenway Request Form
Many communities across the country have created an on-line hike/bike request form that citizens can use to ask for sidewalks and bicycle lanes to be built on streets that they use regularly. Citizens may also request maintenance through this form. The development of a universal request form should be considered, to ensure that prospective projects are judged "apples to apples" and that key funding eligibility questions are asked and answered.

Utilizing local citizens to help find gaps in the current hike and bike network is highly important because they are familiar with their specific neighborhoods and needs. After these forms are completed the requested facility can be evaluated by HBAC and City personnel, and if deemed important for connectivity purposes it should be added to the City's list of priority projects.

Update the Hike and Bike System Master Plan on Regular Basis
As Plan recommendations are implemented, roadways are added, and land uses change, priorities for hike and bike improvements may change and new needs and opportunities may arise. This Hike and Bike System Master Plan should be updated every five years.

6.2 Staffing Recommendations

Currently, the Transportation Planning Manager inside the Community Development and Planning Department handles most on-road hike and bike planning responsibilities. The City Parks and Recreation Department largely handles off-road hike and bike planning. As this Plan is adopted and implemented, it is recommended that certain responsibilities for implementation be identified for the Community Development and Planning Department, including working with TxDOT, other City departments, and stakeholders on priority projects, and working with adjacent municipalities and counties to ensure regional collaboration and connectivity. Other responsibilities could also be housed the Parks and Recreation Department, such as implementation for trail-related recommendations, serving as "staff" to the HBAC, and implementation of education/encouragement programs.

6.3 Network Development

This section describes types of transportation construction and maintenance projects that can be used to implement the hike and bike recommendations. Note that roadway reconstruction projects offer excellent opportunities to incorporate transportation improvements for bicyclists and pedestrians. It is much more cost-effective to provide a bicycle facility when these road projects are implemented than to initiate the improvement as a "retrofit."

In order to take advantage of upcoming opportunities to incorporate hike and bike projects into routine transportation

projects, the City should continue to track repaving schedules, and other lists of projects. Additionally, the TxDOT's local office should be encouraged to use this Plan as a ready reference when maintenance projects are being programmed. As recommended in this chapter, a quarterly meeting with project partners will ensure this critical communication. As the long-range transportation plan is updated in future years, hike and bike improvements should be included in appropriately programmed projects.

Bicycle Projects

Restriping

The simplest type of restriping project is the addition of bicycle lanes, edgelines, or shoulder stripes to streets without making any other changes to the roadway. Bicycle lanes, edgelines, and shoulder stripes can also be added by narrowing the existing travel lanes or removing one or more travel lanes. For a discussion of lane-narrowing and travel lane conversions, see Chapter 3.

On-Street Residential Parking

Some city streets are wide enough to stripe with bike lanes, but they are also used by residents for on-street parking. Existing parking on residential streets will not be prohibited due to the addition of bicycle lanes. When adding a bike lane to a residential street, the city will convene a neighborhood meeting to alert residents about the upcoming improvement and to obtain input. During this input process, the City will look to existing methods of evaluating public support.

If it is not practical to add a bike lane due to existing on-street parking, edgelines and bike route lane markings may be considered. On roads where the outside lane and parking area combined are more than 17 feet wide, 10-foot-wide travel lanes can be striped with an edgeline, leaving the rest of the space on either side for parking. The stripe would help slow motor vehicles and provide extra comfort for bicyclists, especially during the daytime when fewer cars would be parked along the curb. On roads with outside lane and parking areas that are narrower than 17 feet wide, lane markings can be provided every 100 to 200 meters on the right side of the motor vehicle travel lane to increase the visibility of the bike route. If existing on-street parking is under-utilized, it may also be possible to consolidate on-street parking to one-side of the roadway, providing additional space for bicycle lanes.

Repaving

Repaving projects provide a clean slate for revising pavement markings. When a road is repaved, the roadway should be restriped to create narrower lanes and provide space for bike lanes and shoulders, where feasible. In addition, if the spaces on the sides of non-curb and gutter streets have relatively level grades and few obstructions, the total pavement width can be widened to include paved shoulders.

Installing Bike Route Lane Markings and Signage

The City of Arlington should adopt the use of signed and marked bike routes as one of its bicycle facility types. Shared lane markings are recently MUTCD approved pavement markings that take the place of traditional bicycle lanes where lanes are too narrow for striping, where speeds do not exceed 35 mph, and/or where there is on-street parking. The intent of the shared lane marking is threefold: 1) they draw attention to the fact that the roadway is accommodating bicycle use and traffic; 2) they clearly define direction of travel for both bicyclists and motorists; and 3) with proper placement, they remind bicyclists to bike further from parked cars to prevent "dooring" collisions.

Compared to building trails or adding pavement width, shared lane markings are fairly easy to install, and come at lower costs.

Traffic calming

Non-arterial roadways may require traffic calming to slow motor vehicle speeds and make bicycling more comfortable. This is necessary to create bicycle boulevards. These treatments are described in detail in Chapter 7: Design Guidelines.

Roadway Construction and Reconstruction

Bicyclists should be accommodated any time a new road is constructed or an existing road is reconstructed. In the long-term, all roadways should have on-road bicycle facilities. However, sidepaths can be an acceptable solution in the short-term when a road has few driveways and high-speed, high-volume traffic.

The Center Street bridge is an excellent example of bridge replacement designed and built to accommodate more than just automobile traffic.

Bridge Replacement

All new or replacement bridges should accommodate bicycles with on-road facilities on both sides of the bridge. If the bridge is in a developed area or an area that may experience development in the future, it should also have wide sidewalks on both sides to accommodate all types of bicyclists and pedestrians.

Federal law, as established in the Transportation Equity Act for the 21st Century (TEA-21), makes the following statement with respect to bridges:

"In any case where a highway bridge deck is being replaced or rehabilitated with Federal financial participation, and bicyclists are permitted on facilities at or near each end of such bridge, and the

safe accommodation of bicyclists can be provided at reasonable cost as part of such replacement or rehabilitation, then such bridge shall be so replaced or rehabilitated as to provide such safe accommodations." (23 U.S.C. Section 217)

Bridge replacement projects on controlled access freeways where pedestrians and bicyclists are prohibited by law should not include facilities to accommodate bicyclists and pedestrians. In cases, however, where a bridge replacement project on a controlled access freeway impacts a non-controlled access roadway (i.e., a new overpass over an arterial roadway), the project should include the necessary access for pedestrians and bicyclists on the non-limited access roadway (i.e., paved shoulders, sidewalks, and pedestrian/bicycle crossing improvements). Existing and planned greenway crossings, both at-grade and below new bridges, should be similarly accommodated during bridge replacement projects.

Retrofit Roadways with New Bicycle Facilities

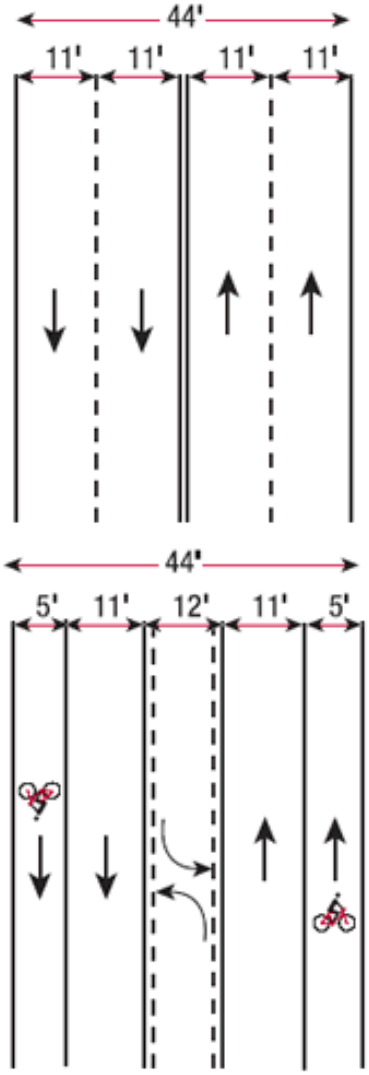
There may be critical locations in the Bicycle Network that have bicycle safety issues or are essential links to destinations. In these locations, it may be justifiable to add new bicycle facilities before a roadway is scheduled to be repaved or reconstructed.

In some places, it may be relatively easy to add extra pavement for shoulders, but others may require removing trees, moving landscaping or fences, or regrading ditches or hills. Retrofitting roadways with sidepaths creates similar challenges. Improvements in these locations are typically recommended in the long-term.

Some roads may require a "travel lane conversion" (TLC) solution in order to accommodate bicycle facilities. TLCs involve removing vehicle travel lanes and replacing these lanes with on-road bicycle facilities and sidewalks or sidepaths. Further study may be necessary for recommended TLCs to ensure that capacity and level-of-service needs are balanced against bicycle level of service needs.

Signage and Wayfinding Projects

Signage along specific routes or in an entire community can be updated to make it easier for people to find destinations. Bicycle route signs are one example of these wayfinding signs, and they should be installed along routes independent of other signage projects or as a part of a more comprehensive wayfinding improvement project.



Typical before and after lane configurations for a travel lane conversion scenario.

Pedestrian Projects

Residential and Commercial Development
As detailed in Appendix C, the construction of sidewalks and safe crosswalks should be required during development. Construction of pedestrian elements that corresponds with site construction is more cost-effective than retrofitting. In commercial development, emphasis should also be focused on safe pedestrian access into, within, and through large parking lots. This ensures the future growth of the pedestrian network and the development of safe communities.

Retrofit Roadways with New Pedestrian Projects
For priority pedestrian projects, it may be necessary to add the improvements before a roadway is scheduled to be reconstructed. In some places, it may be relatively easy to add sidewalk segments to fill gaps, but other segments may require removing trees, relocating landscaping or fences, re-grading ditches or cut and fill sections, and/or relocating/reconfiguring the drainage system.

Repaving
Repaving and resurfacing projects provide a clean slate for revising pedestrian crosswalks, especially high visibility marked crosswalks, advanced stop lines, and enhanced curb ramps. Depending on the project, sidewalk and refuge islands may be developed as well.

6.4 Action Steps Table

Task	Lead	Support	Details	Phase
Approve and adopt this Plan	City of Council	Project Consultant	Through adoption, the Plan becomes a legitimate planning document of the City. Adoption shows that the City has been part of a successful, supported planning process and is a partner in implementation.	Short Term (2011-2012)
Adopt "Complete Streets" policy.	City Council	Community Development and Planning, Parks and Recreation, Public Works and Transportation, HBAC	The City of Arlington should adopt a "Complete Streets" policy, described in Chapter 6, to continue the momentum of the hike and bike master planning process and adoption. This policy will send a clear signal of the City's intention to design, construct, and reconstruct streets that are meant for all modes of transportation.	Short Term (2011-2012)
Create official City of Arlington Hike and Bike Advisory Committee (HBAC)	Community Development and Planning, Parks and Recreation	Community Development and Planning, Parks and Recreation, Public Works and Transportation	The HBAC will be instrumental in promoting biking/hiking and championing implementation of this Plan. The group would play a strong role in assisting City of Arlington, fundraising, and establishing programs and activities. The group should be divided into meaningful subcommittees such as policy, program, implementation, and evaluation groups. HBAC members should be responsible for reading the Hike and Bike System Master Plan and becoming familiar with the content.	Short Term (2011-2012)
Continue public outreach through the media	Community Development and Planning, Parks and Recreation	HBAC	The City of Arlington should utilize the media to announce the adoption of the Plan. Media would include all local newspapers, websites, and local television. When significant hike and bike projects are constructed, the media should be notified in order to spread the word to the public. This will help build upon successes.	Continuous/ Ongoing
Identify priority projects	Community Development and Planning, Parks and Recreation	Public Works and Transportation, HBAC	The City of Arlington should utilize Section 3.5 to identify priority projects. Tables 3.2 and 3.3 provide recommendations for criteria and weighting that may be used to determine priority projects.	Short Term (2011-2012)
Complete priority projects	Community Development and Planning, Parks and Recreation	Public Works and Transportation, TxDOT, HBAC	The prioritization of hike and bike system development will provide a list of the most important projects to improve connectivity and safety. Consider a bond referendum for greenways and roadway improvements for bicycle transportation. First phase work that can be done at a low cost includes crossing improvements and the simple bicycle lane/bicycle route projects.	Short-Medium Term (2011-2013)
Identify and secure specific multiple funding sources and facility development options for priority projects implementation	Community Development and Planning, Parks and Recreation, Public Works and Transportation	HBAC, Bike Friendly Arlington, TxDOT, project partners	Appendix C contains funding opportunities. Chapter 7 describes hike and bike system development methods.	Short Term (2011-2012) and Continuous/ Ongoing
Hold quarterly project development meetings with project partners	Community Development and Planning, Parks and Recreation	Public Works and Transportation, TxDOT, HBAC	These meetings will help establish a process of incorporating hike and bike improvements into upcoming roadway projects. Many hike and bike projects recommended in this Plan could be developed as part of a roadway reconstruction, widening, or resurfacing project. Coordination between all appropriate City departments and TxDOT will ensure that recommendations in this Plan are implemented. The City of Arlington, with assistance from HBAC, may need to "chase pavers" on occasion to ensure facilities are implemented during ongoing projects.	Short Term (2011-2012) and Continuous/ Ongoing

Task	Lead	Support	Details	Phase
Update Design Criteria Manual using design guidelines developed in this Plan	Public Works and Transportation, Community Development and Planning	Parks and Recreation	The design guidelines in this plan represent the most current AASHTO and MUTCD standards for development of the hike and bike network. These should be utilized and become an official component of the Design Criteria Manual. (Chapter 8)	Short Term (2011-2012)
Coordinate policies between this Plan and the Comprehensive Plan	Community Development and Planning	Public Works and Transportation	The City of Arlington Hike and Bike System Master Plan should become a component of the Comprehensive Plan. This step will make clear the importance of both documents working together in future development and growth decisions. Also, recommended additions/ revisions found in Chapter 6 should become amendments to the Comprehensive Plan.	Short Term (2011-2012)
Make revisions and additions to ordinances	Community Development and Planning	Public Works and Transportation	The changes suggested in Chapter 6 serve as recommendations for the Code of Ordinances, Subdivision/Zoning Ordinance, and Design Criteria Manual. They reflect the findings and recommendations of this Hike and Bike Plan, and clarify some basic policy positions regarding future development of the hike and bike system. Some edits are also suggested for consistency in terminology.	Short Term (2011-2012)
Conduct a bicycle parking study to ensure adequate bicycle parking, especially at high demand locations.	Community Development and Planning, Parks and Recreation	HBAC	Identify and inventory existing parking facilities and make specific recommendations for the location of additional bicycle parking facilities. A phase priority listing should be developed for implementation. Also: 1) Work with local business associations to determine needs, 2) Finalize policy requirements, 3) Develop programs and funding mechanisms such as sponsorship, 4) Develop incentives and assistance to encourage private building owners to install bike racks, 5) Revise special events permitting and ensure that bike parking is provided at large events in the Entertainment District, 6) Ensure high quality guideline for design and placement (see Chapter 8), and 7) Encourage upgrade of existing, inadequate bike racks.	Short Term (2011-2012)
Ensure planning efforts are integrated regionally	Community Development and Planning, Parks and Recreation	HBAC, NCTCOG, TxDOT	Combining resources and efforts with surrounding municipalities, regional entities, and stakeholders is mutually beneficial. After adoption by the City, this document should also be recognized in regional transportation plans.	Short Term (2011-2012) and Continuous/ Ongoing
Publish Annual Performance Report (Benchmark Progress)	Community Development and Planning, Parks and Recreation	HBAC	Publish an annual report to provide an update on progress made during that year to advance hike and bike modes.	Annually
Continually evaluate implementation of this plan through ***monthly progress reports*** and an ***annual work plan***	Community Development and Planning, Parks and Recreation	HBAC	The HBAC, along with key City departments, should evaluate the progress of this Plan and set measurable goals within an annual work plan.	Continuous/ Ongoing
Develop a long term funding strategy	Community Development and Planning, Parks and Recreation	Public Works and Transportation, TxDOT, HBAC	To allow continued development of the overall system, capital funds for hike and bike construction should be set aside every year, even if only for a small amount (small amounts of local funding can be matched to outside funding sources). The City may even start a small matching grant fund for future grant opportunities. Funding for an ongoing maintenance program should also be included in the City operating budget. (Appendix C)	Short- to Medium-Term (2011-2013)
Grow Safe Routes to School program locally.	Community Development and Planning, Parks and Recreation, Local School System	Local schools, HBAC, SRTS Program	Apply for Safe Routes to School funding for planning and implementation. Establish 'bike-to-school' groups, walking school buses, and regular bicycling activities for children through the Safe Routes to School Programs through 2012.	Short Term (2011-2012) and Continuous/ Ongoing

Task	Lead	Support	Details	Phase
Update and maintain hike and bike GIS database	Information Technology/GIS	Community Development and Planning, Parks and Recreation	Continuously update the hike and bike database as new projects are completed or planned and new crash data is published. The City of Arlington GIS group should lead this effort, but other agencies and departments must coordinate as changes to the hike and bike network are made.	Continuous/ Ongoing
Take the necessary steps to achieve designation as a 'Bicycle Friendly Community' by the League of American Bicyclists	HBAC, Bike Friendly Arlington	Community Development and Planning, Parks and Recreation	Download and review the application for the Bicycle Friendly Community designation. Determine which action steps of this plan would be the most strategic in terms of applying for the desired designation. Place emphasis on completing those steps, then apply.	Short- to Medium-Term (2011-2013)
Track release of the recently updated AASHTO bicycle and pedestrian design guide	Public Works and Transportation, Community Development and Planning, Parks and Recreation	NCTCOG, TxDOT	Review the new AASHTO bicycle and pedestrian guidelines when published in late 2010-2012. Consider utilization of these new guidelines for the recommendations in this Plan.	Short- to Medium-Term (2011-2013)
Create online form for hike/ bike facility request	Community Development and Planning, Public Works and Transportation	HBAC	Provide a service that allows residents to comment on hike and bike needs/desires and report maintenance or misuse issues.	Short- to Medium-Term (2011-2013)
Develop City hike/bike map	Parks and Recreation Department, Community Development and Planning	HBAC	A hardcopy and online map will display the hike and bike network, destinations, and educational materials. This map should be updated every 3-5 years.	Medium-Term (2012-2013)
Perform bicycle detection and traffic signal timing analyses.	Public Works and Transportation	Community Development and Planning, TxDOT	Work with TxDOT and local municipalities to investigate bicycle detection at intersections and traffic signal timing. Upon completion of evaluation, specific improvement recommendations should be made.	Medium-Term (2012-2013)
Maintain hike and bike facilities	Parks and Recreation	Public Works and Transportation, Community Development and Planning	TxDOT and the City of Arlington should make immediate repairs to any locations within the hike and bike system that are damaged or have hazardous conditions. The City should make commitment to regular sweeping of bicycle lanes.	Continuous/ Ongoing
Begin commuting encouragement	HBAC, Bike Friendly Arlington	Community Development and Planning, Parks and Recreation	Develop programs and incentives for employers to bicycle to work. Work with local employers to accomplish this goal. Continue to promote and expand Bike to Work Month and Bike to Work Day.	Continuous/ Ongoing
Increase enforcement efforts	Police Department	Community Development and Planning, Parks and Recreation	Target and enforce all illegal motorist and bicyclist behavior that may jeopardize public safety and the success of the Hike and Bike Network, particularly speeding for motorists, and disobeying stop signs/riding wrong direction for cyclists, etc.	Continuous/ Ongoing
Begin pilot programming effort	Public Works and Transportation, Community Development and Planning, Parks and Recreation, Police Department	HBAC	Begin pilot education/encouragement/enforcement campaign immediately following the completion of a major hike and bike project.	Continuous/ Ongoing

Task	Lead	Support	Details	Phase
Expand upon local events such as Bike to Work/Month and Week	HBAC, Bike Friendly Arlington	Community Development and Planning, Parks and Recreation	Bike-to-Work Month and Week (May of every year) offers an opportunity to conduct education and encouragement programs. The HBAC, Bike Friendly Arlington, local advocacy groups, bike clubs, City staff, and employers should assist in growing this celebration every year into bigger events with increased participation	Annually
Identify Hike and Bike Coordinator position	Community Development and Planning, Parks and Recreation	City Council, HBAC	The "keeping" of this Plan would be the Coordinator's primary responsibility, including working closely with the City of Arlington departments, TxDOT, NCTCOG, and adjacent municipalities to ensure its implementation, review, and regular update. The Coordinator would also serve as "staff" to the HBAC.	Medium- to Long Term (2012-2020)
Apply for bicycle parking/ locker grant applications.	Community Development and Planning, Parks and Recreation, HBAC	Bike Friendly Arlington	Apply for grant funding to provide enhanced bicycle parking and lockers.	Medium-Term (2012-2014)
Provide bicycle parking in key locations throughout City of Arlington.	Community Development and Planning, Parks and Recreation, HBAC	Public Works and Transportation, Bike Friendly Arlington	Upon completion of the bike parking study, provide bicycle services such as bicycle racks, covered parking, bicycle stations, showers at employment centers, and bicycle rentals. Work with downtown and UT-Arlington groups and HBAC to determine other key locations for future parking facilities.	Medium-Term (2012-2014)
Update Hike and Bike Master Plan	Community Development and Planning, Parks and Recreation	Public Works and Transportation, HBAC	Update entire Hike and Bike Master Plan every five years. This provides an opportunity for significant revision based on progress to-date, land use/transportation changes, and current needs and opportunities.	Long Term (2016)
Identify and complete next set of priority projects	Community Development and Planning, Parks and Recreation	Public Works and Transportation, HBAC, TxDOT	In 2016, reassess projects and reevaluate priorities and phases. Consider updating the entire plan.	Long Term (2016-2020)

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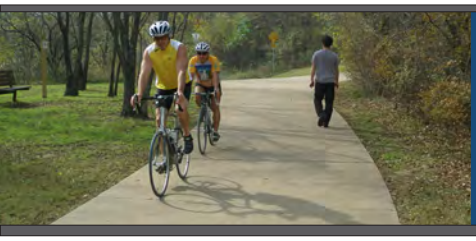

7. DESIGN GUIDELINES

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7.1 INTRODUCTION

Walking and biking are becoming popular alternative modes of transportation for residents to navigate in and around the City. A key goal for the City of Arlington is to provide design guidelines for future development so as to facilitate a safe environment for bicyclists and pedestrians of all ages and abilities. These design guidelines are based on national standards and best practices for this region and around the country.

How to Use this Guide

A full list of design guidelines is outlined in this chapter. The intent of this chapter is to follow the example set forth in the national design standards as defined by the American Association of State Highway Transportation Officials (AASHTO), the Americans with Disabilities Act (ADA), the Federal Highway Administration (FHWA), the Manual on Uniform Traffic Control Devices (MUTCD), and the Texas Department of Transportation (TxDOT). The City of Arlington intends for these recommended guidelines to be used in designing a complete, safe, attractive, and functional off-road and on-street environment in the City for both pedestrians and bicyclists. In some cases, design adjustments may be necessary in order to achieve the best result. Any design adjustments need to be evaluated by a qualified engineer, landscape architect, or state bicycle coordinator. If national standards are revised in the future and result in discrepancies with this chapter, the latest national and state standards should prevail for all design decisions.

How this Guide was Created

This chapter was created as part of the Hike and Bike System Master Plan. Additional information from other reports and studies were used to develop the different criteria of each type of recommendation. This guide incorporates comments and input from the City of Arlington.

7.2 REFERENCES & RESOURCES

The following is a list of national and state references/resources utilized to develop the design guidelines for the City of Arlington's Hike and Bike System Master Plan. Many of these documents are available online and provide a wealth of information and resources to the public.

Federal Guidelines:

AASHTO Guide
Guide for the Development of Bicycle Facilities, 1999
American Association of State Highway and Transportation Officials, Washington, DC.
www.transportation.org

AASHTO Green Book
Policy on Geometric Design of Streets and Highways, 2001; American Association of State Highway and Transportation Officials,
Washington, DC.
www.transportation.org

Bicycle Lanes Versus Wide Curb Lanes: Operational and Safety Findings and Countermeasure Recommendations; U.S. Department of Transportation Federal Highway Administration
www.fhwa.dot.gov/publications/research/safety/pedbike/99035/99035.pdf

Designing Sidewalks and Trails for Access
Part I of II: Review of Existing Guidelines and Practices
U.S. Department of Transportation Federal Highway Administration
www.fhwa.dot.gov/environment/sidewalks/index.htm

Designing Sidewalks and Trails for Access
Part II of II: Best Practices Design Guide
U.S. Department of Transportation Federal Highway Administration
www.fhwa.dot.gov/environment/sidewalks/index.htm

MUTCD
Manual on Uniform Traffic Control Devices, 2009
Federal Highway Administration, Washington, DC.
mutcd.fhwa.dot.gov

ITE Manual
Designing Walkable Urban Thoroughfares: A Context Sensitive Approach
http://www.cnu.org/streets

State and City Guidelines:

PBIC / APBP
Bicycle Facility Selection: A Comparison of Approaches; Michael King, for the Pedestrian and Bicycle Information Center
Highway Safety Research Center, University of North Carolina - Chapel Hill; August 2002
www.bicyclinginfo.org/pdf/bikeguide.pdf

Bike Lane Design Guide (City of Chicago)
www.bicyclinginfo.org/pdf/bike_lane.pdf

Bicycle Parking Design Guidelines
www.bicyclinginfo.org/pdf/bikepark.pdf

Oregon Bicycle and Pedestrian Plan
www.oregon.gov/ODOT/HWY/BIKEPED/planproc.shtml

Texas Manual on Uniform Traffic Control Devices (MUTCD)
www.txdot.gov/txdot_library/publications/tmutds.htm

Local Guidelines:

City of Arlington, Texas Design Criteria Manual
www.arlingtontx.gov/publicworks/pdf/design_criteria_manual.pdf

City of Arlington, Thoroughfare Development Plan
www.arlingtontx.gov/planning/Transportation.html

North Central Texas Council of Governments
www.nctcog.org

7.3 DESIGN PRINICIPLES

These recommended Hike and Bike Design Principles have been tailored to meet the specific development needs of the City of Arlington's pedestrian and bicycle system. They are based on creating a livable community where bicycling and walking will be incorporated into existing and proposed transportation projects to achieve the overriding goal of improvement, safety, convenience, and comfort.

Because streets are a critically important part of a livable and healthy community and the growing demand for multimodal streets, this document adheres to the "Complete Streets Principle" that roadways shall be planned, designed, and developed to enable safe, attractive, and comfortable access and travel for all users which includes walking, biking, and public transit, to co-exist with automobiles. The Complete Street Act is currently being debated in Congress and should it be approved, it will require that "all federally funded transportation projects, (with certain exceptions), must accommodate the safety and convenience of all users in accordance with certain Complete Street Principles. This will ensure that the safety and convenience of all users of a transportation system, including pedestrian, bicyclist, public transit users, and motorists are accommodated in all phases of project planning and development.

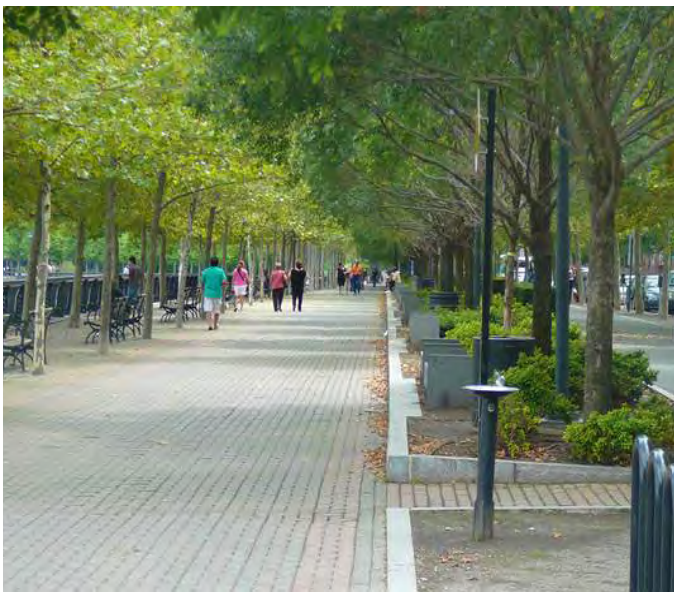
This document is also based on the principle of designing hike and bike projects that are aesthetically pleasing and sensitive to the environment and community within which they are located. This type of design process is often described as context sensitive design. Hike and bike improvements must incorporate the important and often competing values of a variety of stakeholders that live, work, and play in the City. Successful solutions that address safety, mobility, and the communities overall interest shall prevail.

The following are key principles for these design guidelines:

- The City of Arlington has both off-road trails and on-street pedestrian and bicyclist facilities. These two systems will be interconnected to make it possible for many destinations in the City to be accessible for pedestrians and bicyclists.
- The law gives bicyclists the same rights and responsibilities as automobile drivers. In Arlington, all roads except for limited access highways are legal for bicycle usage.
- Bicyclists typically have a wide range of skill levels from expert to novice. These skill levels are commonly designated as Type A, B, and C. A Type A bicyclist is an experienced adult who is capable of riding in motorized traffic in a shared road situation. A Type B bicyclist has less experience and is most comfortable riding in a sepa-

rated bike facility such as a bike lane. A Type C bicyclist is a recreational bicyclist who is most comfortable on a low-volume residential road or off-road trail (often a child or senior adult). These groups are not always exclusive and are often mixed on a shared-use path. It is critical to ensure that safety and convenience of all users of a transportation system are accommodated in all project planning and development projects. At a minimum, the facilities will be designed for Type B bicyclist use, with the overall goal to meet the needs of Type C bicyclists to the greatest extent possible. In areas where specific needs have been identified (i.e., near schools), the needs of appropriate types of bicyclists will be accommodated.

- Design guidelines provide a recommended direction and are not a substitute for a more thorough evaluation by a qualified engineer or landscape architect during the design and construction process.



7.4 PEDESTRIAN NETWORK

Planned sidewalk and crossing improvements must meet AASHTO, MUTCD, TxDOT, and City of Arlington Design Criteria Manual (latest edition) standards.

A. Sidewalk Standards

The sidewalk corridor is typically the portion of the pedestrian system from the edge of the roadway to the edge of the right-of-way or property line. Successful sidewalks include minimal obstacles; moderate grades and slopes; rest areas outside of the pathways; minimal changes in level areas; firm, stable, and slip resistant surfaces; and adequate lighting (Figure 7.4.1).

The City of Arlington has made the commitment to create sidewalks that are safe and to ensure connectivity through the community. In pursuing that effort, the City has developed a design system that divides the sidewalk corridor into three zones. The system is used to determine the width of the sidewalk improvements for each land-use and roadway classification. The three zones within the sidewalk corridor are referred to as the frontage, the sidewalk zone, and the pedestrian buffer (Figure 7.4.2).

The frontage zone separates pedestrians from building fronts by providing distance between the property line and the sidewalk. If the sidewalk is adjacent to open spaces, such as residential areas, or parks, the frontage zone can be eliminated. Typically the frontage zone is used in urban areas. It should be free of obstacles and protruding objects. Sidewalks in urban situations against buildings need additional width and vertical clearance to allow for building awnings and signage (Figure 7.4.3).

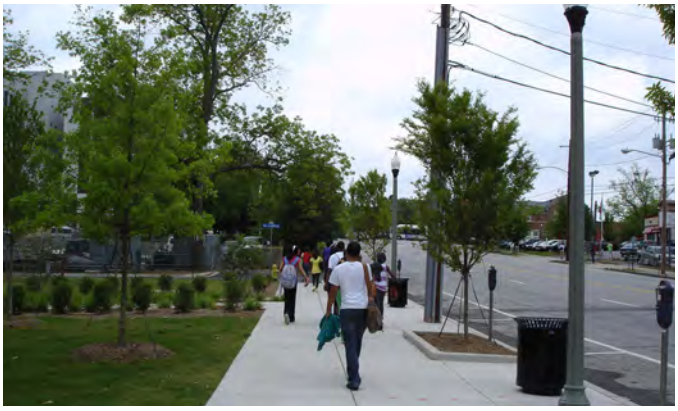


Figure 7.4.1. Wide sidewalk allows for high pedestrian use and street amenities.

The sidewalk zone is the paved walking area. Wider sidewalks provide more comfort and space for users and are preferred in high pedestrian use areas, such as in urban/commercial/mixed-use locations. The width of a sidewalk zone is one of the most significant factors in determining the type of pedestrian experience. In urban areas, the sidewalks can be paved from the back of the curb to property lines. In other areas, the paved portion of the sidewalk may be setback from the street leaving space for a pedestrian buffer/furnishing zone.

The City of Arlington standard sidewalks range from a minimum of 4-feet to 7-feet wide, not including curb and other obstructions. Refer to

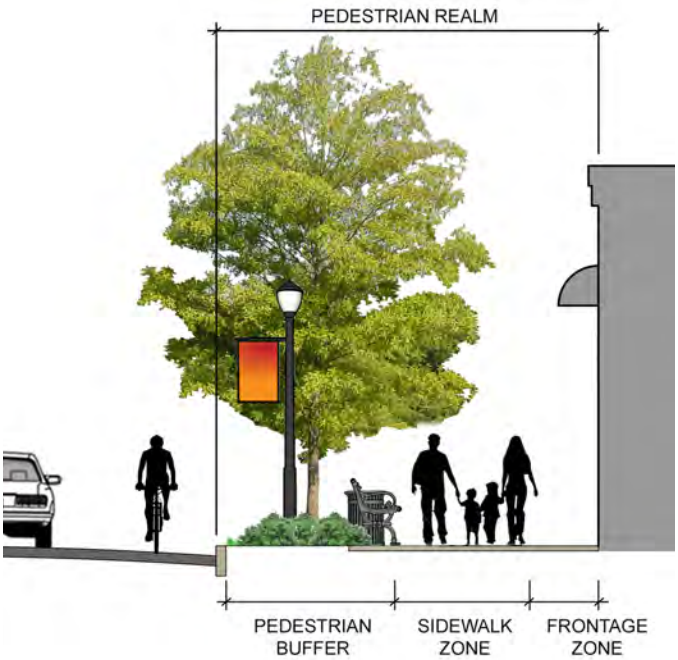


Figure 7.4.2. Sidewalk corridor zones.

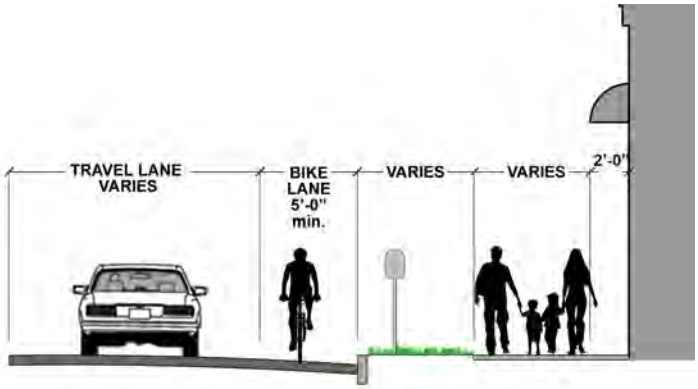


Figure 7.4.3. Frontage zone.

the Thoroughfare Development Plan for minimum sidewalk width requirments for various street types. A six-foot-wide sidewalk width is desirable if right-of-way and other site conditions allow. This width allows two pedestrians, including handicapped users, to comfortably walk side by side, or to pass each other. It can also provide enough space for two pedestrians to pass a third pedestrian without leaving the sidewalk. Sidewalks should be clear of obstructions such as sign posts, utility and signal poles, mailboxes, parking meters, fire hydrants, trees, and other street furniture (Figure 7.4.4).

The pedestrian buffer/furnishing zone, often referred to as a planting strip, provides a physical separation between pedestrians and vehicular travel lanes. This improves safety, helps decrease road noise, prevents splashing onto sidewalk users, and creates a more positive pedestrian experience. The pedestrian buffer/furnishing zone provides a place for street trees and landscaping, sign posts, utility and signal poles, mailboxes, parking meters, fire hydrants, and other site furnishings to be located. Streets designed with a pedestrian buffer or a furnishing zone should be landscaped with low maintenance plantings. Trees, street furniture, and other objects should not obscure or impair motorist and pedestrian visibility (Figures 7.4.5).

When cars are parked perpendicular or diagonally to sidewalks, a minimum of a four-foot parking lot buffer with wheel stops shall be provided to prevent car overhang and narrowing usable sidewalk width (Figures 7.4.6). When feasible it is the City of Arlington's goal to provide a complete street section (Figures 7.4.7).

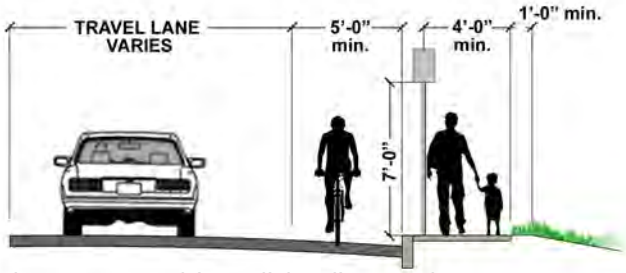


Figure 7.4.4. Sidewalk/walkway clearances.

Figure 7.4.5. Sidewalk with pedestrian buffer zone.

Figure 7.4.6. Sidewalk with landscape buffer at parking lot.

Figure 7.4.7. Typical complete street section.

Design Criteria:

- Refer to Thoroughfare Development Plan for the minimum sidewalk/pedestrian realm standards.
- All new construction of sidewalks shall meet ADA accessibility requirements.
- Frontage zone dimensions vary from 0-3 feet depending on the street and land-use classification.
- A minimum 4-foot parking lot buffer shall be provided when cars are parked perpendicular or diagonally to sidewalks.
- Pedestrian buffer/furnishing zone width ranges from 6 to 8 feet, depending on the street and land-use classification.
- Sidewalks are typically required on all streets, and shall be located on each side of the street within the existing right-of-way. Sidewalks are not required on local rural streets or cul-de-sac streets, or otherwise as determined by the City of Arlington.
- Should permanent obstructions occur in the sidewalk path, a minimum of 3 feet of clearance shall be provided. All obstructions that can be relocated should be located outside of the sidewalk zone.
- A minimum of 7 feet is required for vertical clearance on sidewalks.
- Objects mounted on a pole or to a wall shall not protrude more than 4 inches into the sidewalk throughway zone.
- Sidewalk surfaces shall be smooth concrete or paved surfaces.
- The standard width for sidewalks on bridges is 7 feet. Sidewalks on bridges next to high-speed travel lanes require a vehicle barrier at the curb line. Bridge pedestrian rails must be ADA compliant (Figure 7.4.8).
- The maximum slope of a sidewalk is 5 percent.
- Handrails are to be provided if slopes in excess of 5 percent are encountered.
- The maximum grade of 12:1 (8.33 percent) is acceptable for a rise of no more than 2.5 feet. A level landing area at least 5 feet long and 5 feet wide at 2 percent grade shall be provided at each end (Figure 7.4.9).
- Changes in level surface from .25 to .5 inches shall be beveled. Changes greater than .5 inches shall be removed or a ramp with a maximum grade of 8.3 percent shall be installed.
- Gaps and grate openings should not allow passage of a .5 inch sphere or the long dimension of the opening should be perpendicular or diagonal to the dominant direction of travel.
- The maximum cross-slope for a walkway is 2 percent.

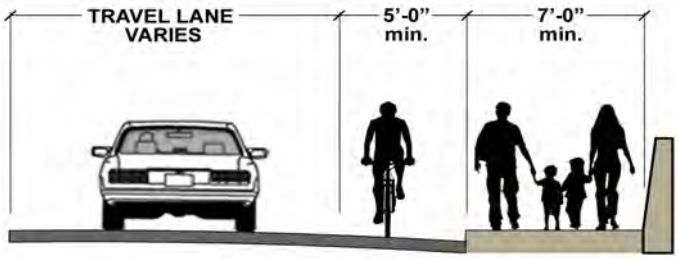


Figure 7.4.8. Sidewalk on bridge.

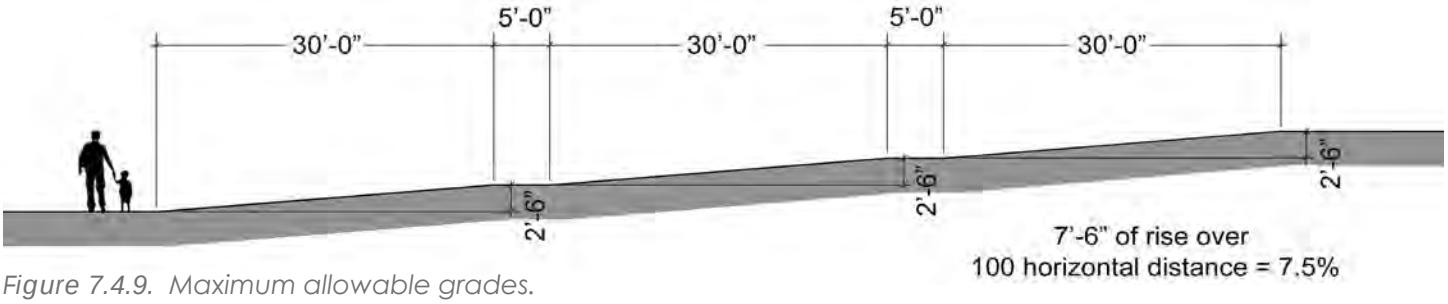


Figure 7.4.9. Maximum allowable grades.

- When on-street parking is provided, a minimum furnishing zone of 5 feet shall be required. This allows car doors to open and people to exit from the vehicle without blocking the sidewalk.
- At driveways, curb cuts, and road approaches, a 4-foot minimum sidewalk area must be maintained at 2 percent cross slope. Additional right-of-way may be secured to maintain minimum sidewalk widths and maximum slopes when crossing driveways or curb cuts.
- Passing space on sidewalks at intervals of no more than 200 feet should be provided. The passing areas shall be a minimum of 5 feet by 5 feet.
- Sidewalks that are narrow or in steep terrain areas should provide rest and passing areas outside of the pedestrian zone.
- In steep terrain areas, wider sidewalks are recommended to allow wheelchair and handicap users to travel in a zigzag motion to reduce the grade they must travel.
- Pedestrian signage indicating the upcoming grade is recommended in steep terrain areas.
- It is recommended that with new construction, the elevation of the buildings be coordinated with the elevation of the road to provide ADA access.
- If on street parking is permitted, periodic curb ramps along planting strips should be provided to facilitate pedestrian access onto the sidewalk.
- It is recommended that the larger the sidewalk width, the larger the width of the planter or furnishing zone that should be provided.
- When transit stops are provided, larger furnishing zones are recommended. Transit requirements vary, but should be coordinated with and connected to an accessible path of travel.
- Should new building construction occur that requires wider sidewalks to accommodate the increase in pedestrian traffic, it is recommended that the property owner donate the property to the City and be responsible for construction that meets the sidewalk standards.
- On narrow right-of-way areas, if additional right-of-way cannot be obtained, a corridor traffic study is recommended to determine if street widths can be reduced in order to create a wider path of travel for the pedestrians.
- Street tree plantings should be considered to provide a visual buffer between pedestrian and automobile traffic, improve the aesthetic appearance of the street, and provide shade or shelter in warm and windy regions. Tree and root protection devices should be used to minimize sidewalk and paving maintenance issues. The proper tree should be chosen based on the tree and site characteristics. Refer to TxDOT and City requirements for tree selection and setback requirements
- To reduce cost and to minimize inconvenience to users, sidewalks should be incorporated during the initial planning stage of a transportation project.

7.4.1 Pedestrian Intersection Crossings

A. Marked Crosswalks

Marked crosswalks designate pedestrian and/or bicycle rights to cross a street at intersections and at mid-blocks. Texas State law defines and summarizes guidelines as it relates to crosswalks and the pedestrian right-of-way. The law defines "a marked crosswalk as a pedestrian crossing that is designated by surface markings and an unmarked crosswalk as an extension of a sidewalk across intersecting roadways." The State of Texas law recognizes both marked and unmarked crosswalks and makes no legal distinction between the two in assigning pedestrian right-of-way (Figure 7.41.1).

A mid-block crossing is a pedestrian crossing that is not located at a roadway intersection. If a mid-block crossing is not designated by marked crosswalks, pedestrians must yield the right-of-way to motorists (Figure 7.41.2).

An uncontrolled location is a roadway intersection or other mid-block crossing that is not controlled by either a traffic signal or a stop sign. Uncontrolled locations can be the most difficult and challenging places to provide safe pedestrian crossings.

When determining appropriate pedestrian crossings, it is found that quantitative criteria-based warrants, along with qualitative criteria and practical guidelines, should be studied to address unique problems in the community.

When providing a pedestrian crossing, proper signage should be considered in addition to marked crosswalks to improve safety and visibility. For example, at mid-block crossings, fluorescent green pedestrian crossing signage with lighted signs should be installed at crosswalks to ensure safe pedestrian crossing (Figure 7.41.4).

It is recommended that marked crosswalks should be 10 feet wide or the width of the approaching sidewalk, if it is greater. Textured crossings, using non-slip bricks or pavers, help raise a driver's awareness through increased noise and vibration. Marked crosswalks combined with curb extensions, illumination, and

Figure 7.41.1. Example of marked crosswalk.

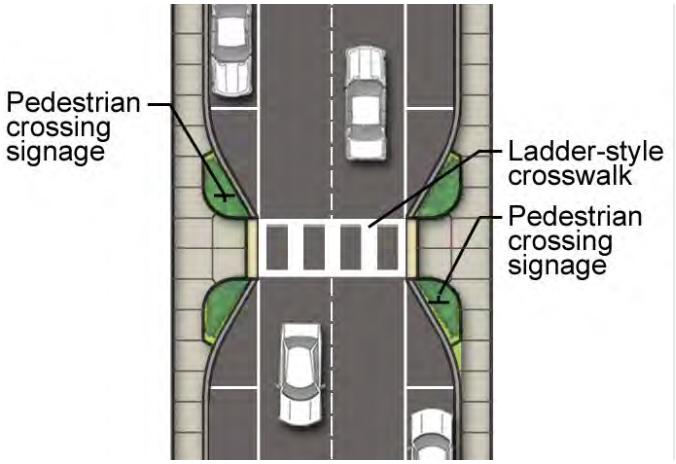


Figure 7.41.2. Typical mid-block crosswalk.

signage can improve the visibility of pedestrian crossings. Crosswalks send the message to motorists that they are entering a pedestrian area. A traffic study should be used to determine if a marked crosswalk will enhance pedestrian safety. This is usually in locations that are likely to receive high use, based on adjacent land uses.

Design Criteria:

- The design must meet and follow the City of Arlington Design Criteria Manual, Chapter 6 and MUTCD standards and information on pedestrian crossing signage and crosswalk markings.
- Use thermoplastic markings that are highly reflective for crosswalks.
- Crosswalks shall have a minimum 10-foot width.
- Appropriate push buttons and walk signals should be placed at signalized intersections indicating when pedestrians may cross.
- Adequate street lighting shall be provided at crosswalks.

- Mid-block crosswalks can be considered in a controlled environment with speeds less than 35 mph, after a traffic study has been provided and the City Engineer has approved them.
- For quantitative guidance on marked crosswalks at uncontrolled locations, see the 2005 FHWA Safety Effects of Marked Versus Unmarked Crosswalks at Uncontrolled Locations Final Report and Recommended Guidelines (www.fhwa.dot.gov/publications/research/safety/04100/04.cfm#toc110157073).
- Provide high-intensity activated crosswalk (HAWK) system when providing mid-block crossings (Figure 7.41.4). HAWK signals are applied to intersections or mid-block crossings with low vehicular volumes where bicyclists and/or pedestrians have difficulty obtaining adequate gaps in major street traffic to safely cross the street. These signal faces will rest in an off condition until a bicyclist and/or pedestrian activates a control sequence. After flashing yellow and/or steady yellow change intervals, the red lenses will first display steady red, followed by a simultaneous flashing red display. The bicyclist or pedestrian then follows standard crossing signals with a countdown crossing signal and "do not cross" signal.

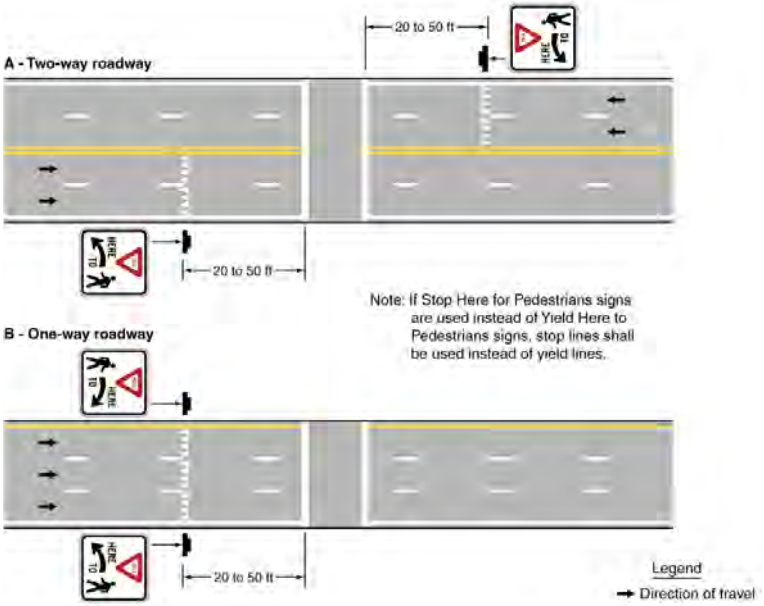


Figure 7.41.3. Typical signage placement for mid-block crosswalks.

- Crosswalks should be used where substantial pedestrian and vehicular conflicts exist and not used indiscriminately.
- Crosswalks should be used at appropriate points of pedestrian concentration or where pedestrians could not otherwise recognize the proper place to cross (e.g. loading islands, mid-block pedestrian crossing).
- Crosswalks may be provided to concentrate or channelize multiple pedestrian crossings to a single location.
- Crosswalks should be utilized at approved school crossings on recommended safe school routes.
- Advance warning signs for motorists should be installed for mid-block crossings.
- Continental or ladder style high-visibility marked crosswalks are preferred.
- If possible, the crossing distance should be minimized by using curb extensions.
- Median refuge islands should be considered, especially for high-volume and/or multi-lane roadways.
- Signal timing patterns should be adjusted to minimize pedestrian conflicts with right or left turning vehicles.
- Visibility should be enhanced for motorists to recognize pedestrians and yield the right-of-way.
- On-street parking should be removed or minimized in the immediate proximity of an intersection. These locations provide an ideal location for a curb extension.

Figure 7.41.4. Typical signage placement for mid-block crosswalks.

- Pedestrian activated (or passive detection) flashers should be considered in addition to overhead signage.
- Motorist speeds should be reduced and controlled at crosswalks locations.
- Crosswalks should not be installed at locations which could present an increased safety risk to pedestrians, such as locations with poor sight distance, complex or confusing designs, substantial volumes of heavy truck traffic, or other dangers without first providing adequate design features and/or traffic control devices.

B. Advanced Stop Bars

Located at all signalized intersections and at multi-way stops, advanced stop bars are used to provide warning for automobiles that a pedestrian zone is approaching. Advanced stop bars are located on roadway pavement in advance of the crosswalk to prevent automobiles from encroaching on the pedestrian zone.

Design Criteria:

- Advanced stop bars should be placed 4 feet in advance of any marked crosswalks.
- The advanced stop bar should be a 24 inch wide white line across the length of the travel lane(s).
- See Arlington Design Criteria Manual for additional information regarding advance stop bar design requirements.

C. Curb Extensions

Curb extensions are often used as traffic calming devices in high pedestrian areas. Typically installed at curb radii, these are also known as bulbouts or neck downs and they reduce distance for pedestrians to cross streets. This improves pedestrian safety and slows turning vehicle movement. Curb extensions can be used on one side of a one-way street radius and at mid-block crossings where pedestrian traffic is high, such as in downtowns or on main streets. Curb extensions should be considered at all intersections where on-street parking is allowed. Curb extensions improve visibility of pedestrians by motorists. This visibility can be further improved with lighting and signage.

Design Criteria:

- Refer to the Thoroughfare Development Plan for minimum travel lane width.
- Maintain appropriate travel lane widths. Refer to the City of Arlington's Thoroughfare Development Plan.
- Provide ADA accessibility ramps at crosswalk locations.
- Follow MUTCD standards for signage and traffic markings for advance warning of curb extensions.
- Maintain pedestrian and vehicle visibility and sign distance.
- Line up sidewalks, curb cuts, and crosswalks at intersections.
- Average daily traffic (ADT) on the affected street should be between 800 and 3,500 .
- Street must be at least 750 feet long and must have existing curbs and an asphalt width of 22 feet.
- The speed limit may not be greater than 25 mph.
- Adequate provisions for emergency vehicles must be provided.
- The curb extension is best applied on local and minor collector streets.
- The curb extension is best used in conjunction with features such as textured or highly visible crosswalks, raised intersections, median refuge islands, or on-street parking.
- Curb extensions may require additional drainage provisions.
- Bollards or other landscape improvements can be used with curb extensions to provide pedestrian safety and visual enhancements.

D. Curb Ramps

Curb ramps are important devices at intersections because they facilitate crossing for wheelchair users, people pushing strollers, bicyclists, and others. Curb ramps provide transition areas from street to sidewalk where a raised curb is located (Figure 7.41.5).

Design Criteria:

- The curb ramp must meet American with Disabilities Act (ADA) standards.
- The minimum width for exterior ramps is 5 feet.
- A minimum of 4 feet (5 feet preferred) should be provided at the top of the ramp for turning or bypassing the ramp.
- Ramp and approaches shall be clear of obstacles, such as fire hydrants, poles, and inlets.
- A level landing area should be provided at both ends of the curb ramp to provide a resting zone for users.
- The low end of the ramp or curb cut should meet the grade of the street with a smooth transition.
- Curb ramps shall be provided at channelization islands in an intersection and median refuge island, unless the full cut through openings are provided at grade with the street.
- Curb ramp surfaces should be textured to meet ADA standards and to prevent slippage (Figure 7.41.6).
- Provide detectable warning pavement or pavers (truncated dome) at the bottom of the ramp.
- Good drainage at intersection corners is important so that standing water does not accumulate within the crossing area.
- Storm drainage inlets should be placed on the uphill side of the crosswalks and outside the crosswalk area.

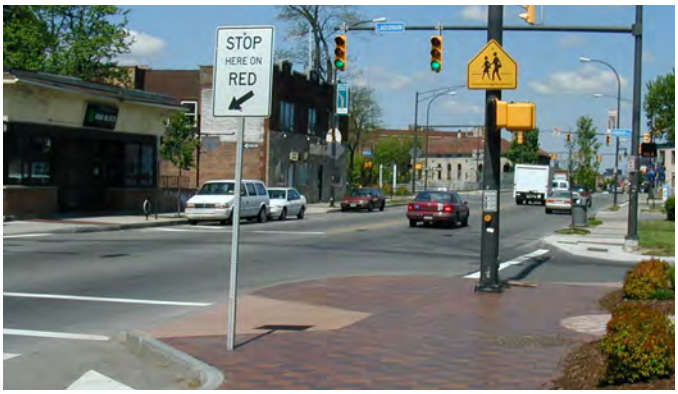


Figure 7.41.5. The curb ramps below are aligned with the marked crosswalk and are ideally perpendicular to the roadway

Figure 7.41.6. The curb ramp with detectable warning strip at intersection.

E. Islands and Refuges

Pedestrian refuge islands are typically raised islands located along the centerline of a street. They are typically constructed at wide intersections with several travel lanes and turn lanes. Refuge islands allow pedestrians to cross fewer lanes at one time and should be wide enough to hold several pedestrians at once (Figures 7.41.7 and 7.41.8).

Design Criteria:

- Refuge islands should be a minimum of t least 6 feet wide (preferably 8 feet).
- An area should be provided for accessible pedestrian push-buttons.
- Vehicular and pedestrian visibility should be maintained if landscape enhancements are provided in the refuge area.
- On narrow islands (6 feet wide) bollards should be installed for added protection for waiting pedestrians.
- For narrow refuge islands, at-grade cuts are needed for wheelchair access.
- For wider islands, curb ramps with level landings are needed.
- Refuge islands are best applied on wide streets (four or more lanes) with moderate

to high traffic volumes.

- Refuge islands should be considered at locations where slower pedestrians are commonplace, or where it is difficult to cross more than one direction of traffic during one pedestrian crossing phase.
- Refuge islands should be considered to help reduce vehicle speeds or to make pedestrian crossings more visible to motorists.
- Refuge islands should be considered as a location for landscaping and visual enhancements.

Figure 7.41.7. Median refuge island with pedestrian signage at intersection.

Figure 7.41.8. Refuge island with pedestrian activated signalization at intersection.

F. Pedestrian Signals

There are a variety of possible traffic signal enhancement opportunities that can greatly improve the safety and flow of pedestrian traffic. A pedestrian activated signal may be warranted where the expected number of people needing to cross a roadway at a particular location is significant. Pedestrian signals are often combined with other traffic calming devices to ensure pedestrian safety is maintained when crossing a street. The preferred location for pedestrian signals are at intersections where pedestrian crossings are common. Sight-distance must be adequate to ensure that motorists will see the light in time to stop. Warning signs should be installed at warranted locations (Figure 7.41.9).

Design Criteria:

- Signals must meet City of Arlington standards.
- Adequate and proper signage, markings, clear zone, and lighting are required to allow motorists time to see the pedestrian signal.
- Countdown signals are required for all new signal installations. If existing countdown signals already exist, they must meet the provisions established (in 2003) by MUTCD, indicating that by 2013, any hardware that does not meet the standards will need to be replaced. With the adoption of special provisions in the 2009 MUTCD, any new countdowns installed from now forward must meet not only hardware requirements, but the new requirement that any new replacement pedestrian signals being installed must include countdowns unless the pedestrian change interval (flashing upraised hand) is 7 seconds or less (Figure 7.41.9).
- Proper signal timing intervals and timing needs should be adapted to the given situation.
- Large pedestrian signals should be utilized on larger roads to ensure readability.
- Pedestrian signal push buttons should be well signed and visible.

Figure 7.41.9. Examples of typical pedestrian crossing signal and countdown signal.

- Pedestrian signal push buttons should clearly indicate which crossing direction they control (Figure 7.41.10).
- Pedestrian signal push buttons should be reachable from a flat surface, at a maximum height of 3.5 feet.
- Walk intervals shall be provided during every traffic light cycle, especially in high pedestrian traffic areas.
- Where high-volume motorist turning movements conflict with pedestrians, an exclusive pedestrian interval is a preferred solution.
- A potential alternative to the exclusive pedestrian crossing is the leading pedestrian interval, which works in conjunction with the concurrent signal timing system and provides an advance signal notice to pedestrians.
- In addition to appropriate symbols, pedestrian signalization can be accompanied by an audible pulse or other messages to make crossings safe for all pedestrians.

Figure 7.41.10 Push-button activator for intersection crossing.

G. Underpass/Overpass

Pedestrian underpasses and overpasses provide the opportunity to design and construct a continuous hike and bike network.

Underpasses provide the opportunity to pass beneath existing bridges and though culverts to avoid slopes, railroad, and/or roadway conflicts (Figure 7.41.11).

Overpasses provide the opportunity for safe passage over streams, rivers, wetlands, slopes, railroads, and/or roadways. They can also provide a unique vantage point from which to view the surrounding environment. Both structures can be costly to design and implement

Refer to Section 7.53, Bicycle Intersection Crossing Facilities for Design Criteria and Other Design Considerations for the design of Pedestrian Underpasses/Overpasses.

Figure 7.41.11. Example of multi-use underpass.

H. Pedestrian Railroad Crossings

Refer to Section 7.53 Bicycle Intersection Crossings for Design Criteria and Other Design Considerations for the design of Pedestrian Railroad Crossings (Figure 7.41.12).

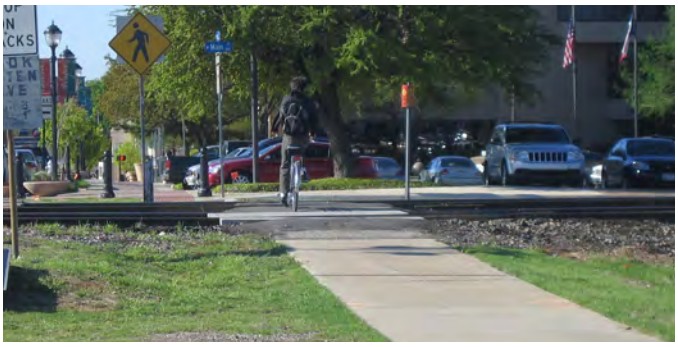


Figure 7.41.12. Center Street sidewalk in downtown Arlington shows how pedestrian signage is used at railroad crossing.

7.4.2 Transit Stop Treatment

Transit stops serve as the interface between points of the sidewalk/trail system, street networks, and transit routes. Treatment at transit stops is important to ensure pedestrian safety and to encourage continued use of the transit facility. An improved pedestrian system connecting to transit stops will make using the transit system safer and more enjoyable. The treatment should include comfortable site furnishings, including shelters, benches, waste receptacles, bike racks, lighting, landscaping, adequate buffering from the road, and wider pavement surfaces.

Transit facilities function best when they are designed to meet the demands of the peak user levels. In high use areas, transit stops require significantly wider sidewalk areas to accommodate users, transit shelters, clear zone areas, bike racks and storage, and waiting areas (Figure 7.42.1).

Appropriately located turnouts will enhance user safety while minimizing delay to traffic. For a transit pullout along a street, exiting and boarding passengers should not conflict with the needs of pedestrians and bicyclists moving through the area (Figure 7.42.2).

Figure 7.42.1. Transit stop transit shelter near curb extension at intersection. Passengers can board or dismount the transit directly onto sidewalk without stepping into the street.

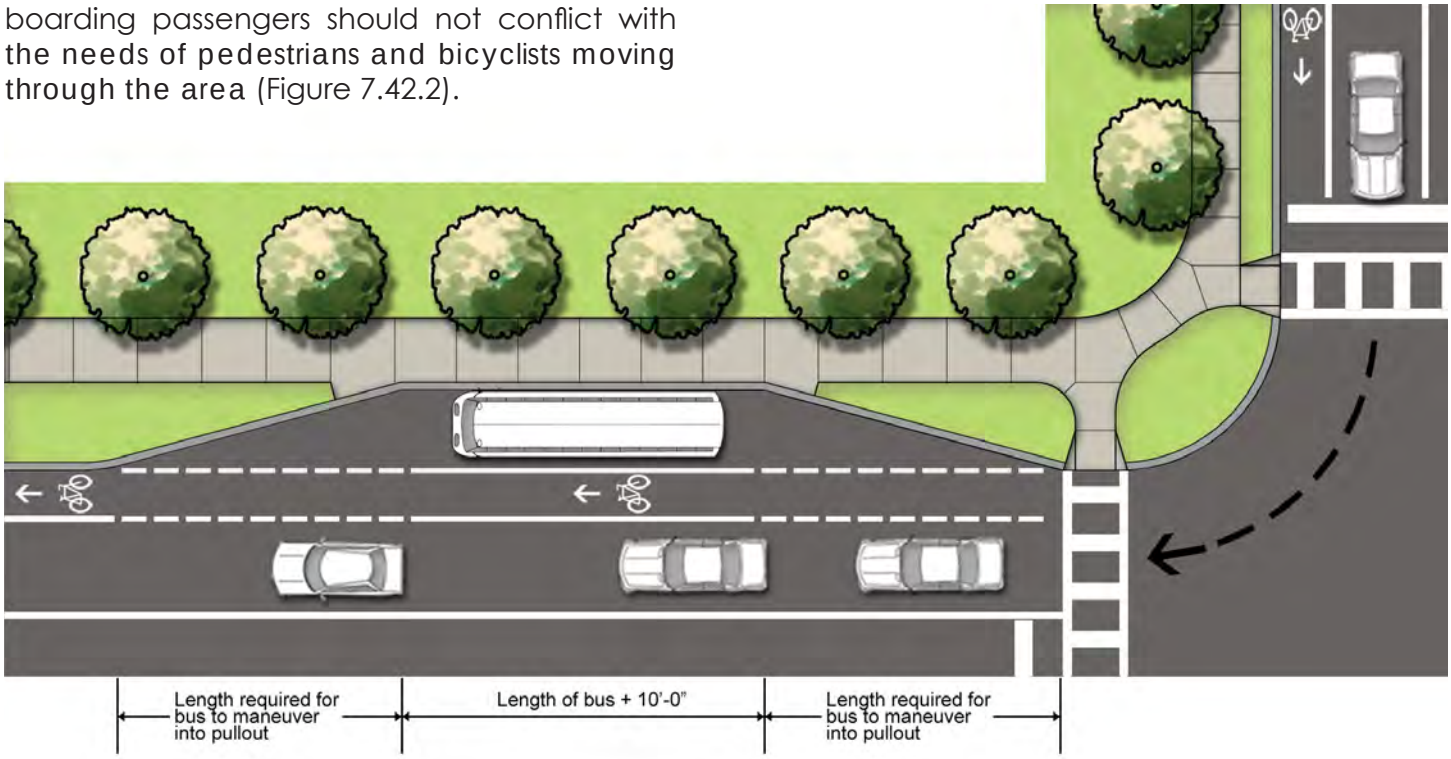


Figure 7.42.2. Transit stop transit lane pullout treatment at intersection does not interrupt the bike lane or travel lanes while transit vehicle is loading/unloading.

Design Criteria:

- The transit stop treatment should meet ADA accessibility requirements.
- Where transit stops warrant a pullout location due to high traffic conditions, a minimum of 8-foot-wide sidewalk pavement, the length of a regular transit vehicle, shall be provided.
- In addition to the sidewalk width, provide a landing pad or additional pavement area for loading and unloading for transit passengers. Landing area is 10 feet by 5 feet minimum.
- A minimum 4-foot clear zone should be provided so transit vehicle doors can open fully.
- Non-slip pavement surface should be provided for all loading and unloading areas.
- Benches, shelters, waste receptacles, and lighting should be provided at each stop.
- Benches shall not be located closer than 5 feet to the curb where speed limits are 35 mph or less, 10 feet from the curb where speed limits are greater than 35 mph, and 10 feet where there is no curb.
- Refer to zoning and development codes for shelter placement. If no standards apply, shelter placement shall meet the minimum standards established for benches. Shelter location should not adversely impact vehicular sight visibility and/or adjacent residence or business use.
- Transit stops shall be signed.
- Route and schedule information should be provided along with a location map.
- Transit stop design shall avoid conflicts with bike lanes.
- Curb extensions or bulbouts should be considered to allow passengers to board and exit transit vehicle without conflict with the sidewalk pedestrian flow.
- Varying curb heights should be avoided.
- Stops located after (far side of intersection) or near intersections should be examined closely so that transit, traffic operations, and pedestrian conflicts are avoided.
- Transit operators need to be able to safely re-enter traffic. Sight distance and location site amenities are critical in transit stop design.
- At large transit facilities, bicycle racks, public telephones, and drinking fountains should be provided. At larger stops, storage facilities may also be warranted.
- Coordinate with the City of Arlington on the required site furnishing for each transit location.
- At high capacity centers, avoid drastic level changes. If stairs or elevators are provided, make sure they are wide enough to allow faster passengers to pass.

7.4.3 Pedestrian Lighting

Adequate pedestrian lighting is often a deterrent for any vandalism activity and provides safety for night-time hours. Lighting can also make pedestrians more visible when crossing a roadway and should be provided in addition to vehicular lighting. The light fixtures should be vandal-proof with the overall system requiring minimum maintenance (Figures 7.43.1 and 7.43.2).

Design Criteria:

- Lighting should be a minimum 4 feet from curb and 100 watt high pressure sodium light fixtures/LED.
- Light standards should be installed at all four corners of an intersection.
- Photometric studies must be conducted to ensure that the proposed lighting meets safety/visibility requirements.
- Poles shall be steel telescoping or decorative poles.
- Refer to the Arlington Design Criteria Manual for additional lighting information.
- Light standards should be provided between the back of curb and front edge of the walkway in the street furnishing zone.
- Light standards should be provided that are aesthetically appropriate for the overall architectural design style of the area that they are located within.
- Glare onto adjacent residential and private property should be avoided. Use full or partial cut-off lighting fixtures to minimize light pollution and address "dark skies" goals.
- Dual- level lighting systems should be considered to reduce intensity and power usage in later night to morning hours.
- Accent lighting should be provided and up-lighting on architectural and landscape features should be used to add interest and focal points.
- Electrical service for seasonal events and event lighting should be provided.

Figure 7.43.1. Pedestrian and street level lighting in downtown urban situation.

Figure 7.43.2. Pedestrian and street level lighting at commercial/office area.

7.5 BICYCLE NETWORK

Bicycle projects must be planned and constructed according to AASHTO, MUTCD, TxDOT, and City of Arlington Design Manual standards.

7.5.1 On-Road Bicycle System

A. Paved Shoulders

Paved shoulders are the area adjacent to the nearest travel lane and are at the same elevation as the street. Often used to accommodate disabled vehicles, paved shoulders allow bicyclists to use the roadway in a safe environment. Unless the minimum width for bike lanes and standards are met, paved shoulders should not be marked or designated as bikeways (Figures 7.51.1 through 7.51.3).

Shoulder widths can vary depending on the classification of the roadway (rural arterial, collector, local route, etc.), the design speed, and volume of traffic. Refer to City of Arlington and TxDOT for minimum shoulder width standards.

Design Criteria:

- Paved shoulders should be at least 4 feet wide to accommodate bike travel.
- Paved shoulders should be 5 feet wide from face fixed objects including guardrails, curbs, or barriers.
- Paved shoulders should be increased to 6-foot in roadways when there is a high percentages of truck, transit, recreational vehicles, obstructions, when vehicle speeds exceed 40 mph, or on steep grades in excess of 8 percent.
- Rumbled strips or raised pavement is not recommended unless there is a minimum clear path of 1 foot from the rumble strip to the traveled way.
- See AASHTO and Policy on Geometric Design of Highways and Streets (Green Book), for additional guidance.
- Many existing gravel shoulders have sufficient width and base to support bikeways.
- When providing additional pavement surface to existing roadways, the thickness of pavement and base material will depend on local conditions, engineering evaluation, and the specification provided by the City of Arlington Design Criteria Manual.
- It is best to widen shoulders in conjunction with pavement overlay to add structural strength to bike lane and provide a smooth, seamless joint. Cost can also be less due to larger quantities of paving materials that will be purchased and the benefit of minimized traffic disruption.

Figure 7.51.1 Paved shoulder at Bowman Springs Street bridge over I-20.

Figure 7.51.2. Paved shoulder at Mansfield Webb Road and Ballweg Road.

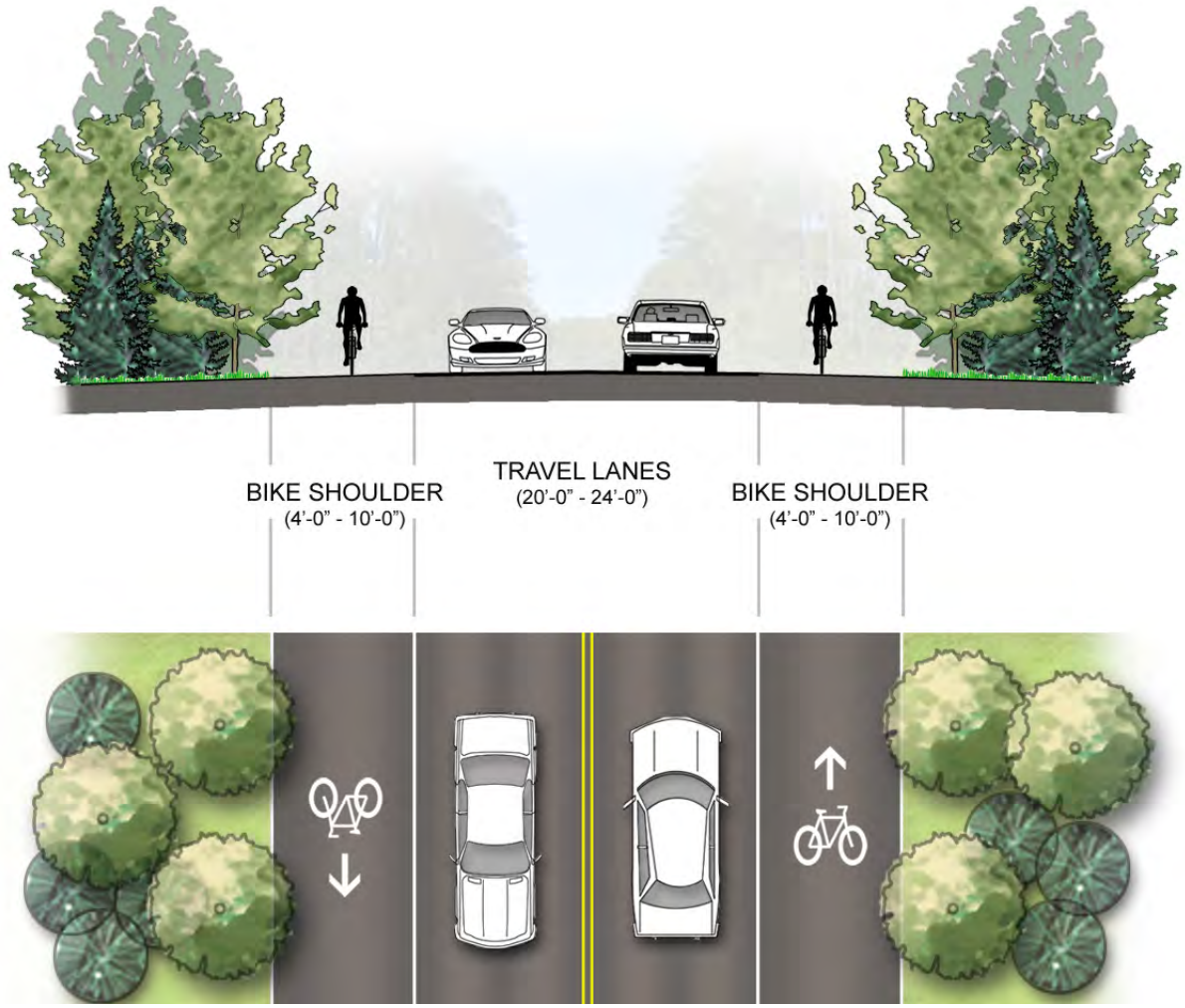


Figure 7.51.3. Typical section of paved shoulder facility.

B. Wide Outside Lane

For streets that do not have shoulders, a wide outside lane is preferred to safely accommodate bicyclists on a travel lane. In some instances, making travel lanes and left-turn lanes narrower to provide wide curb lanes that accommodate bicyclists may be considered, but should be supported by traffic and engineering studies (Figure 7.51.4).

Design Criteria:

- The minimum width for a wide outside lane is 14 feet for shared use from edge of gutter pan to edge of lane stripe.
- 16-foot lanes are desirable when drainage grates, raised reflectors, or on-street parking effectively reduces the usable width.
- Refer to MUTCD and ASSHTO standards for

Figure 7.51.4. Wide two lane road above provides ample space for a bicyclist to be separated from traffic.

"Share The Road" signage and pavement markings.

- See AASHTO and Policy on Geometric Design of Highways and Streets (Green Book), for additional guidance.
- When widths greater than 14 feet extend continuously along a stretch of roadway, they often encourage the undesirable operation of two motor vehicles in one lane. Consider striping bike lanes and shoulders when pavement widths are greater than 14 feet.

C. Signed, Marked Bike Route

A signed, marked bike route is a bicycle facility that allows both bicyclists and motorists to use the same travel lane along a street.

Bike routes are designated by signs and markings as a preferred route for bicycle use and are typically recommended on lower-volume residential streets and minor collector roads with low traffic volumes and a speed limit of less than 35 miles per hour. They are often used where there is no room for a designated bike lane or on-street parking is necessary.

The shared lane pavement marking is used to 1) show bicyclists where in the the roadway lane they should ride, particularly in locations with on-street parallel parking to ensure safe bicycle travel outside parked vehicle door zones; 2) identify the proper direction of travel for bicyclists; and 3) create awareness for motorists that the travel lane is a shared use lane. (Figures 7.51.5 through 7.51.7).

Design Criteria:

- Provide a smooth roadway surface. Adjust utility covers, install bicycle-safe grates, and fill potholes as needed.
- Refer to MUTCD and AASHTO Standards for bike route and share the road signage.
- Refer to MUTCD and AASHTO Standards for share the road pavement markings.
- A shared lane marking shall include white paint markings indicating that the roadway

Figure 7.51.5. Example of shared lane markings

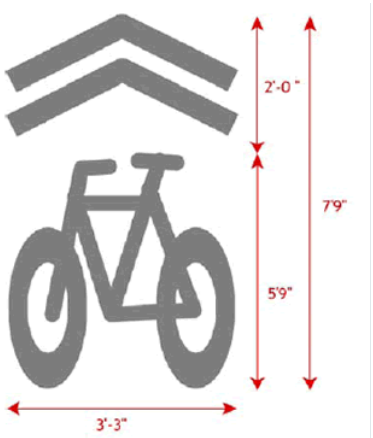


Figure 7.51.6. Shared Lane Stencil Dimensionss

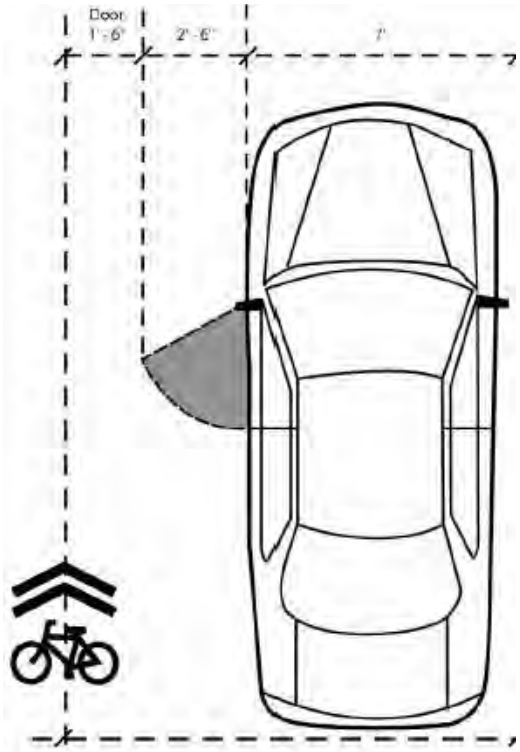


Figure 7.51.7. Shared lane dimensions for on-street parking.

Figure 7.51.8. Example of a signed shared roadway.

is shared by both bicyclists and motorists.

- When a bike route is provided adjacent to parallel parking, the appropriate "share the road" signage is required to inform motorists that the travel lane is shared among vehicles and bicyclists and the minimum combined lane width shall be 14'-0" (Figure 7.51.8).
- Arrows should be spaced approximately 200 feet on center, with the first arrow on each block or roadway segment placed no further than 100 feet from the nearest intersection.
- When a shared lane is greater than 16'-0" wide, a bike lane shall be striped to avoid undesirable operation of two motor vehicles in one lane.
- The signed shared roadway should direct bicyclists to other bicycle facilities.
- Signage should direct bicyclists to particular destinations such as parks, schools, or commercial districts.
- Where possible, the shoulder improvements and wider curb lanes can increase the comfort level of bicyclists using a shared lane facility.

Figure 7.51.9. Examples of Bike Route Signage

D. Bike Lanes

Bike lanes are portions of a roadway that have been designated by striping, signing, and pavement markings for the preferential or exclusive use of bicyclists. A bike lane is a one-way facility that carries bicycle traffic in the same direction as adjacent motorized traffic. Bike lanes should always be provided on both sides of a two-way street and should be located between on-street parking and travel lanes.

Bike lanes are typically provided on urban arterials and minor and major collector streets. Bike lanes may also be provided on rural roadways near urban areas, where there is a high potential of bicycle users. Bike lanes are not typically recommended on rural highways with greater than 45 mph post speeds.

Design Criteria:

- A bike lane requires a white pavement marking.
- The lane should be defined by a 6- to 8-inch-wide white line separating the bike lane from the motor vehicle travel lane.
- The lane should be defined by a 4-inch-wide white line separating the bike lane from parking spaces.
- The minimum width of a bike lane is 5 feet from center of stripe to face of curb or edge of pavement. 6'-0" bike lane widths are recommended for high use and high speed areas.
- Where on-street parking is permitted the bike lane should be a minimum of 6 feet wide. If traffic or parking volume is substantial or turn over is high, an additional 1 to 2 feet of bike lane width is desirable.
- Motorists are prohibited from using bike lanes.
- Where space is limited or a roadway has a steep grade, a bike lane may be used on the uphill portion and a sharrow may be used for the downhill portion of the roadway.
- Refer to City of Arlington's Design Criteria Manual, AASHTO, and MUTCD signage, pavement marking, and striping standards.

Figure 7.51.10.Example of clearly defined bicycle lane.

Figure 7.51.11. Example of a roadway where bike lanes are recommended and sufficient apace for striping a lane is available.

Figure 7.51.12. Example of bike lane and right turn lane.

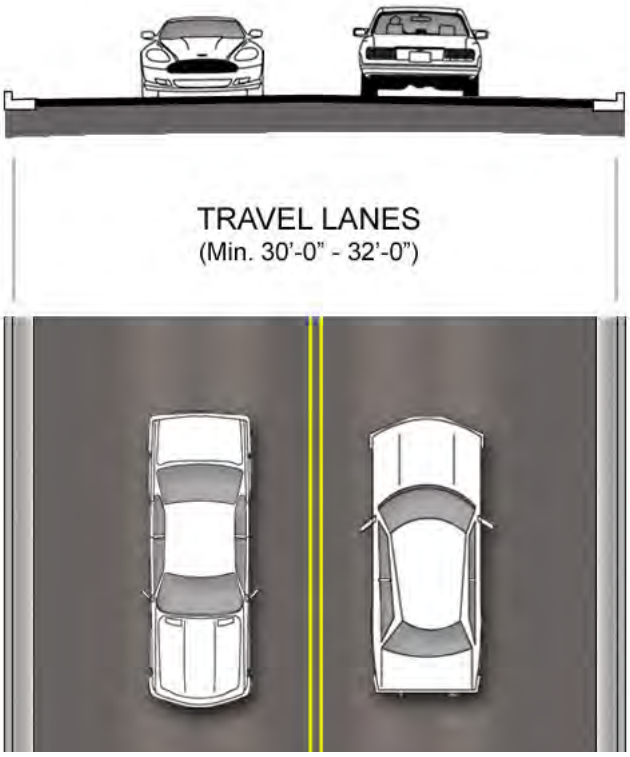
- R3-17 Bike Lane sign should be used for bike lane signage. Refer to MUTCD standards for bike lane signage placement and pavement marking placement.
- Refer to the Thoroughfare Development Plan for minimum bike lane width requirements.
- Bike lanes should never be placed between the parking lane and curb.
- Adjust drain inlets and utility covers that extend into bike lane.

E. Bike Lane (Stripe Implementation Method)

Bike lane striping allows for an existing, designated, wide outside lane to be used exclusively for bicyclists. In an existing wide travel lane, narrowing the travel lane by striping for a bike lane is used to accommodate bicyclists. This is a low cost solution that only involves adding striping and pavement markings (Figure 7.51.14).

Figure 7.51.13. Example of bike lane signage

Figure 7.51.14. Example of roadway where pavement striping could be added to create bike lanes.



Existing two lane street plan and section (before)

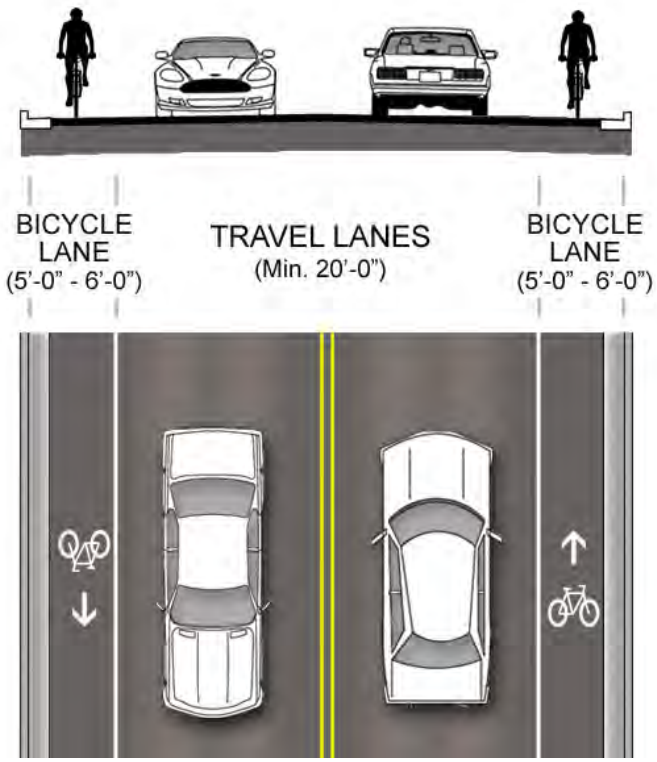


Figure 7.51.15. Two lane with bike striping plan and section (after)

F. Bike Lane (Travel Lane Conversion Implementation Method)

The travel lane conversion method involves a reduction in the number of travel lanes. Where future traffic volumes are expected to be low, a travel lane conversion is also recommended in this plan for four-lane divided roadways to convert to two lane divided roadways with bike lanes. Travel lane conversions can also include the reduction of four lanes to three lanes with center lane as turn lane to accommodate bike lanes (Figure 7.51.16 through 7.51.19).

Design Criteria:

- A traffic study is required to determine the feasibility of reducing the number of travel lanes.
- Examine the possibility of reducing the width of travel lanes or restripe if lanes cannot be eliminated.
- Refer to the City of Arlington Thoroughfare Development Plan and the Design Criteria

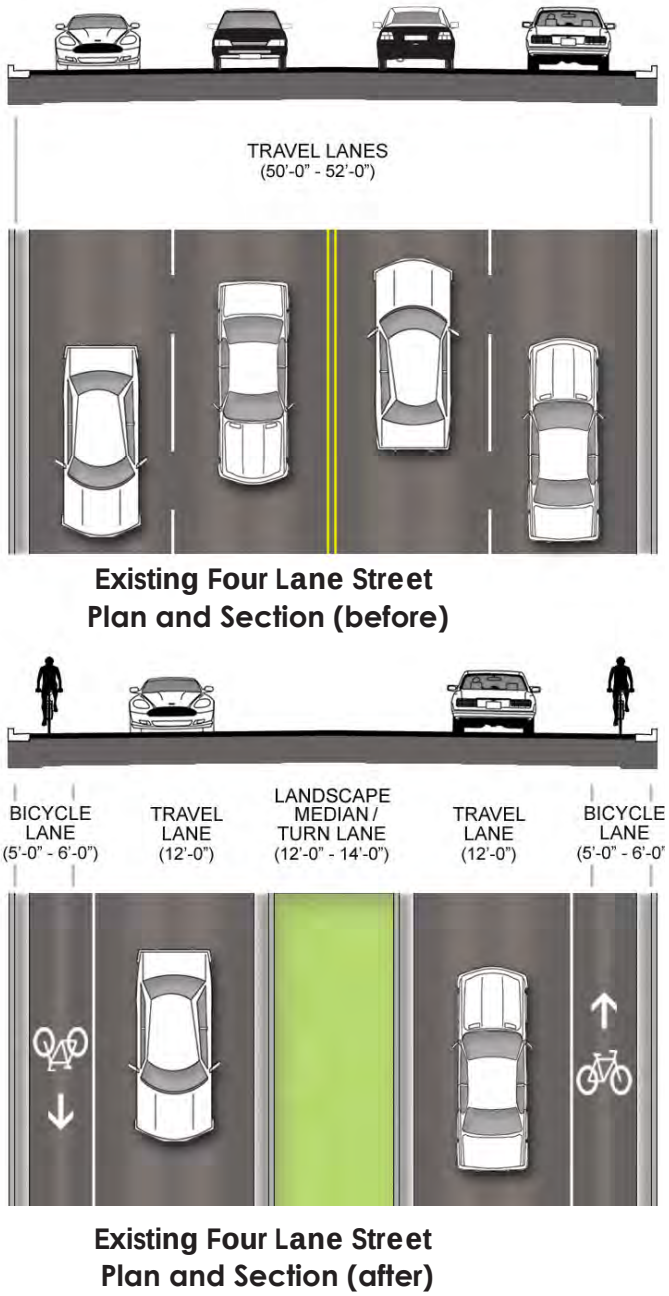


Figure 7.51.16. Bike lane road diet and restripe (four lanes to two lanes with median and bike lanes.

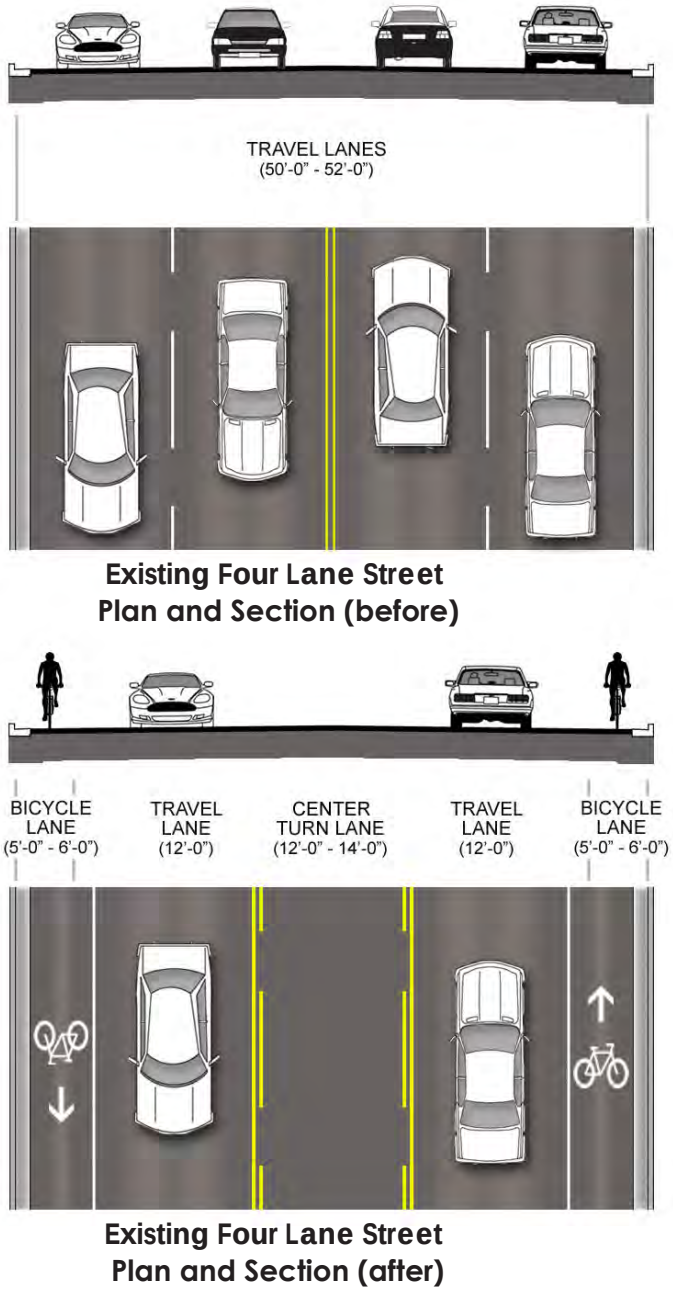


Figure 7.51.17 Two travel lanes, center turn lane, and bike lanes plan and section (after).

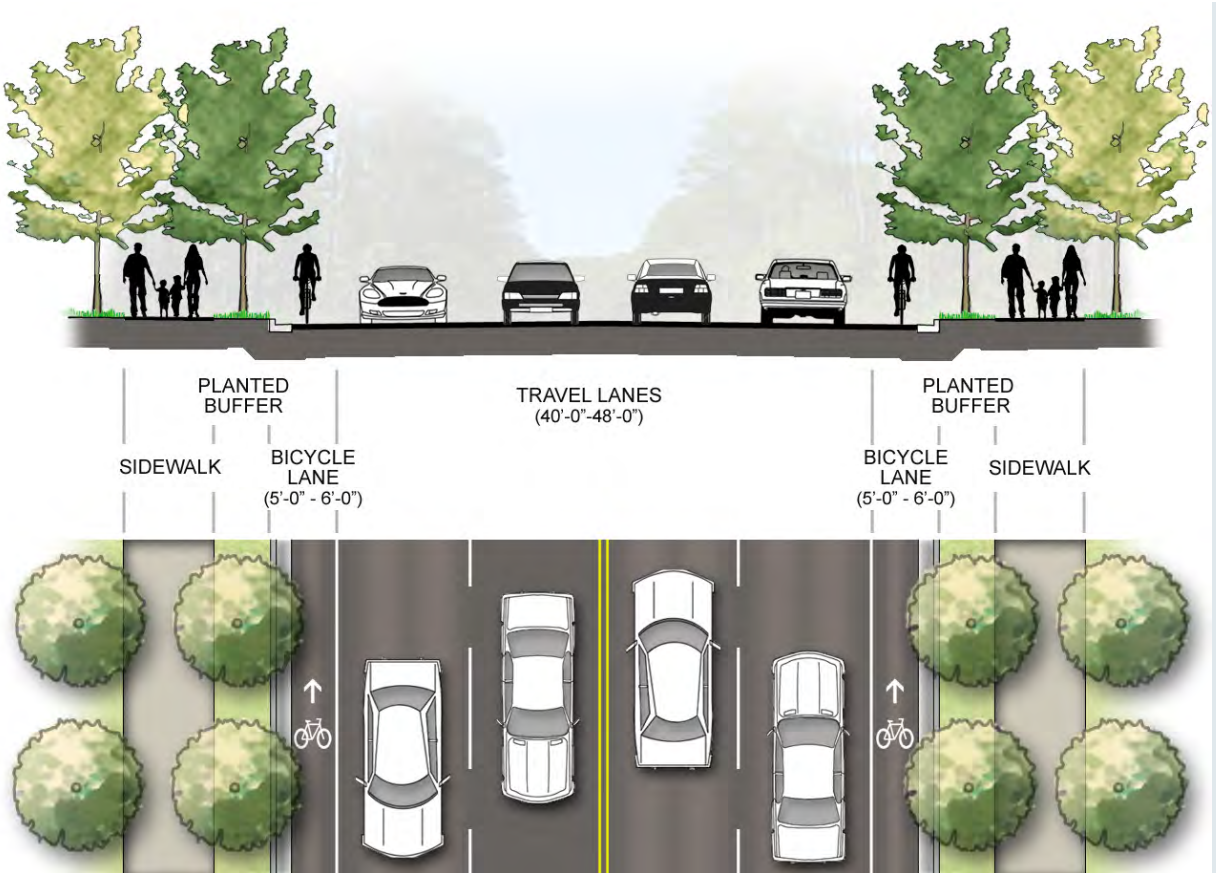


Figure 7.51.18. Four lane typical plan and section with bike lane.

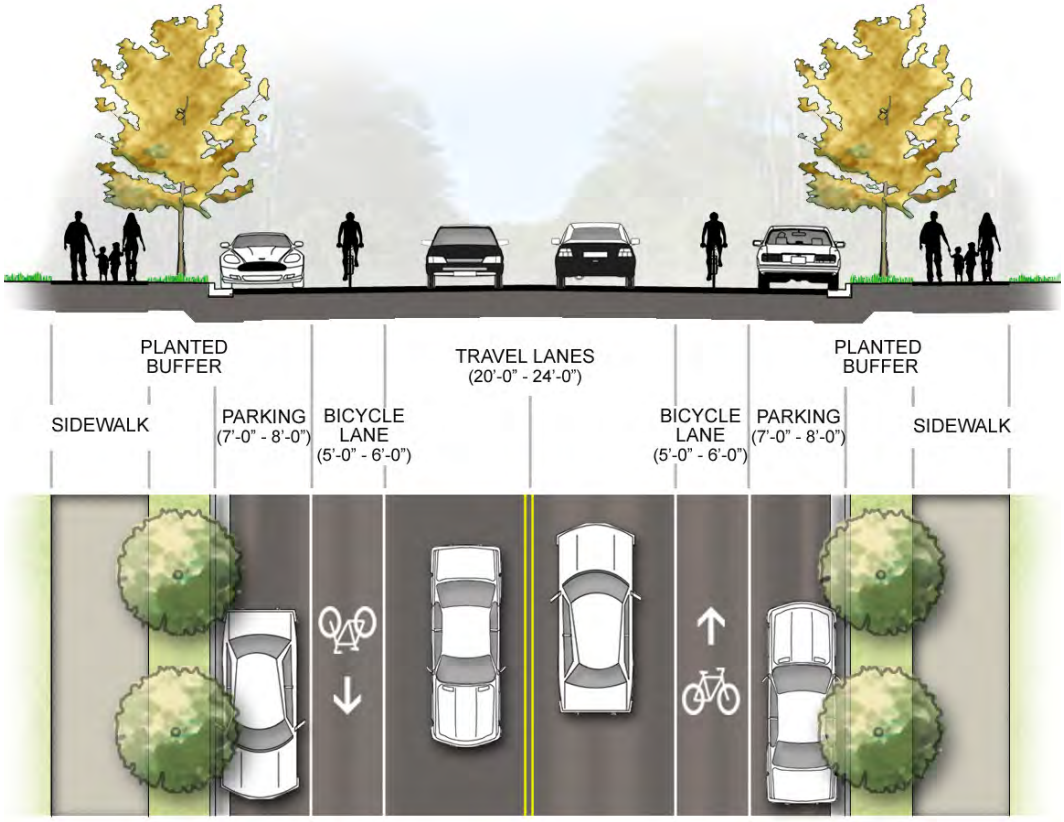


Figure 7.51.19. Two lane typical plan and section with bike lane & on street parking.

Manual to determine minimum lane width requirements.

- If the number of lanes or the lane width cannot be reduced and on-street parking exists, reexamine the need for on-street parking to accommodate bike lanes.
- Should angled parking exist, reconsider changing to parallel parking to accommodate bike lanes.

G. Bike Lane (Restripe Implementation Method)

A restripe of the roadway to incorporate bike lanes involves a reduction in the width, but not number of travel lanes (Figure 7.51.20).

Design Criteria:

- Depending on the roadway classification, narrow existing travel lanes to accommodate bicycle lanes.
- Bike lanes are a minimum of 5'-0".
- Provide pavement marking and signing on shoulders of bike lanes.
- On large traffic volume roads that have four or more lanes on streets that have a speed limit of 45 MPH or more, an off road / multi-use facility adjacent to the roadway should be utilized.
- With travel lane width reduction, reduced speeds are required.
- Consult with traffic engineer to determine if lane width reductions are feasible.
- Refer to AASHTO and the City of Arlington guidelines to determine if travel lane width is feasible without significantly affecting the safety operation of the roadway and surrounding roadways.

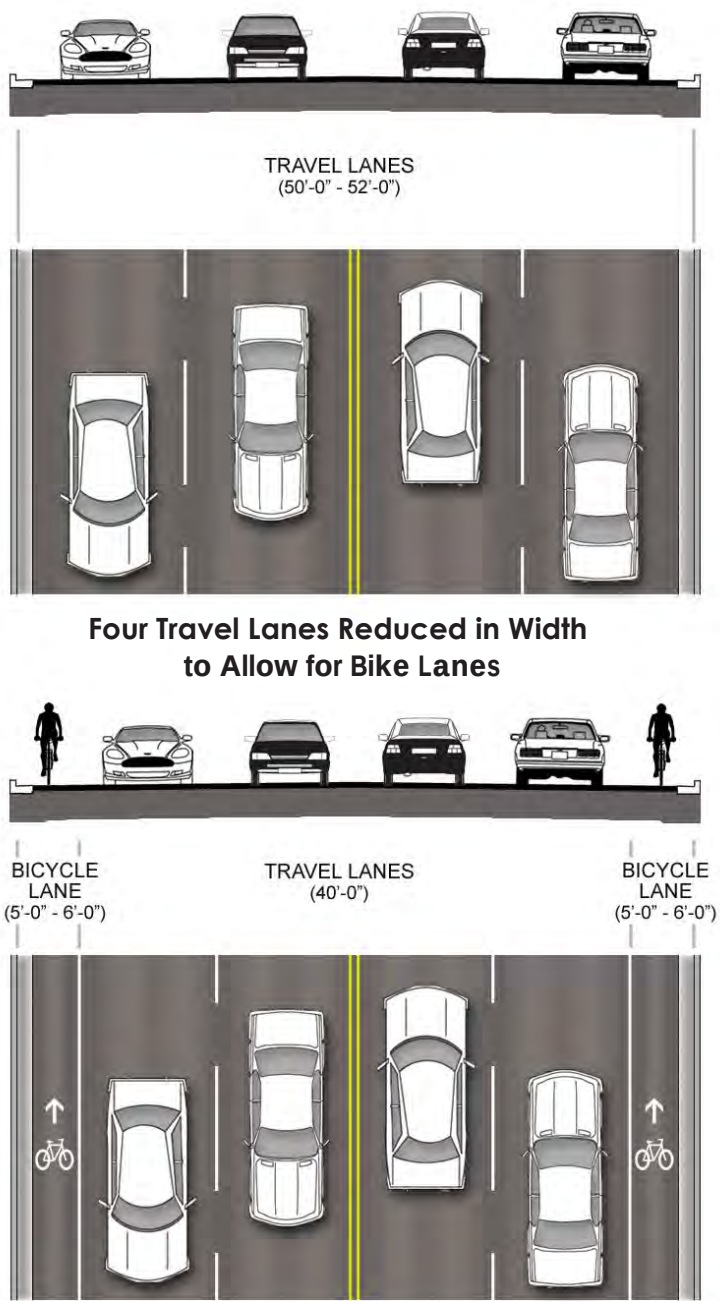


Figure 7.51.20. Bike lane restripe (narrowing travel lanes to add bike lanes)

H. Raised Bike Lanes

Raised bike lanes provide a psychological and physical separation between the bicyclists and the motorists using the street. They require a mountable curb to allow bicyclists to enter or leave the bike lane as needed for turning or passing. The mountable curb acts as a prevention for motorists entering the bike lane and provides a clear and strong, visible right-hand edge to the vehicle travel lanes. The raised bike lanes also experience less wear and tear than bike lanes at the same level as travel lanes. The raised bike lane should apply to limited urban environments. Raised bike lanes construction costs are mitigated by reduced long-term maintenance costs (Figures 7.51.21 to 7.51.23).

Design Criteria:

- Provide a mountable concrete curb or a 4:1 concrete slope left edge to the raised bike lane. The concrete edge shall be beveled at a maximum of 4:1 with a transition width of 1'-0" (3-inch rise in a 1-foot run).
- Raised bike lanes can be constructed of either concrete or asphalt.
- Minimum width of the raised bike lane is 6-foot.
- Drop the raised bike lane at intersections and handicapped ramps to meet ADA requirements.
- Provide signing and markings to comply with MUTCD and AASHTO standards.
- Provide 6-inch white lane markings to denote edge of raised bike lane.
- Provide color pavement markings at intersections to identify beginning and ending of raised bike lanes.
- Special attention needs to be provided to storm drainage measures.

Figure 7.51.21. Example of storm drainage with raised bike lane.

Figure 7.51.22. Example of transition between bike lane and raised bike lane along four lane street.

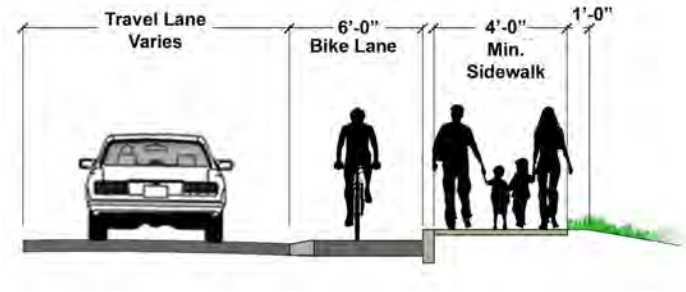


Figure 7.51.23. Section of raised bike lane.

I. Bike Boulevard

A bike boulevard is a shared roadway which has been optimized for bicycle traffic. It is designed to give priority to bicyclists and encourage regular use of bicycles by both the experienced and the novice, including children. They allow experienced bicyclists to enjoy lower traffic without significant increases in trip time, while less experienced bicyclists can use them as a "training ground" to help them move to other shared roadway (Figure 7.51.24).

Design Criteria:

- Access to private property, emergency services access, and impact on traffic patterns needs to be addressed prior to implementation.
- Bike boulevards should be considered when motor vehicle volumes are less than 3,000 – 4,000 vehicles per day; 1,500 vehicle trips per day are preferred.
- Vehicle speed should be 25 mph or less. The ideal speed is 15 - 20 mph. In general, a speed differential between motorists and cyclists of no more than 15 mph is desirable.
- Provide bike boulevard signage and pavement markings to serve as wayfinding devices and reinforce that bicyclists are on the preferred route.
- Install traffic calming devices such as chokers and bulbouts at corners to limit motor vehicles from entering bicycle boulevard and encroach traffic calming.
- Remove parking at intersections to ensure adequate sight distance.
- Provide large pavement markings (30" L x 60" w) at each intersection location to indicate and reinforce the message to motorists they are on a street prioritized for cyclists.
- Refer to MUTCD and AASHTO devices for pavement signing and markings, intersection treatment, and general application of pavement wording and symbols for on-road bicycle facilities.
- Install stop signs or signals on intersecting streets so bicyclists can ride free with few interruptions.
- Refer to Figure 7.51.26 for an appropriate mix of design elements for a bicycle boulevard development along a particular corridor.
- Refer to http://www.ibpi.usp.pdx.edu/media/BicycleBoulevardGuidebook.pdf
- Provide protection on bike boulevards where high volume arterials cross with signals or medians refuge improvements.
- Failure to provide arterial crossing improvements can result in unsafe conditions for bicyclists.
- If bike boulevards are improperly implemented, they can cause traffic diversions and congestion on other streets.

Figure 7.51.24. Example of bike boulevard

Bicycle Boulevard Lane Configuration

Bicycle boulevard alignments are selected primarily based on connectivity that can be provided to key destinations, the operational characteristics of the roadway corridor, or what may be achieved with their introduction (Figure 7.51.25).

Mix and match design elements to (Figure 7.51.25):

- Reduce or maintain low motor vehicle volumes.
- Reduce or maintain low motor vehicle speeds.
- Create a logical, direct, and continuous route.
- Create access to desired destinations.
- Create comfortable and safe intersection crossings.
- Reduce bicyclist delay.

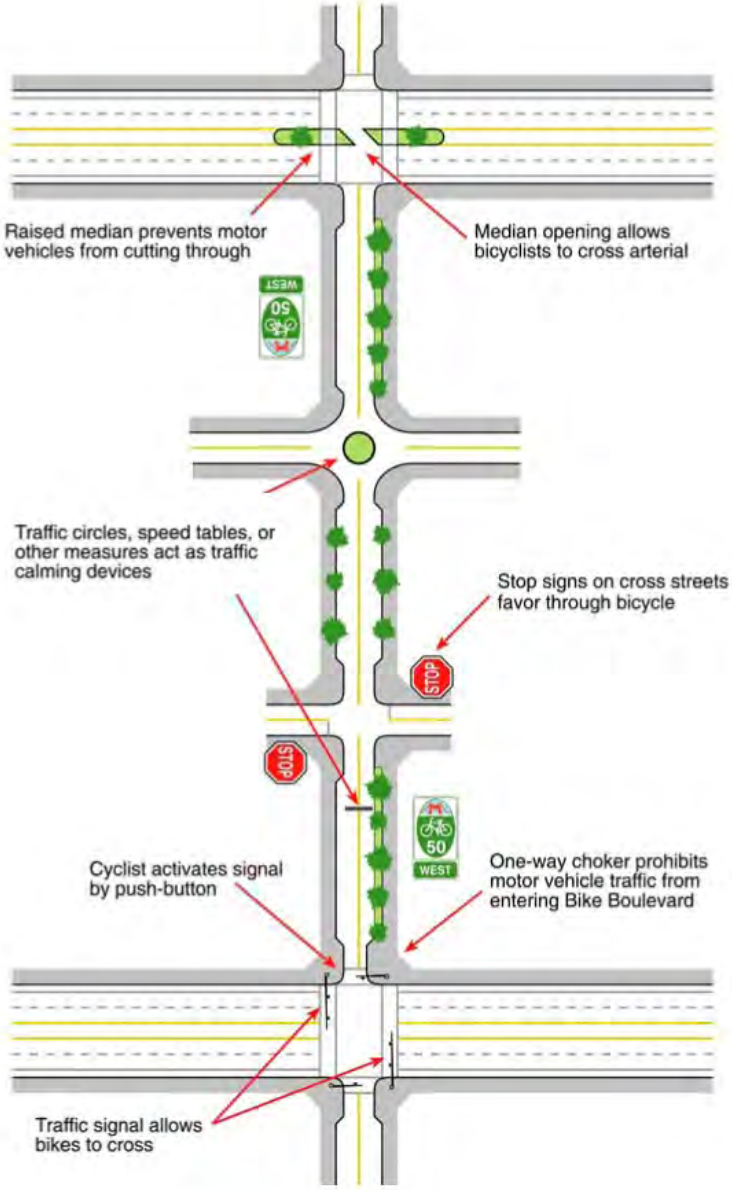


Figure 7.51.25. Typical bicycle boulevard lane configuration.

Figure 7.51.26. Design elements for bicycle boulevard.

J. Pavement Markings

The MUTCD provides guidance for lane delineations, intersection treatment, and general application of pavement wording and symbols for on-road bicycle facilities and off-road multi-use pathways. Refer to http://mutcd.fhwa.dot.gov/pdfs/millennium/12.18.00/9.pdf in addition to the standards presented in MUTCD. The following pavement markings may be considered (Figure 7.51.28).

Figure 7.51.27. Example of bike lane marking

Figure 7.51.29. Example of shared lane marking

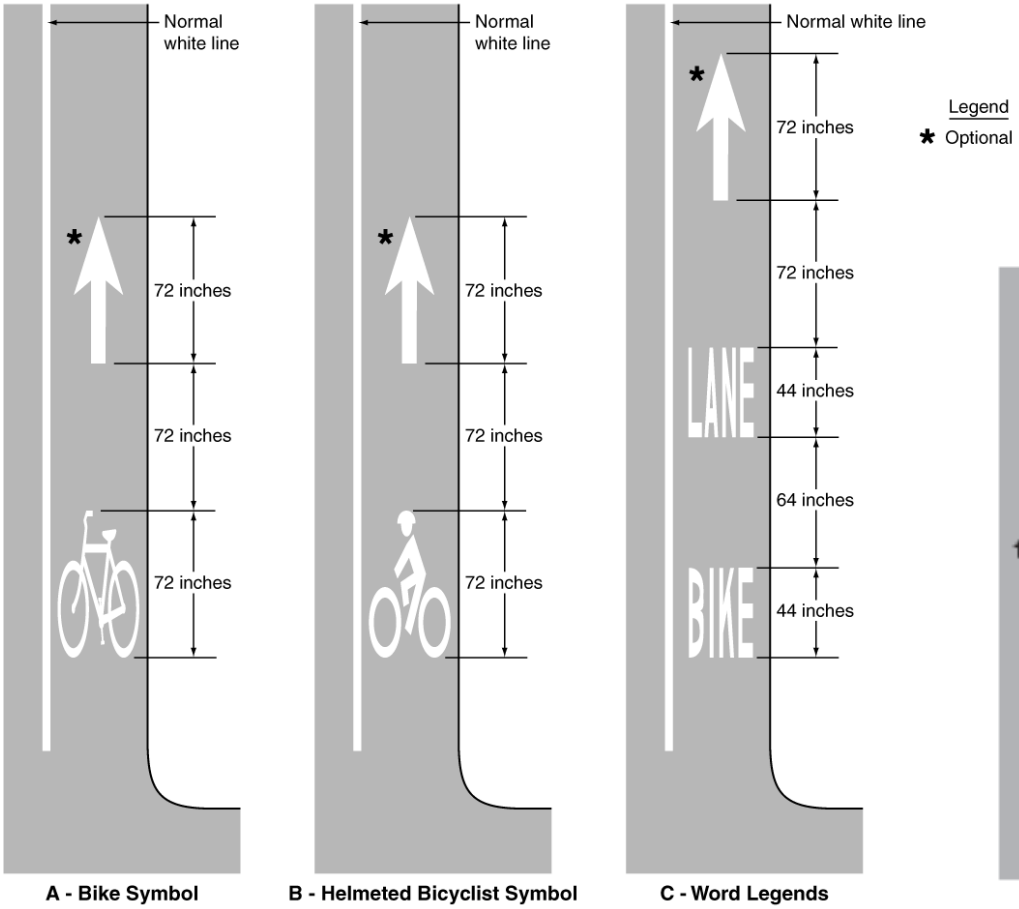


Figure 7.51.28.Examples of pavement markings.

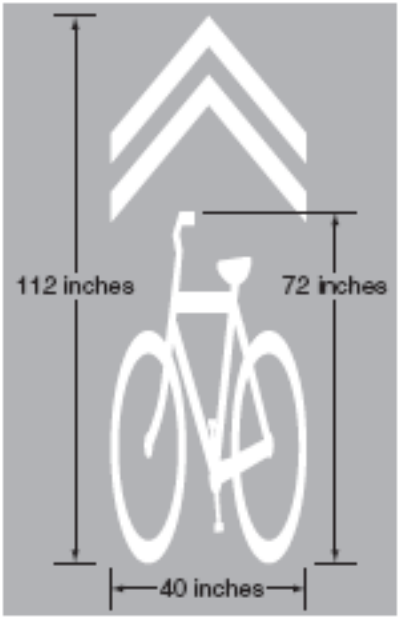


Figure 7.51.30.Shared Lane Marking

K. Bicycle Friendly Drainage Grates

Drainage grates are often located in the bike lane and can present a safety concern for bicyclists if the grates are improperly installed, clogged, or if the openings are too large. With proper planning during the design and street construction, these problems can be eliminated and a safe bicycle environment can be achieved (Figures 7.51.31 through 7.51.33).

Design Criteria:

- Bicycle-friendly drainage grates should be installed in all new roadway projects and problem grates should be identified and replaced in existing roadways where bicycle facilities are proposed.
- Drainage grates should be flush with adjacent pavement.
- Curb opening inlets should be considered in new street construction to minimize potential obstructions.
- Grates should be replaced with bicycle-safe, hydraulically efficient versions.

Figure 7.51.31. Bicycle friendly drainage grate.

Figure 7.51.32. Dangerous drainage grate conditions

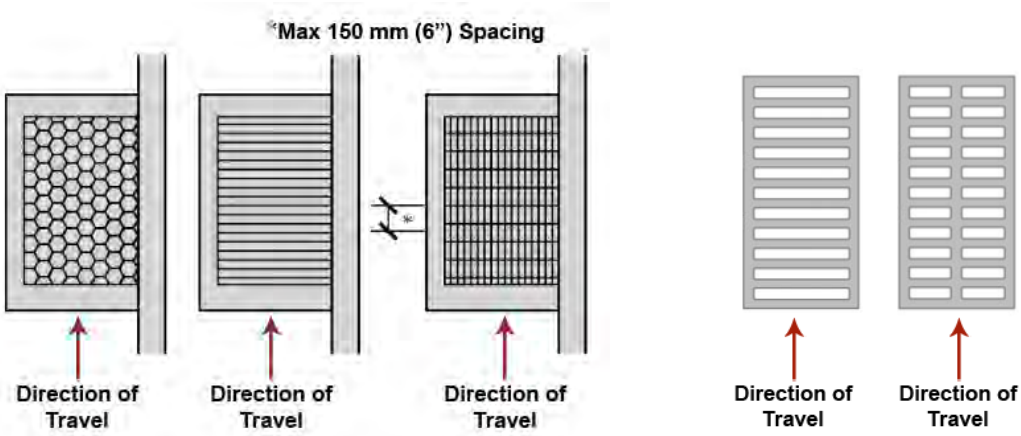


Figure 7.51.33. Bicycle friendly drainage grate designs.

7.5.2 Bicycle Intersection Crossing Facilities

The design of bike lanes at intersections is complicated by the need to accommodate numerous turning movements by both motor vehicles and bicyclists, often with limited available space. Intersections represent one of the primary conflict areas between motorists and bicyclists. Generally, the larger the intersection, the more difficult it is to cross safely.

The recommended designs are based on the assumption that motorists making right turns should make their turn from as close to the right-hand curb as practical; bicyclists going straight ahead shall be to the left of right turning traffic; and bicyclists turning left should turn from a left turn lane or as close to the centerline of the left side lane as practical. Proper pavement markings and signalization can help prevent future motorist and bicyclist accidents (Figure 7.52.1).

Figures 7.52.2 through 7.52.10 are typical occurrences. Refer to AASHTO Design Guidelines for further design requirements and guidance.

A. Bike lane at an uncontrolled intersection:

- Bike lane stripes typically are not extended through a pedestrian crosswalk or any street intersection (with the exception of dashed lines, which is optional through some intersections).

Figure 7.52.1. Bicycle traffic signal can be used in combination with other traffic signals.

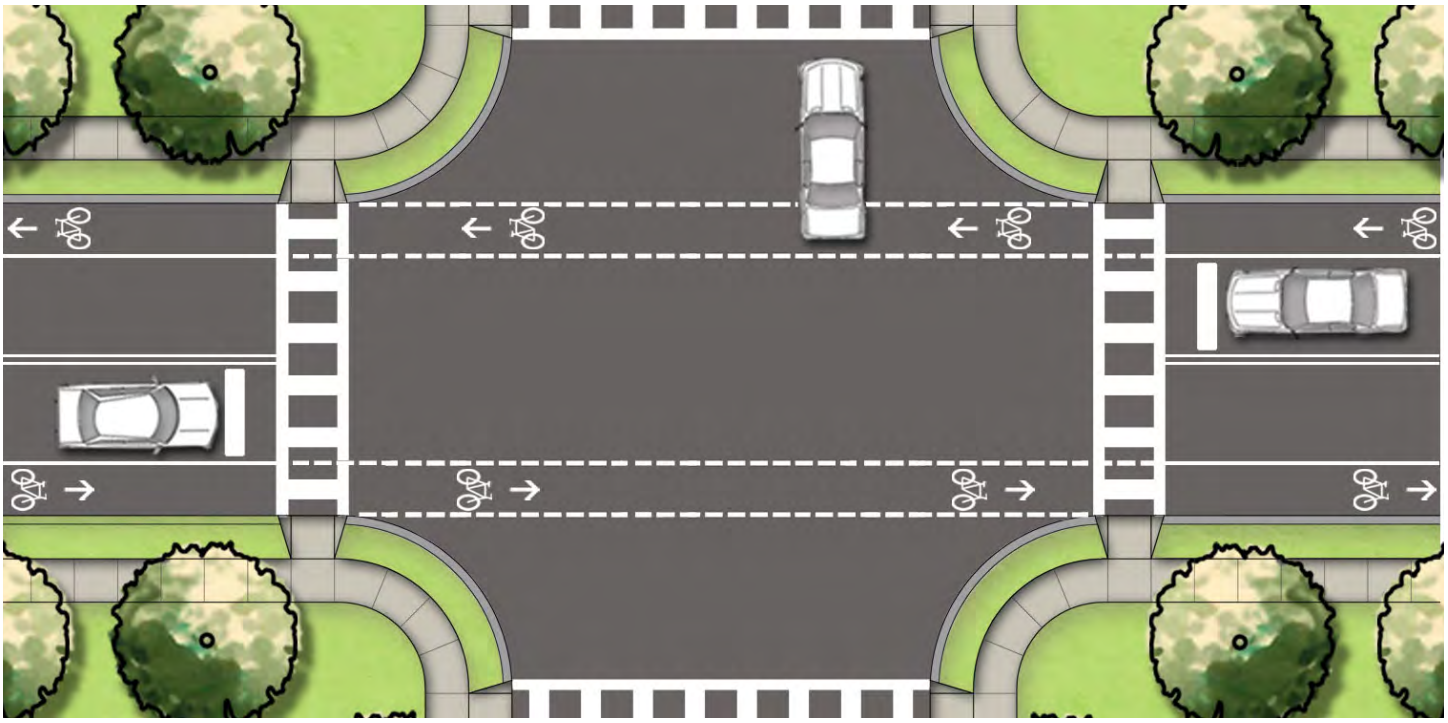


Figure 7.52.2. Example of bike lane markings at an uncontrolled intersection.

B. Bike lane at a controlled intersection:

- A bike lane stripe should end at the stop line or crosswalk with right turning traffic (Figure 7.52.3).
- Bike lanes should not be striped through controlled intersections, except with complex intersections where dash lines are acceptable (optional) (Figure 7.52.8).

C. Bike lane at intersection with right turn lane:

- Bicyclists going straight ahead shall be positioned to the left of right turning traffic, and bicycle lanes should not be marked on streets with multiple right turn lanes.
- Refer to Figure 7.52.3 from the AASHTO Guide for the Development of Bicycle Facilities, 3rd Edition for bike lane design, approaching right-turn only lane alternatives.
- Refer to Figure 7.52.3 to 7.52.9 for typical bike lane signing and marking associated with right turn lane movements.

D. Bike lane at intersection with left turn lane:

- When bike lanes are marked for left turn movements, the bike lane stripe should be to the right of left turning vehicles. (See Figure 7.52.8).

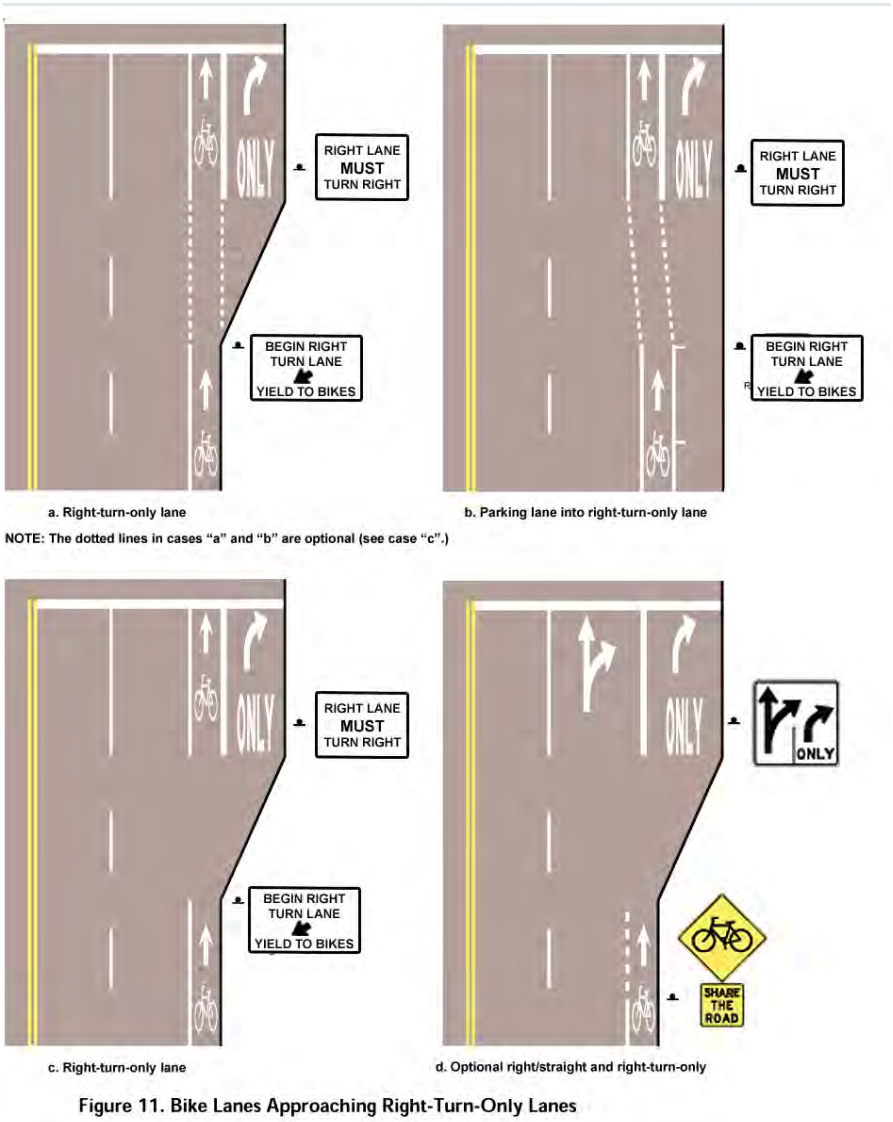


Figure 7.52.3. Bike lanes approaching right turn only lanes.

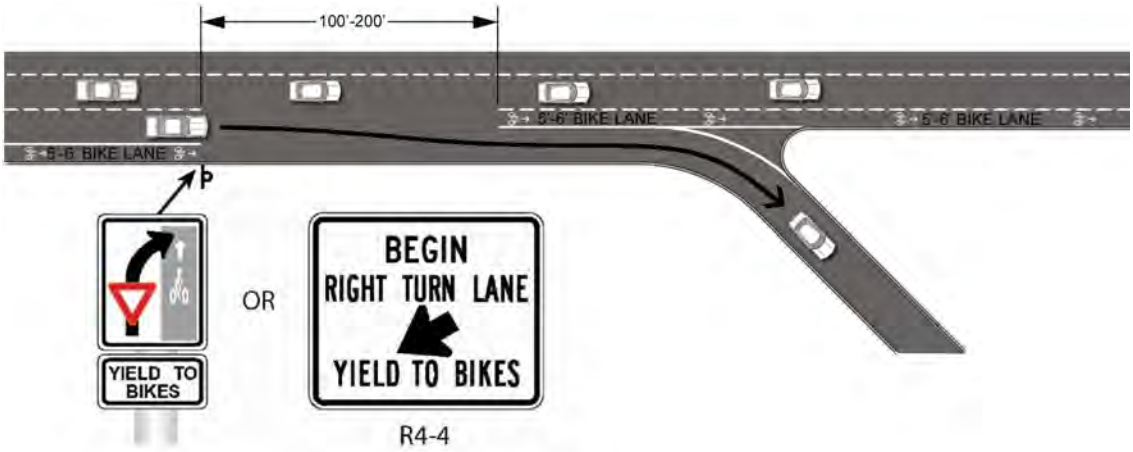


Figure 7.52.4. Typical signing and marking plan for a bicycle lane through a freeway ramp.

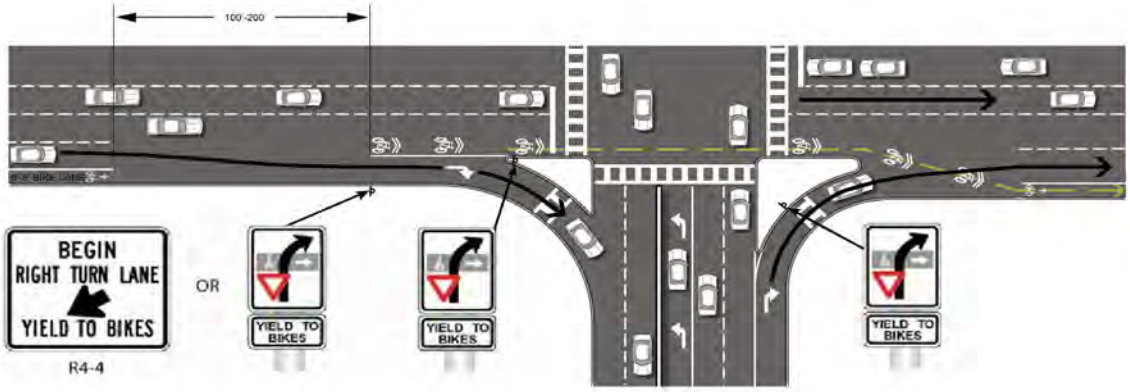


Figure 7.52.5. Typical signing and marking plan for a shared travel lane through a right-turn island intersection with exclusive right-turn movement.

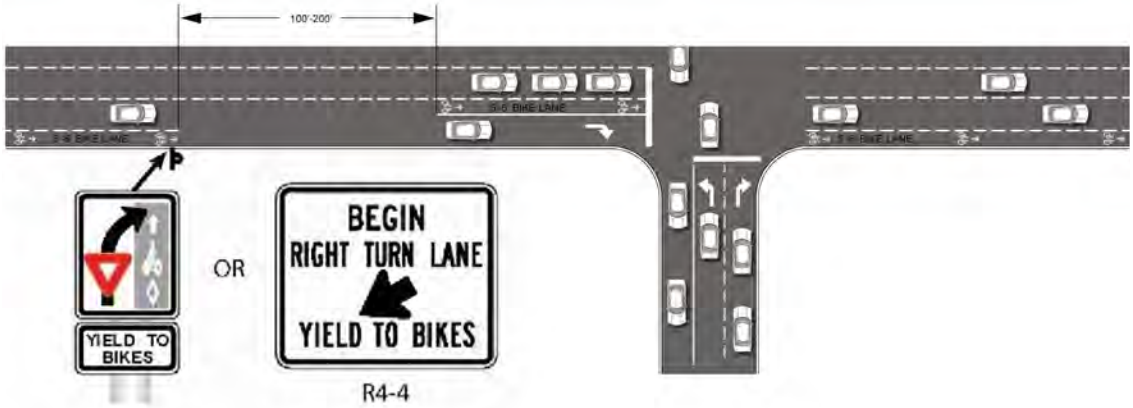


Figure 7.52.6. Typical signing and marking plan for a bicycle lane adjacent to right-turn only lane.

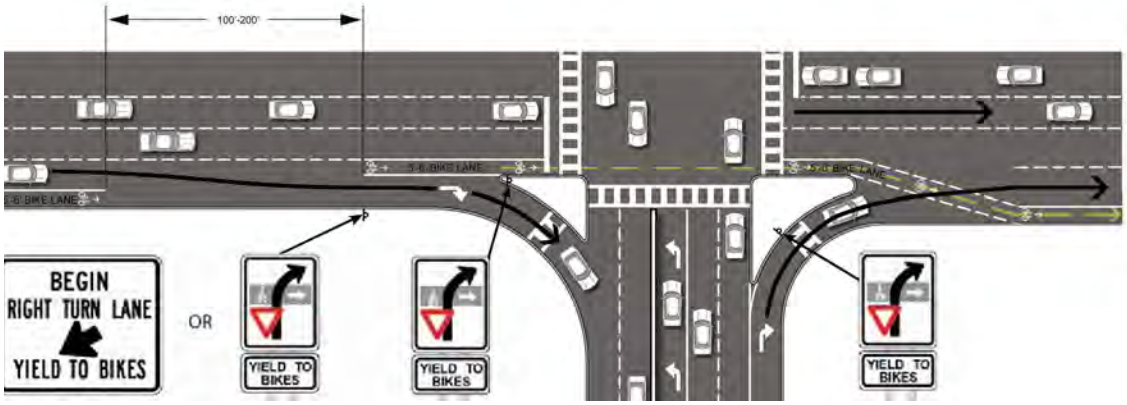


Figure 7.52.7. Typical signing and marking plan for a bicycle lane through a right-turn island intersection with free right-turn lane.

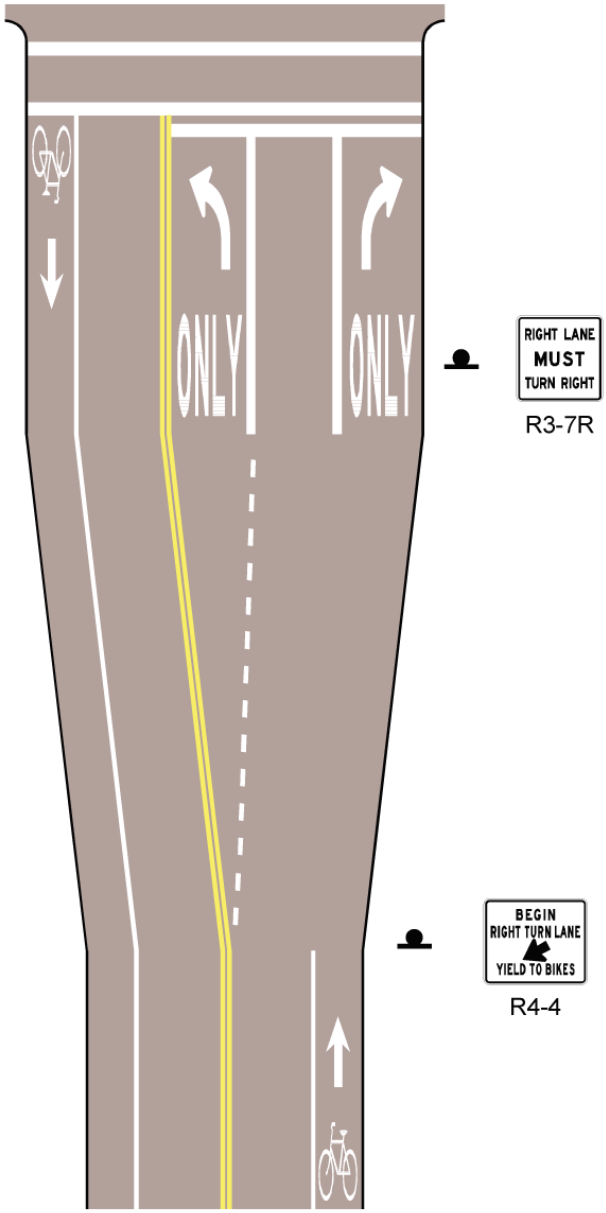


Figure 7.52.9. Typical bike lane approaching an intersection with two directions of travel and throat widening.

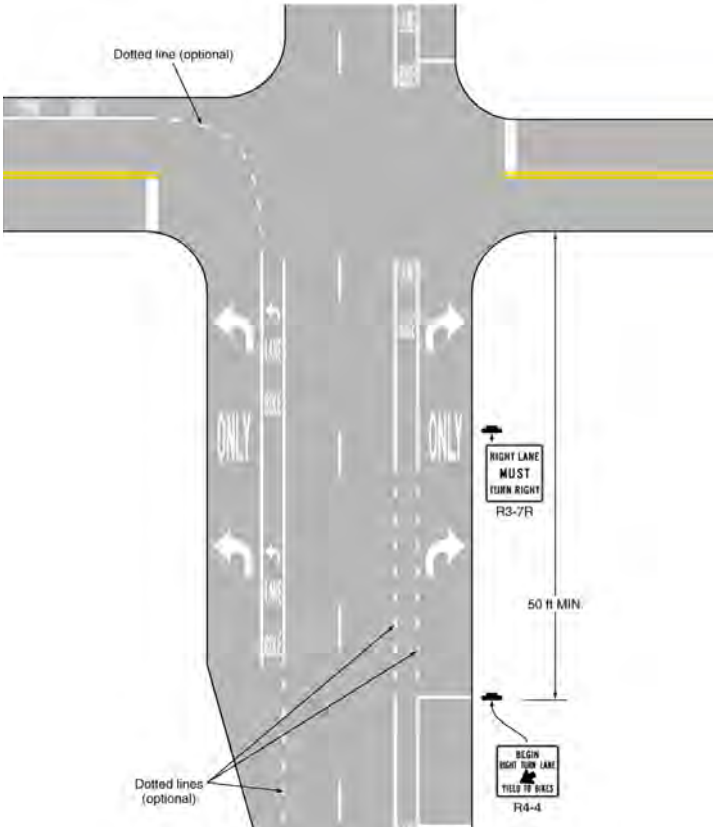


Figure 7.52.8. Examples of intersection signing and pavement markings for one-way travel direction and designated bicycle lane with left, heavy turn volumes.

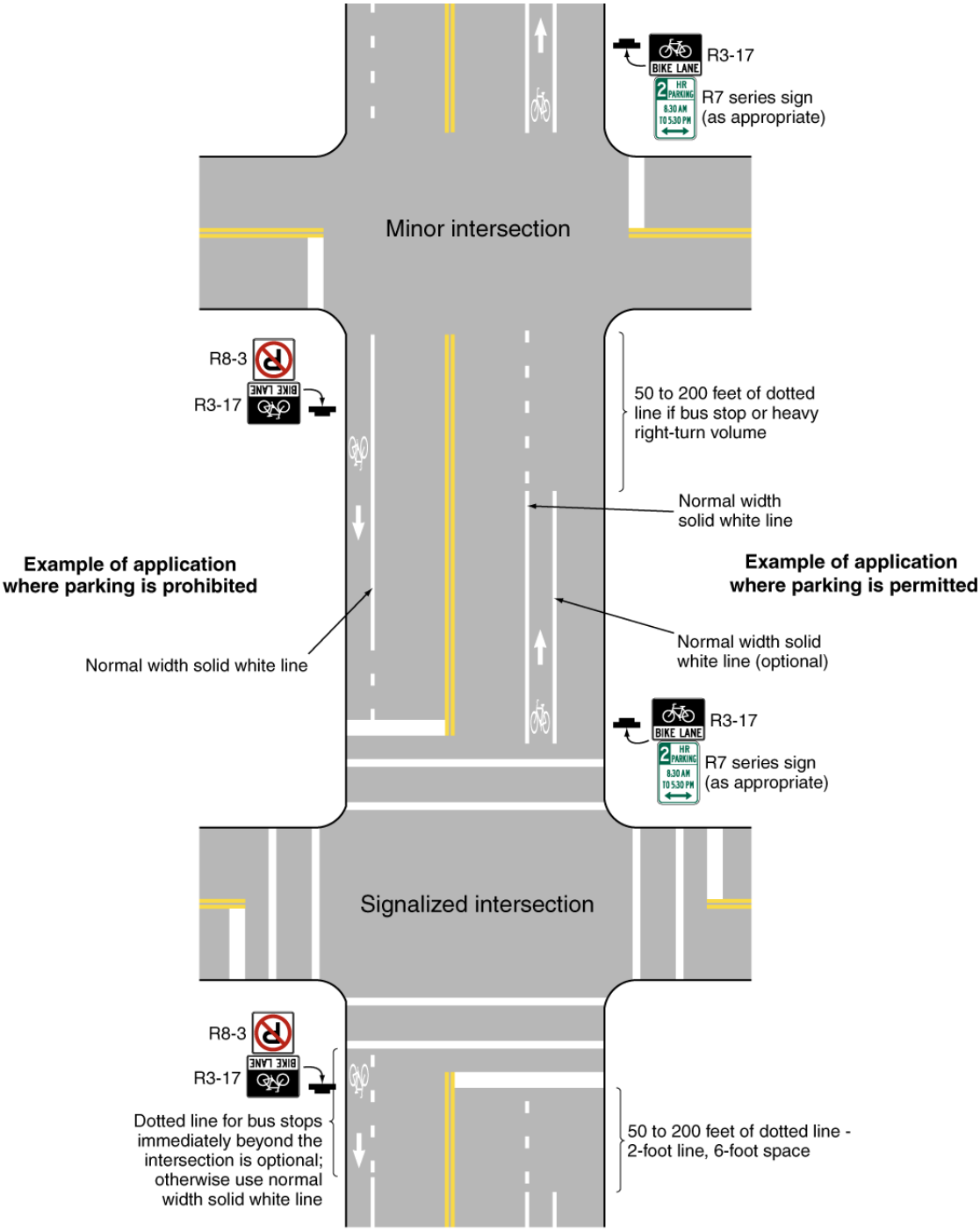


Figure 7.52.10. Example of typical signing and pavement markings for bicycle lanes on a two-way street.

E. Bike lane at modern roundabout: According to the AASHTO Guide for the Development of Bicycle Facilities, a bike lane should be discontinued a minimum of 35 feet to a maximum of 65 feet prior to a traffic circle or roundabout. Bike lane markings are not to be marked on the circular roadway (Figures 7.52.11 and 7.52.12).

Design Criteria:

- Allow bikes to flow with traffic without marked bike lane or allow bike onto pedestrian area for a short distance.
- Provide signing and pavement markings in accordance with MUTCD and AASHTO standards.

Figure 7.52.11. Aerial view of roundabout with multi-use path crossing.

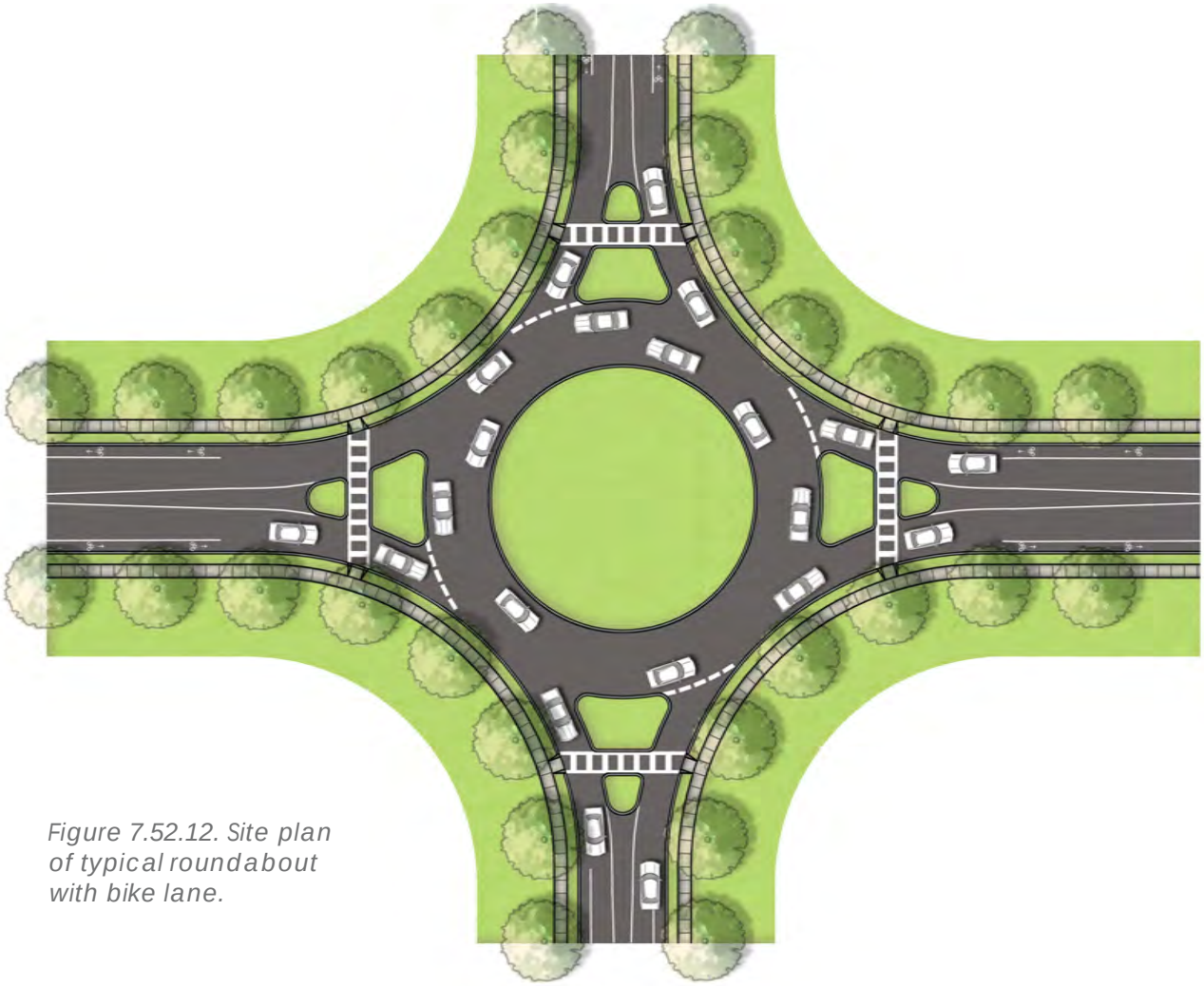


Figure 7.52.12. Site plan of typical roundabout with bike lane.

F. Bike lane at high speed interchange:

Design Criteria:

- Delineate a bike lane through the entire interchange area across the turning roadway intersections (Figure 7.52.13).
- If bicyclists are allowed to merge or maneuver, it would be recommended to discontinue the pavement markings through the crossing area (Figure 7.52.14).
- See page 63 of the AASHTO Guide for the Development of Bicycle Facilities, for additional information regarding pavement marking and signage with bike lanes intersecting high speed interchanges.

Figure 7.52.13. Bicycle crossing at interchange ramp.

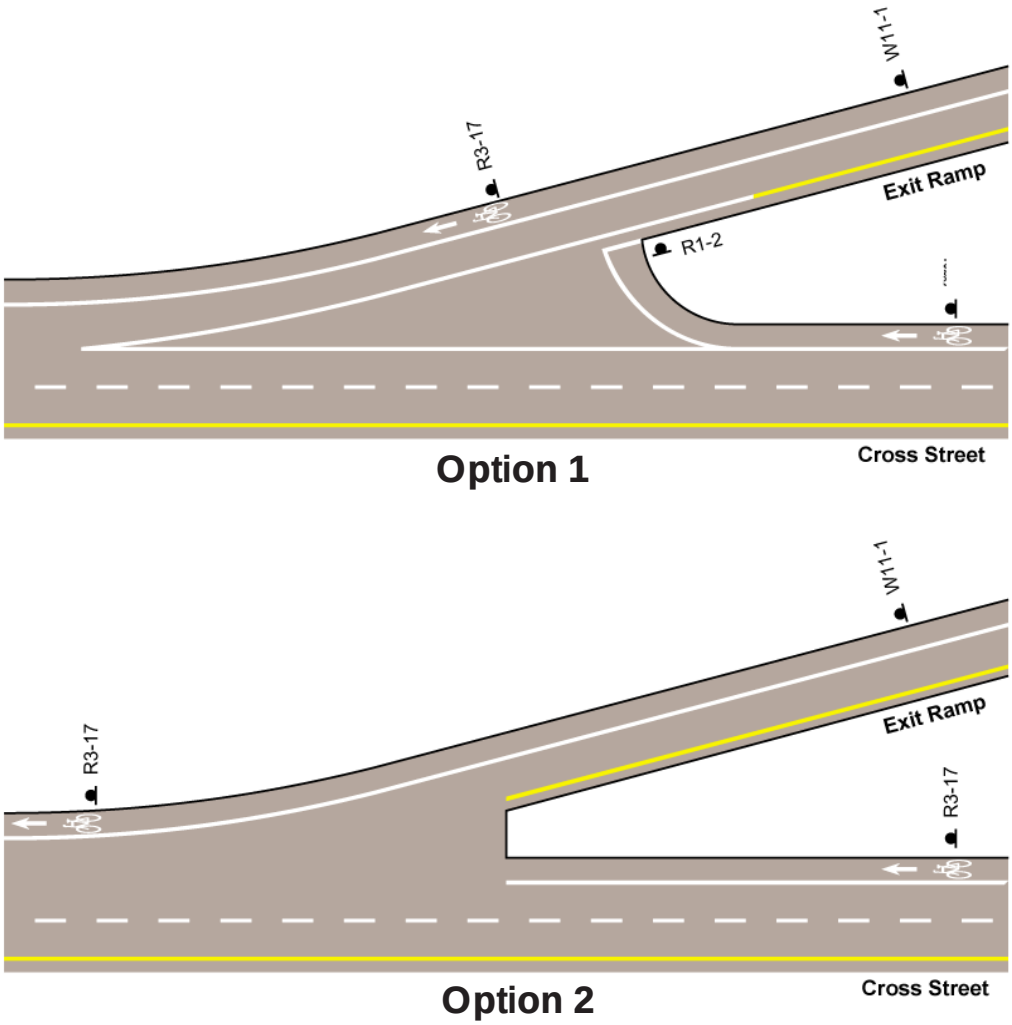


Figure 7.52.14. Bicycle crossing at interchange ramp

G. Bicycle-Activated Detector Loops

Intersections with high traffic volumes and/or high-speed motor vehicles are often very difficult for bicyclists to safely cross. Placing bike activation on these streets gives bicyclists preference on demand without causing undue delay to motorists. On main street intersections, the activation can prolong the green phase and extend the time needed for bicyclists to clear the intersection.

Design Criteria:

- Detector loops should be installed within the roadway to detect bicycles with metal rims.
- Detector loops should be installed at busy signalized intersections to allow safe crossing of bicyclists.
- Provide detector loops that do not require a push button to activate the system.
- Provide pavement markings to instruct cyclists on how to trip detector loops (Figures 7.52.15 through 7.52.18).

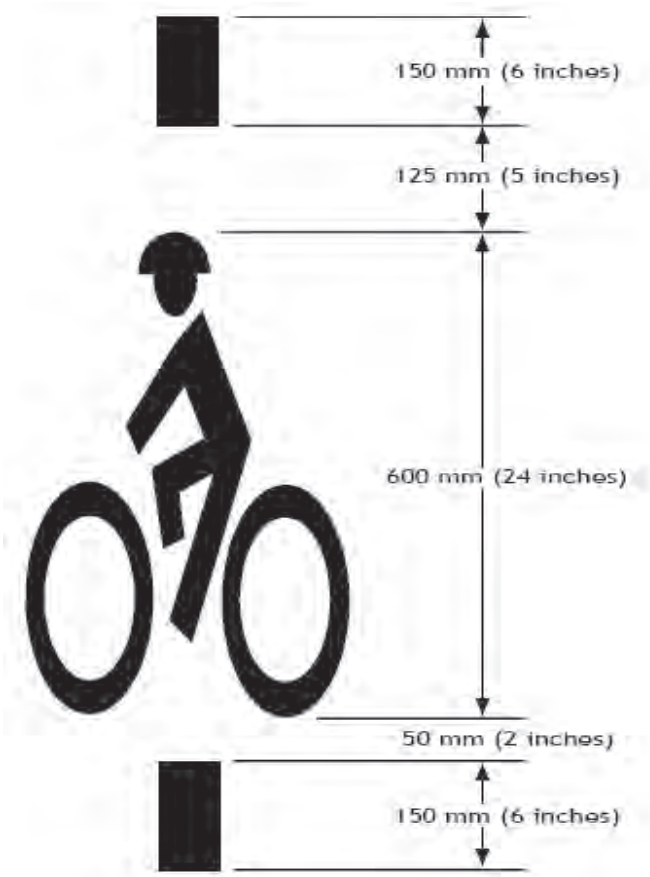
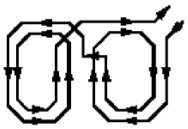


Figure 7.52.17 Pavement marking used to help bicyclists locate loop detectors at intersections.

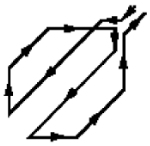
Figure 7.52.15. Pavement marking used to help bicyclists locate loop detectors at intersections.

Figure 7.52.16. Loop detector signage can guide bicyclists on how to use detector loop.

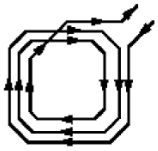
Quadruple Loop
- Detects most strongly in center
- Sharp cut-off sensitivity
- Used in bike lanes



Diagonal Quadruple Loop
- Sensitive over whole area
- Sharp cut-off sensitivity
- Used in shared lanes



Standard Loop
- Detects most strongly over wires
- Gradual cut-off
- Used for advanced detection



From: *Implementing Bicycle Improvements at the Local Level*, FHWA, 1998, p. 70.

Figure 7.52.18. Recommended detector loop patterns sensitive enough to detect bicycles.

H. Bike Box/Advance Stop Line

At busy intersections, bicyclists often have difficulty crossing streets. Installing a bike box/advance stop line allows bicyclists to get to the front of traffic and proceed first when the traffic signal changes to green. The bike box allows bicyclists to be more visible to motorists and eliminates conflicts with right turn movement traffic. Bike boxes have been used effectively in Cambridge, MA; Eugene, OR; Vancouver, BC; and in European countries.

Design Criteria:

- Bike boxes are located at intersections between pedestrian crosswalks and stop lines.
- Bike boxes are located at a right angle extension to a bike lane at the head of an intersection and allow increased motorist and bicyclist visibility.
- The "box" should have a contrasting pavement color and/or be clearly marked. Preferred color is blue or green (Figure 7.52.19).
- Bike boxes can range from 6 feet to 12 feet in depth. The preferred depth is 12 feet.
- Design the bike box wide enough to encompass the entire outer lane and the adjacent bike lane if present.
- Right vehicle turns on red are prohibited (except bikes).
- Do not allow the bike box to encroach or extend into the crosswalk.
- Provide signage and pavement marking per Figure 7.52.20.
- Bike boxes are effective for use in high volumes of traffic and with high turning movements.
- Bike boxes are not currently included in MUTCD standards.
- Bike boxes can be combined with bicycle signal.
- Bike boxes at intersections with high volumes of right turns may not be compatible.

Figure 7.52.19 . Example of bike boxes filled in color to designate space for bicyclists. Painting or colored additives applied to the pavement are preferred over thermoplastic striping to reduce slick surface.

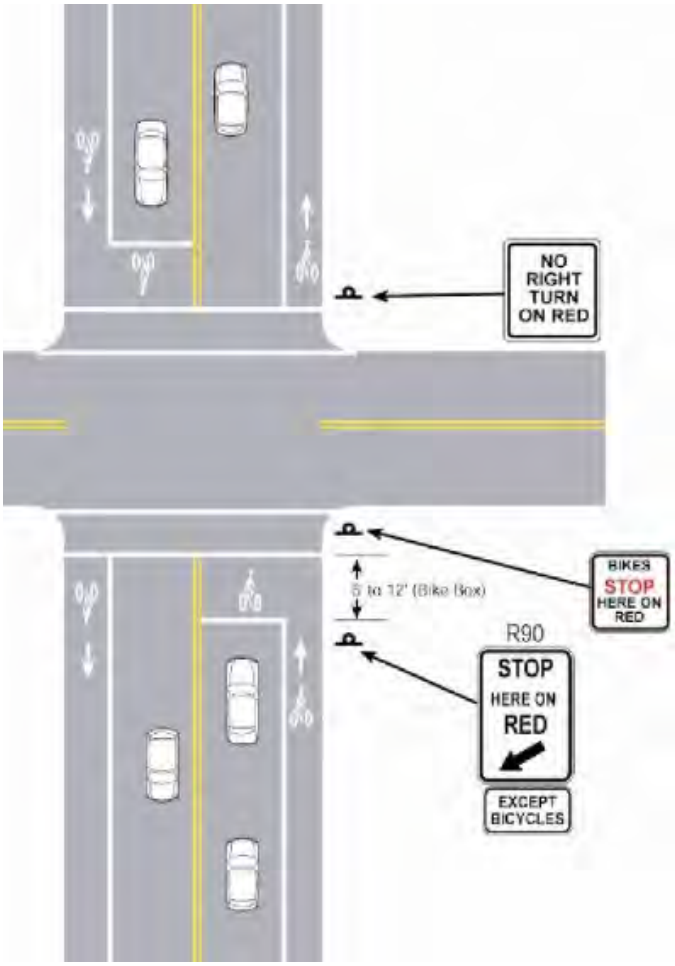


Figure 7.52.20. Plan view of bicycle box configuration

I. Advanced Stop Bars

Typically installed at busy intersections, advance stop bars allow for safe movement of bicyclists through an intersection. They are normally located several feet ahead of the motor vehicle stop bar to allow visibility by motorists. The advance stop bar also allows bicyclists to cross the street at a faster pace when the traffic signal changes to green (Figure 7.52.21).

Figure 7.52.21. Example of advanced stop bars.

Design Criteria:

- The advanced stop bar should be placed 4 feet in advance of any marked crosswalks.
- The stop bar should be painted white and is 24 inches wide.
- The stop bar should be located at signalized intersections and at multi-way stops.
- See Arlington Design Manual Criteria and MUTCD for additional information regarding Advance Stop Bar requirement.

J. Bicycle Facilities at Railroad Crossings

Railroad crossings are often hazardous to wheeled devises such as bicyclists and wheelchairs. Railroad crossings have flangeway gaps that allow passage of the train, but also have the potential to catch bicycle and wheelchair tires. In addition to the fixed rails and ties, other loose material can often create tripping hazards.

Where possible, bicycle crossings at railroads should be minimized and the crossing location should have a direct and clear view of oncoming trains and bicyclists. Warning signs and pavement markings must be installed in accordance with MUTCD standards.

Design Criteria:

- Filler should be made of compressible material to enhance bike operation and prevent pedestrian hazards (Figure 7.52.22).
- At the crossing of the train tracks, install a rubber surface that will not buckle, expand, or contract around railroad flangeways to reduce changes in grade and maintenance problems (Figure 7.52.23).

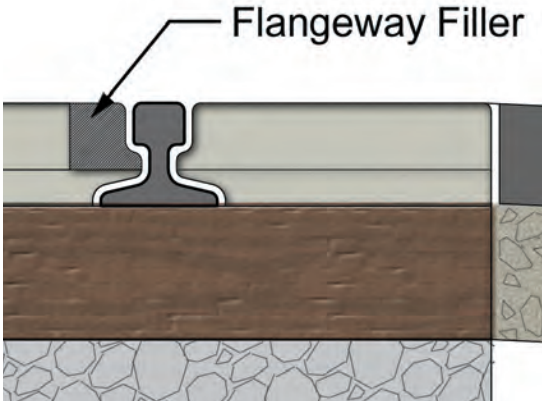


Figure 7.52.22. The flangeway filler eliminates the gap between the rail and pavement surface. It helps to provide a safe path of travel for pedestrians and bicyclists crossing the railroad tracks. The filler consists of a rubber insert that deflects downward with the weight of a train and does not affect railway function.

- The most desirable crossing is perpendicular (or as close to 90 degrees as possible) to the rails to minimize the potential for a bicyclist's front wheel becoming trapped in the flangeway (Figures 7.53.24).
- Pedestrian railroad crossings should have a clear view of an on-coming train several hundred feet away to give advance warning to users (Figure 7.53.25).
- If the crossing angle is less than 45 degrees, additional paved area on the outside lane, shoulder, or bike lane shall be provided to improve the angle of approach and allow bicyclist to cross as close to 90 degrees as possible (Figures 7.52.26 through 7.52.28).
- The rail elevation and bike path approach should be the same. Raise or lower the approach to the track to be level with the top of the rail and create a flat surface area to cross railroad tracks (Figure 7.52.29).
- Warning signage and pavement markings should be installed in accordance with MUTCD standards, providing railroad crossing information in multiple formats, including signs, flashing lights, and audible sounds. The MUTCD requires railroad crossing signs whenever railroad tracks intersect the street.
- The material and pavement should be free from gravel or any loose material that could potentially become a hazard or cause accidental tripping or crashing.
- Detectable warnings should be installed, similar to a transit platform, when crossing the railroad.
- Regular maintenance shall be conducted to ensure that a clear view of trains is achieved and the pavement is free from cracks and debris.
- Channelization of pedestrians at designated crossings should be considered.

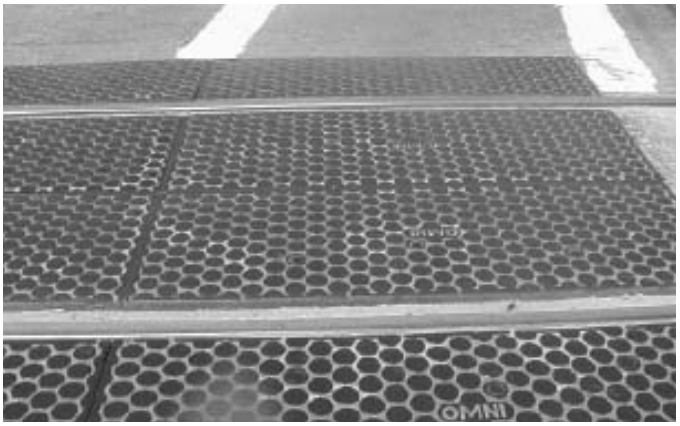


Figure 7.52.23. Example of a rubber surface around the railroad flangeways helps provide a safe level crossing surface and prevents other maintenance problems.

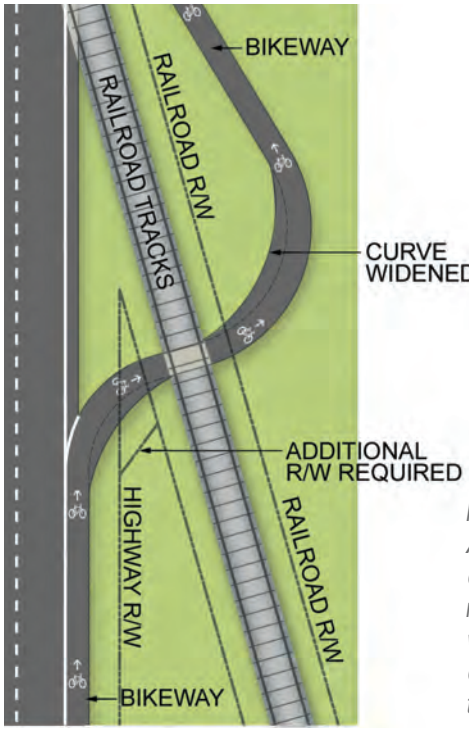


Figure 7.52.24. A 90 degree crossing is the most desirable when bikeways cross railroad tracks.

Figure 7.52.25. Provide clear visibility at railroad crossing.

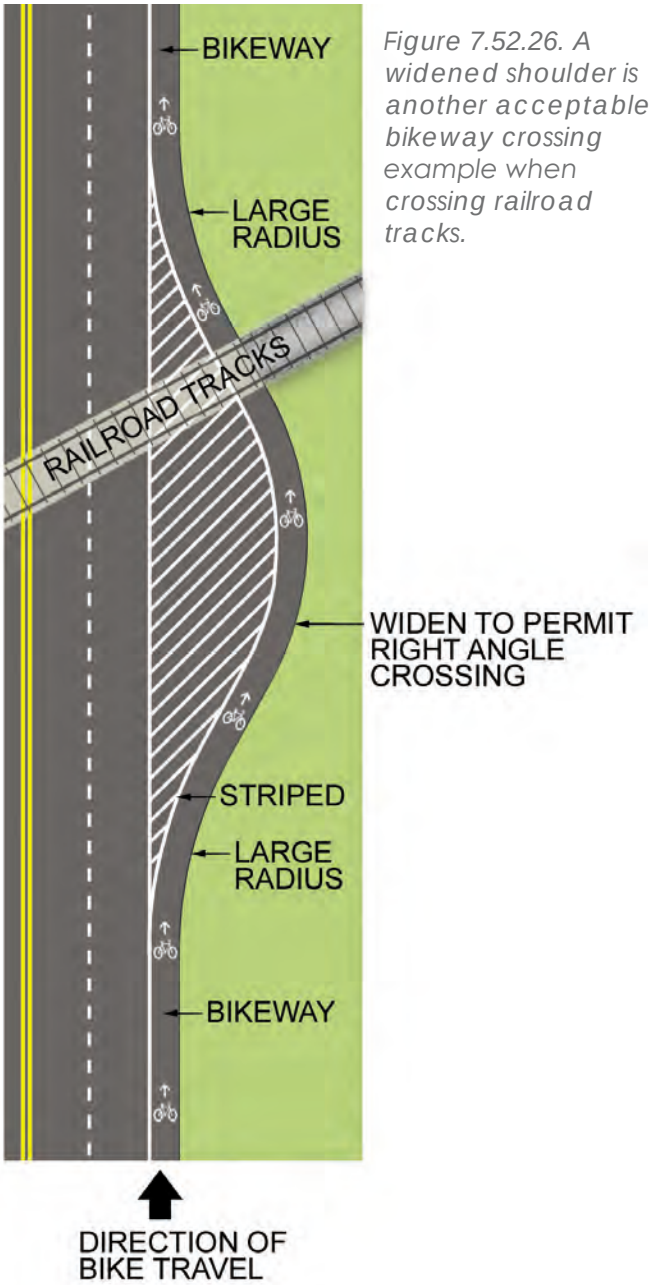


Figure 7.52.26. A widened shoulder is another acceptable bikeway crossing example when crossing railroad tracks.

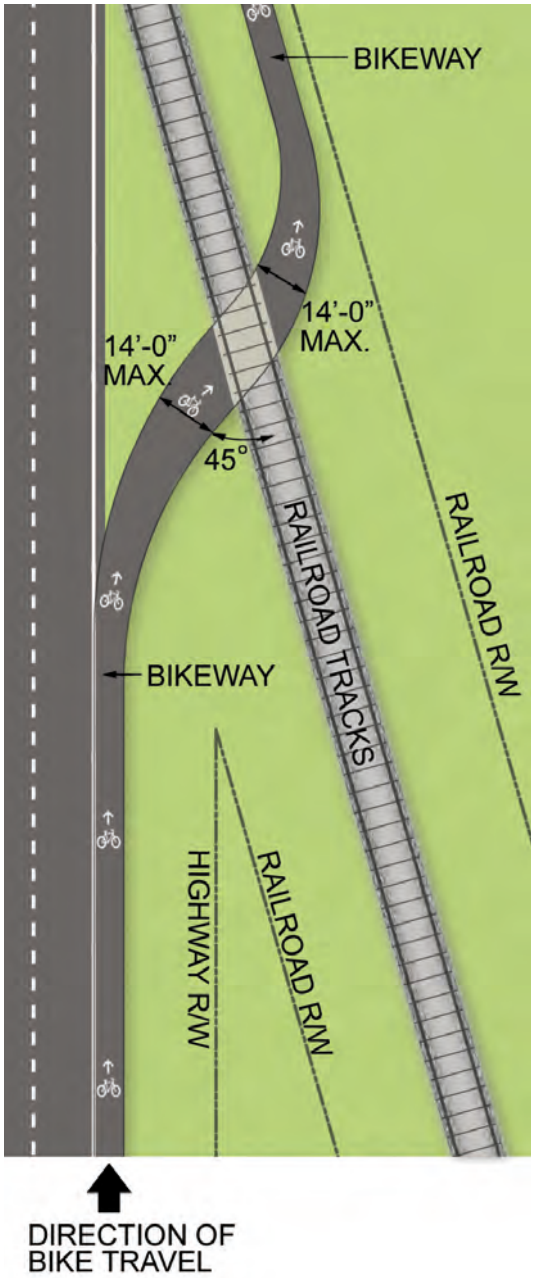


Figure 7.52.27. A 45 degree bikeway crossing is acceptable when crossing railroad tracks.

Figure 7.52.28 . Avoid crossing railroad tracks at less than 45 degree angle.

Figure 7.52.29. Raise the path approach to the track level to create a flat surface to cross the rail road track.

K. Bicycle Refuge Islands

Refuge islands should be used when high volumes of roadway traffic and/or speeds create unacceptable conditions for path users or when roadway widths are excessive, given the available crossing time. Refuge islands are used by a number of people who cross a intersection more slowly such as elderly, school children, and people with disabilities.

Refuge areas should be large enough to accommodate large groups of pedestrians and bicyclists. Adequate space should be provided so that bicyclists do not feel threatened by passing motorists while waiting to finish the intersection crossing. (Figure 7.52.30) Refer to pedestrian facilities section for more information regarding median refuge islands.

Design Criteria:

- Minimum width of median refuge island for bicyclists is 8 feet.
- Provide pavement striping and signage in accordance to City of Arlington Design Criteria Manual, AASHTO, and MUTCD design standards.
- Refer to 8.13 Appendix, City of Arlington's Design Criteria Manual for design specification for creating refuge areas.
- Provide low-level landscape material in medians to maintain motorists and bicyclists sight visibility.
- Provide adequate roadway lighting.

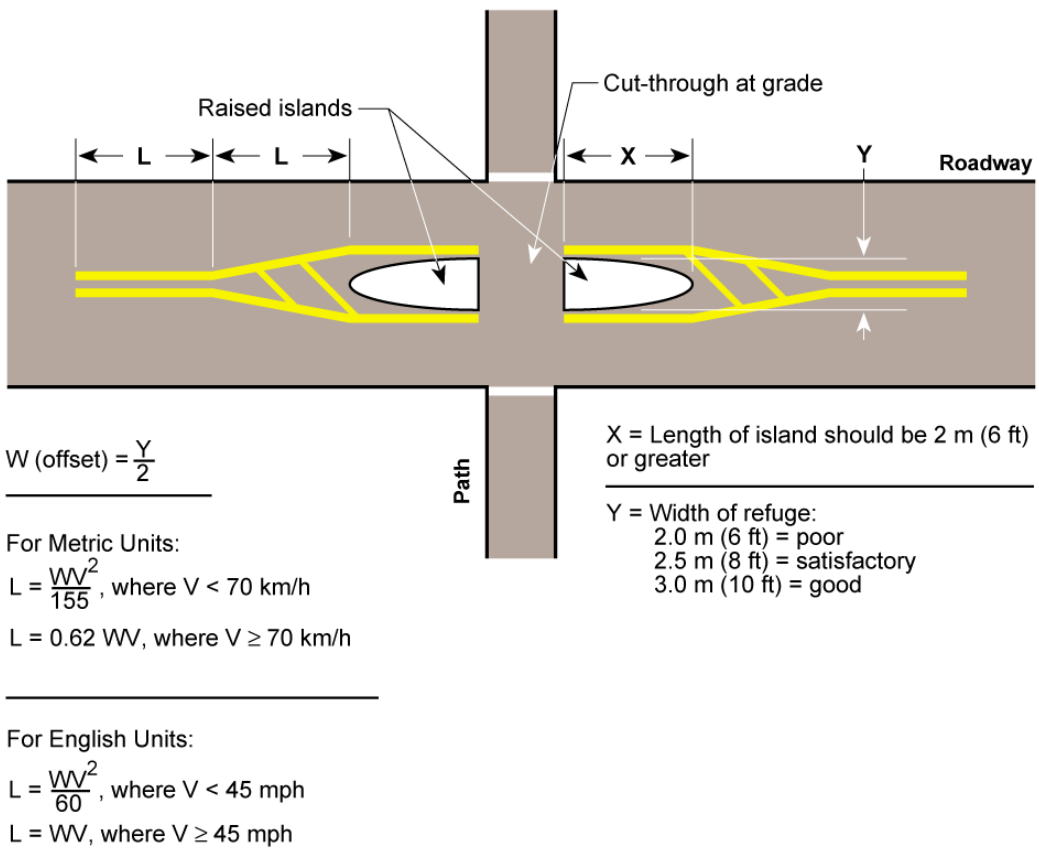


Figure 7.52.30. Typical detail for refuge island and pavement markings.

L. Underpass

An underpass is a passage way for a pedestrian or bicyclist that is typically below a bridge, roadway, or railroad. Underpasses can provide a safe connection between two land uses that are separated by a physical barrier. Roadways can provide a physical barrier due to high traffic volumes. Topographic conditions, safety, and other physical barriers can also warrant the construction of underpasses to help ensure pedestrian access and connections to occur.

As with underpasses or bridges, ADA–compliant ramps and/or stairs are used to effect the elevation change. It is found that pedestrians and bicyclists use grade separated crossings more often if the elevation change can be minimized or worked into the normal path of pedestrian and bicyclist movements. Underpasses can be more expensive than other bicycle and pedestrian solutions to install, but because they can be designed with less grade changes than overpasses, they are often preferable (Figure 7.52.31).

Design Criteria:

- The minimum vertical clearance of an underpass is 10 feet. Special consideration shall be provided to maintain adequate clearance and a maximum grade of 5 percent for the approaching parkway. (Figure 7.52.32).
- The minimum width is 12 feet.
- The underpass shall be wide enough to accommodate emergency vehicles.
- The underpass shall include adequate lighting for safety.
- The slope of ramps must be comply with ADA Guidelines and be accessible by all ages and abilities.
- When underpasses are used, approach grades shall slope away from the underpass to prevent flooding and provide positive drainage away from the underpass. Additional drainage measures may be required.
- Adequate sight distance should be provided in underpasses, preferably with open ends of the tunnel in clear view at all times.
- When designing an underpass, the aesthetic appearance of the facility shall be considered so that the structure fits within the surrounding context.
- Underpass materials can be either concrete or galvanized metal sheeting. Concrete is the preferred material.
- Pedestrian and bicycle access to roadway surfaces above underpass should be provided.
- When designing a tunnel, provide soil exploration to determine if a tunnel is feasible to construct.
- Tunnels should be designed to let more natural light in and provide a wide opening to be more inviting to pedestrians.

Figure 7.52.31. A tunnel for multi-use trail underpass.

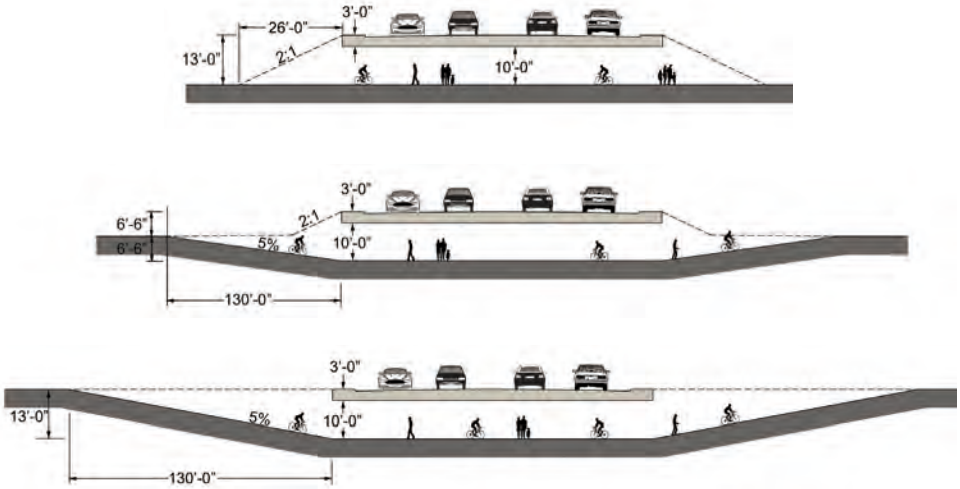


Figure 7.52.32. Typical underpass/undercrossing configurations.

M. Overpass

Overpasses are an important part of pedestrian and bikeway design and may be necessary to provide continuity for shared and multi-use paths. Barriers to bicycling often include freeways, complex interchanges, existing busy roads, waterways, or railroads. Overpasses and bridges should be easily accessible and convenient for pedestrian and bicycle access. Consideration should be given to cost, constructability, maintenance, aesthetics, safety, and physical constraints when designing or providing an overpass. The type of structure typically depends on the span length.

Design Criteria:

- The overpass must meet bridge structural design standards and shall be designed to accommodate pedestrian, bicyclist, maintenance, and emergency vehicle loading.
- Bridges built over roadways, railroads, and waterways must maintain a minimum clearance under the structure. When designing a bridge structure, consult local, state, and federal design requirements for required clearance heights.
- Bridges built over waterways must not negatively impact the 100 year flood elevations. Consult engineering guidelines for clearance requirements when crossing over 100 year flood zone.
- Enclose overpasses with fencing and/or with safety railings to protect users.
- Railing fences or barriers on both sides of the path on a structure shall be a minimum of 42 inches high.
- On new bridge or overpass structures, the minimum clear width should be the same as the approach paved surface, plus a minimum of 2-foot-wide clear areas on each side. The clear areas provide the opportunity to avoid conflicts among bicyclists and railings, handrails, and other bicyclists who may have stopped on the bridge.
- The slope approach should grade away from the overpass to provide positive drainage away from the structure. The maximum slope approaching the overpass shall be 5 percent (Figure 7.52.34).
- Geotechnical evaluations of existing soil conditions and recommendations for bridge abutments are required.
- When designing an overpass, the aesthetic appearance of the facility shall be considered so that it fits within the surrounding context.

Figure 7.52.33. Examples of multi-use trail overpasses.

- Overpass materials can be constructed of concrete, steel, wood, or a combination of these materials.
- Overpasses can often be designed as a community landmark or gateway element.
- Grade separated crossings are more commonly used and look more aesthetically pleasing if elevation changes can be minimized or worked into the normal path of pedestrian movements.
- Screens are often used as a necessary buffer between vehicle traffic and the bicycle overcrossing.
- On all bridge decks, special care should be taken to ensure that bicycle–safe expansion joints are used and that decking materials that become slippery when wet are avoided.
- Lighting should be considered in urban conditions and should be provided, where street lighting is not provided.

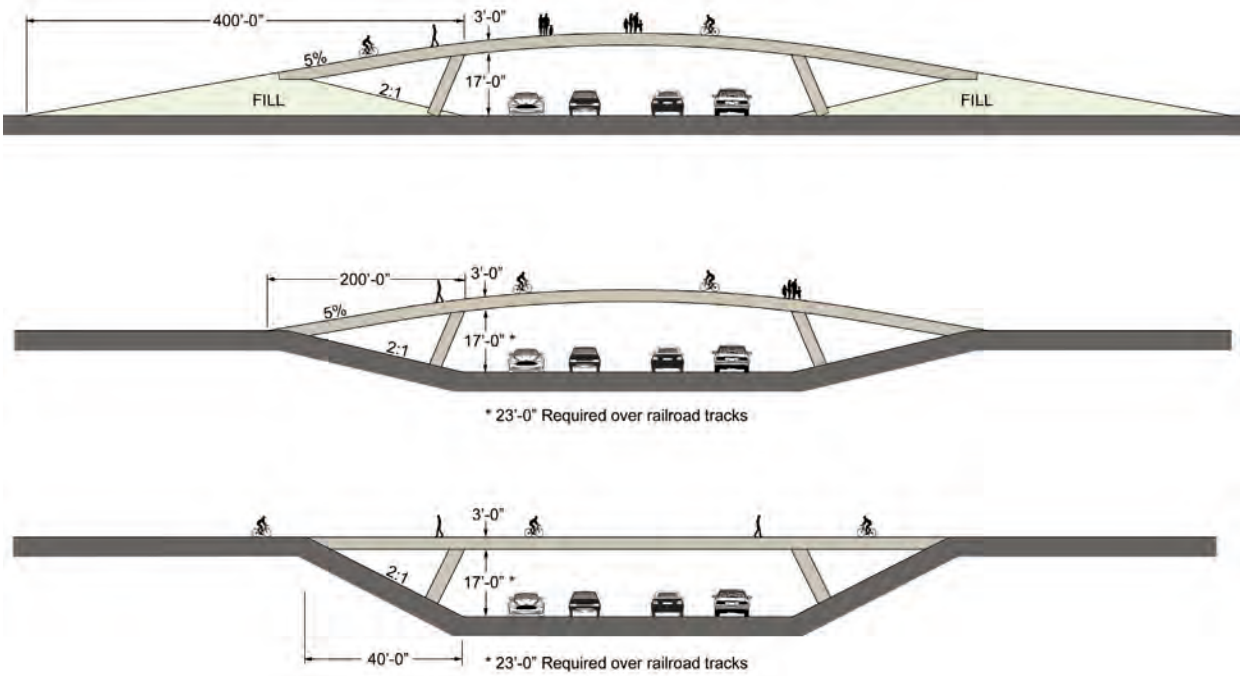


Figure 7.52.34. Typical overpass/overcrossing configurations.

7.6 MULTI-USE FACILITIES

There are three types of multi-use trails; sidepaths, paved trails and unpaved trails. A sidepath is a multi-use facility that runs adjacent to a roadway. A trail is typically located within a linear greenway corridor which may be natural (rivers, streams) or manmade (abandoned rail line or utility corridors). Multi-use sidepaths and trails are designed to accommodate a variety of users including bicyclists, walkers, hikers, joggers, skaters, horseback riders, and those confined to wheelchairs.

Multi-use sidepaths and trails are are an important recreational amenity for communities. They provide connections to neighborhoods, schools, parks, and other community landmarks. Sidepaths and paved multi-use trails are generally located in or near urbanized areas. Unpaved multi–use trails are generally located in rural areas and also provide access to environmentally sensitive areas.

This section also includes design guidelines related to trail heads which are typically located at the terminus of a trail corridor and at a place where large concentrations of trail users are expected, such as major parks, schools, commercial areas and/or neighborhoods. Also refer to the City of Arlington Design Criteria Manual, Chapter 4, Section 4.7, Protection and Restoration of Linear Park Land when designing multi-use trails.

Figure 7.61.1. Example of a multi-use, multi-directional sidepath.

7.6.1 Multi-Use Sidepaths

Where space is limited to accommodate a separate bike lane and a sidewalk, a multi-use sidepath may be the best alternative to facilitate the safe movement of all users. To prevent conflicts with motorists, a multi-use sidepath is best located where corridors have fewer driveways and intersections, and is located within the right-of-way. It is also advantageous if the multi-use sidepath is part of a bicycle route system with other bicycle facilities, such as paved shoulders and/or marked bike lanes (Figures 7.61.1 and 7.61.2).

Design Criteria:

- A two directional sidepath should have a minimum width of 10 feet with at least 2 feet graded shoulder area at both sides of path.
- In high use areas, provide a minimum 12-foot sidepath.
- A sidepath should have a minimum vertical clearance of 7 feet.
- A planted buffer of 3 to 5 feet (5 feet preferably) between edge of path and back of curb or edge of street shall be provided.
- The sidepath should be paved asphaltic concrete or a concrete.
- Provide removal bollards at intersection or roads and multi-use side paths. Multi-use side paths often need some form of physical barrier at intersections to prevent unauthorized motor vehicles from using the facilities. Provisions can be made for a lockable, removable (or reclining) barrier post to permit entrance by authorized vehicles.
- When crossing a road, side paths shall cross at 90 degree angle (Figure 7.61.3).
- At intersections, side paths shall provide connections to existing sidewalks (Figure 7.61.4).
- When side paths cross an intersecting road, vehicular motorists are required to stop before the side path intersection (Figure 7.61.6).
- Post or bollards should be setback beyond the clear zone on the crossing roadway or be a breakaway design. The post should be permanently reflectorized for nighttime

visibility and painted a bright color for improved daytime visibility. When more than one post is provided, a minimum of 5-foot spacing is desirable between posts (Figures 7.61.5 and 7.61.6).

- Provide signing and marking for multi-use paths in accordance with AASHTO and MUTCD design standards.
- Well designed transitions from sidepaths to on-road facilities will direct bicyclists to the correct side of the roadway.
- Coordination with utility provider will be necessary if multi-use sidepath is located within the utility corridor.

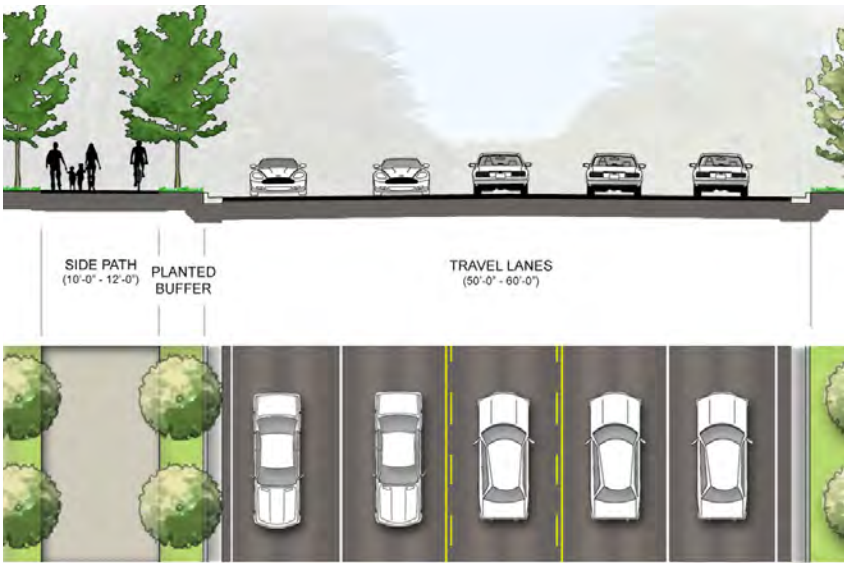


Figure 7.61.2. Four travel lanes with center turn lane typical plan and section with multi-use side path.

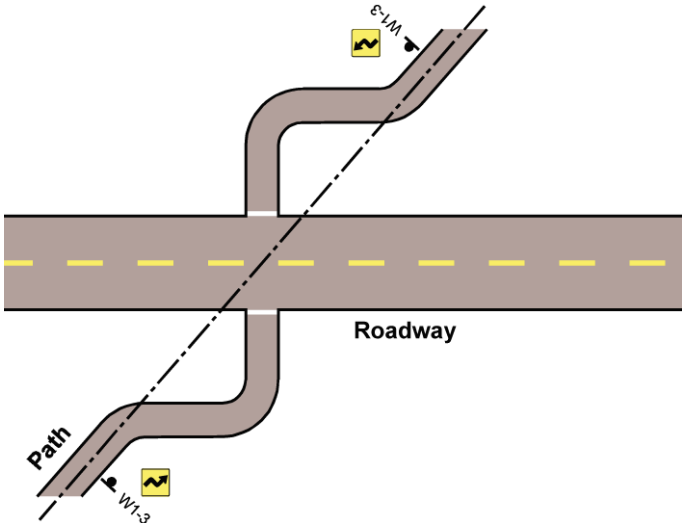


Figure 7.61.3. Typical redesign of a side path crossing road at 90 degree angle to provide better visibility at intersection.

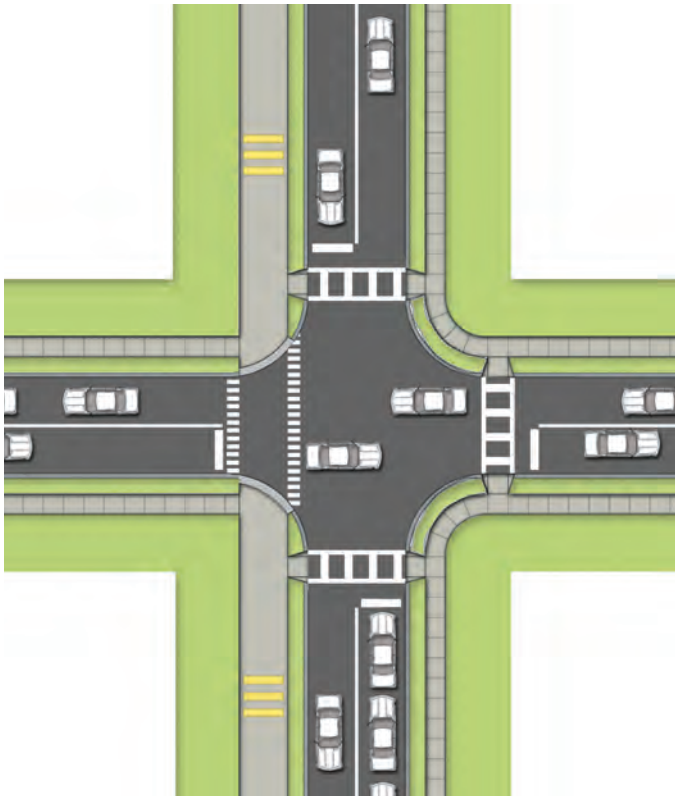


Figure 7.61.4. Typical detail of four-way intersection crossing with side path and sidewalks.

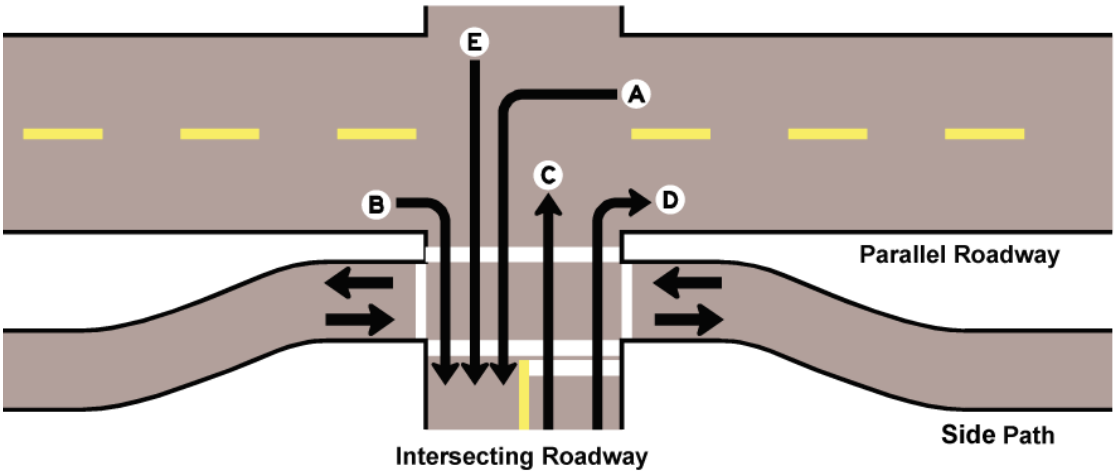
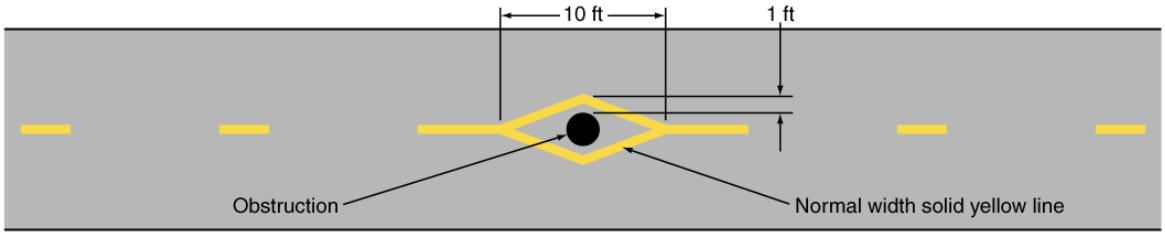


Figure 7.61.5. Typical Example of sidepath at roadway intersection. Vehicular motorists are required to stop before sidepath intersection. A-E indicates traffic direction through intersection.

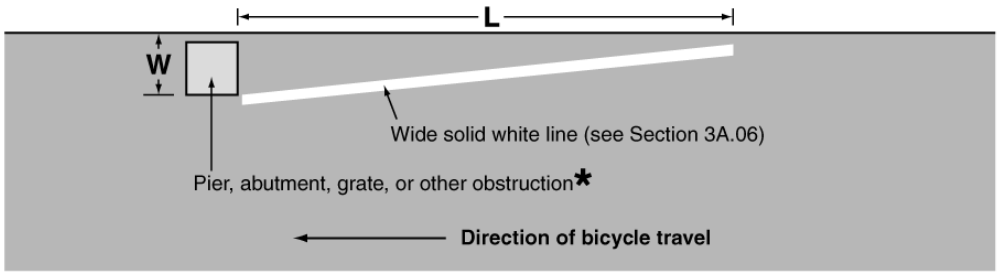
Figure 7.61.6. Example of bollard spacing.

Figure 7.61.7. A multi-use side path at controlled intersection.

Figure 7.52.8. Obstruction and required pavement markings.



A - Obstruction within the path



B - Obstruction at edge of path or roadway

L = WS, where W is the offset in feet and S is bicycle approach speed in mph

* Provide an additional foot of offset for a raised obstruction and use the formula L = (W+1) S for the taper length

7.6.2 Paved Multi-Use Trails

For corridors with heavy bicyclist and pedestrian use, paved multi-use trails are desirable over unpaved since they minimize accidental tripping and provide better traction for all users. If these trails are connected to an urban environment, street, or other major landmarks, it is preferred that they are paved to provide better long term use and limit future maintenance concerns.

Design Criteria:

- The minimum width for a one-way paved facility is 6 feet. The clearing and grubbing area is approximately 12 feet wide and the selective thinning area is approximately 20 feet (Figure 7.62.1).
- The minimum width for a two-way paved facility is 10 feet. The clearing and grubbing area is approximately 18 feet and the selective thinning area is 30 feet (Figure 7.62.2).
- Selective thinning is meant to provide visibility along the trail or pathway corridor. Mature trees that do not create a site distance hazard should be maintained. Additional selective clearing may be required to provide adequate sight lines and safety for the trail users.
- On trails with heavy pedestrian and bicyclist use, a 12-14 foot wide multi-use trail facility is required. The clearing and grubbing area should be an additional 4 feet each side of the pathway plus additional 5 feet each side of the path for selective thinning area (Figure 7.62.3).
- Multi-use trails must conform to ADA and MUTCD standards.
- The recommended surface for paved facilities shall be concrete or asphalt and should be designed to withstand the loading requirements of emergency and maintenance vehicles. Refer to the City of Arlington Design Criteria Manual for pavement standards (Figure 7.62.4).
- Location maps, directional, mileage, and navigation, and regulatory signage ("rules

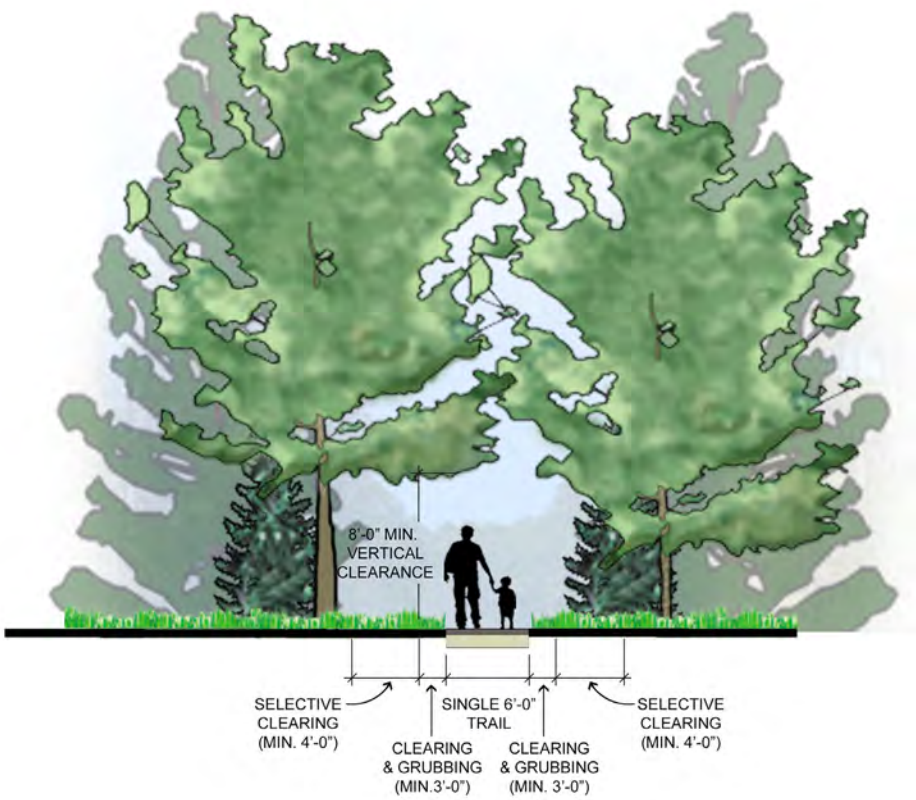


Figure 7.62.1. Typical one-way, paved 6-foot wide trail.

of the trail") shall be posted.

- In flood prone areas, multi-purpose trails should be constructed of concrete.
- When constructing multi-use trails on steep slopes, walls may be required. Wall materials shall withstand periodic flooding. (Figure 7.62.5).
- Centerline stripes should be provided for paths that generate substantial amounts of traffic.
- Side slopes shall be a maximum of 1:6 adjacent to both sides of the trail. When the bottom of the slope is unsafe, a dense shrubbery, chain link fence, or other physical barrier may be required.
- The minimum vertical clearance is 10 feet. Greater clearance for maintenance and emergency vehicles may be required.
- Trails need to be well drained with a 2 percent cross slope.
- Environmental and wetland impacts should be minimized.
- Cautionary signs should be provided for steep slopes, blind curves, and other potential hazards.
- When the separation between the edge of the road and trail is less than 5 feet, a suitable barrier should be provided. The barrier shall be a minimum of 42 inches in height. When barriers are used, they shall not impair sight distance at intersection or along a roadway.
- Potential conflicts between user groups must be considered and addressed during the development phase of the trail.
- Refer to AASHTO design standards for design speed, horizontal alignment, grade, sight distance requirements and other related design requirements.
- Slopes greater than 5 percent are considered undesirable. When slopes exceed 5 percent on a heavy use multi-purpose trail, increase the width to 14 feet. Provide signage that alerts bicyclist of maximum percent grade.
- Refer to local, state, and federal stream

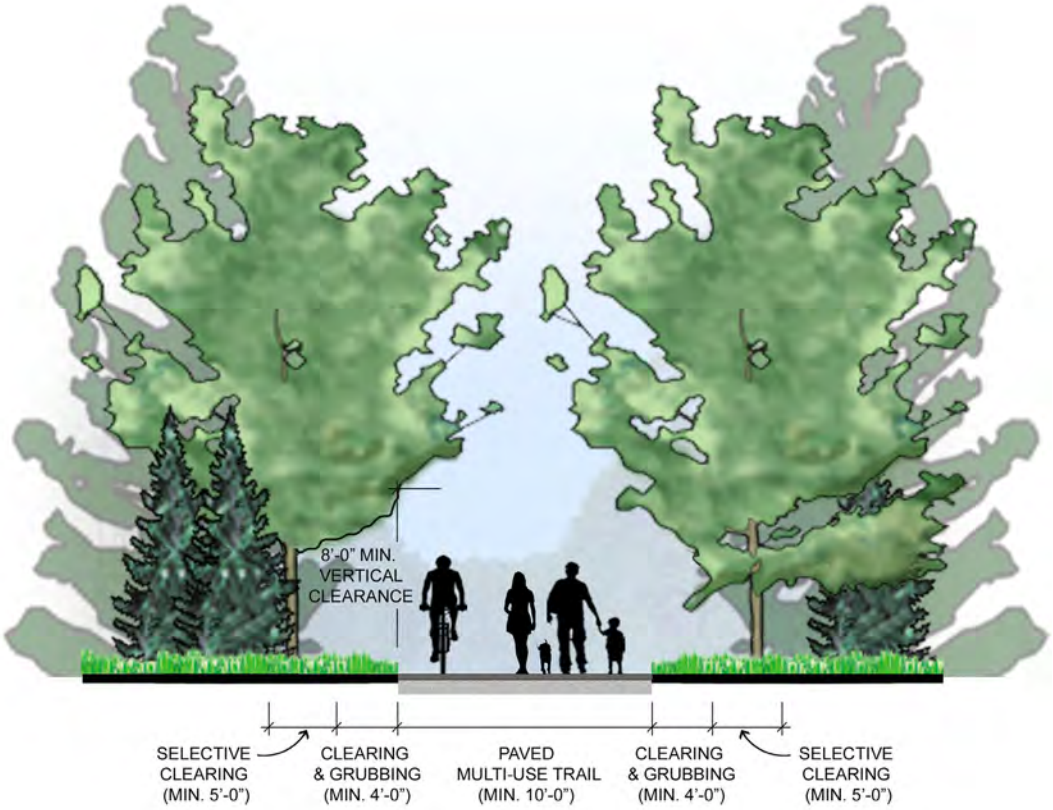


Figure 7.62.2. Typical two-way, paved 10-foot wide multi-use trail.

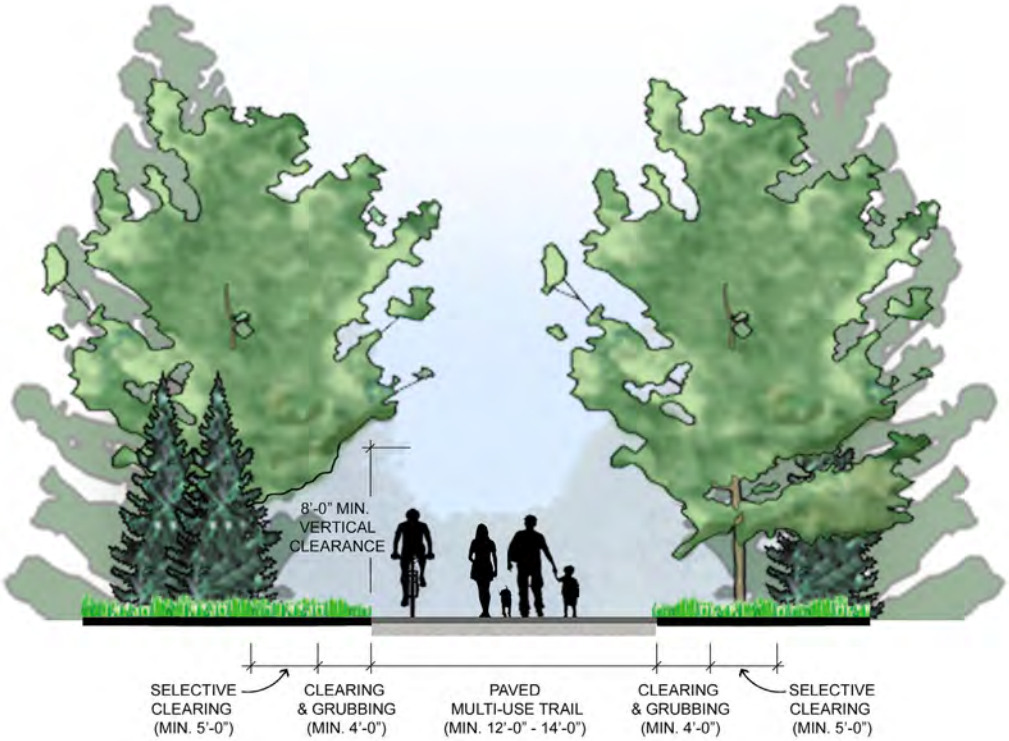


Figure 7.62.3. Typical section for heavy traffic areas for two-way paved 12 to 14-foot wide multi-use trail.

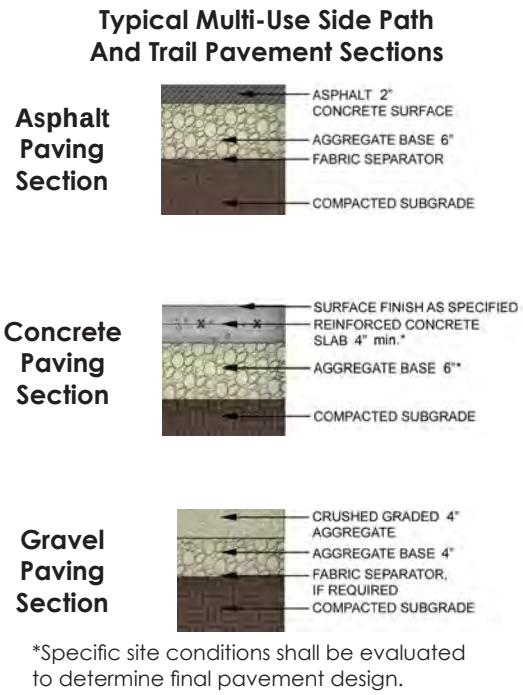


Figure 7.62.4. Typical path and trail sections.

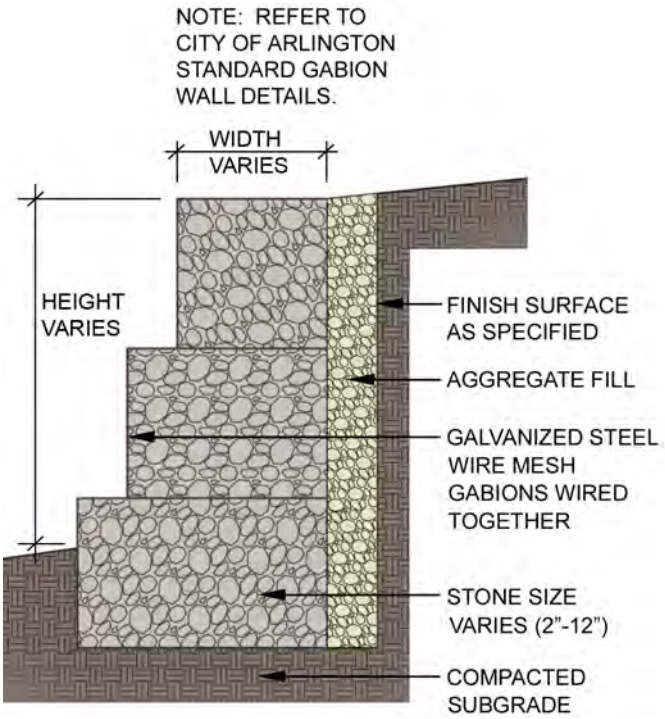


Figure 7.62.5. Gabion Wall with Stepped Face.

buffer set-back requirements when designing multi-purpose paths and trails adjacent to wetlands, creeks, and waterways.

- Provide native landscaping to enhance wildlife and protect natural landscape along trail corridors in areas to be revegetated. Avoid using harmful pesticides and planting invasive plant material.
- When designing a paved trail or path seek a soil engineer evaluation and a geotechnical report of existing site soil conditions to determine final recommendations of trail pavement design.
- Provide a 10-foot shoulder minimum adjacent to waterways, ditches, and steep slopes.
- Elevated structures should be provided when slopes or environmental conditions warrant.
- Provide rest and pull off areas on steep slopes.
- Provide secondary access to canoeing, kayaking and tubing when adjacent to navigable waterways.
- Along with the multi-purpose paths and trails provide the opportunity for designated picnic and seating areas.

Concrete vs. Asphalt Comparison.

Initially, asphalt is cheaper than concrete, but over a life cycle, concrete is considered to have better value. Concrete has a longer service life of roughly 40 years while asphalt's life span is roughly 10-20 years. Concrete does not require as much maintenance (sealing for example) as asphalt requires over a life span. The climate of Texas can cause asphalt to become soft in the hot sun and therefore susceptible to ruts. Installation costs for concrete and asphalt surface projects are not significantly different. Varying reports suggest a life span savings of around 20% with the use of concrete. Refer to Chapter 4 of the City of Arlington's Design Criteria Manual for paving requirements for public and private streets.

Floodway Trails

Floodway trails are typically located within the floodway, where an undisturbed vegetative buffer is located between the stream and trail. Refer to City of Arlington and State Requirements regarding stream buffer setbacks. Floodway trails should be designed to handle periodic flooding. Hard paved concrete or asphalt surfaces are required depending on the frequency of the flooding and expected velocity of flow. The installation of site furnishings should be considered and studied to not obstruct the creek flow during storm events and be selected to withstand periodic flooding. Floodway trails should follow the design criteria outlined under the multi-use trail section. Refer to local, state, and federal requirements regarding stream buffer setbacks (Figure 7.62.6).

Floodplain Trails

Floodplain trails are typically outside the floodway and within the floodplain, where a large undisturbed vegetative buffer is located between the stream and trail. Refer to local, state, and federal requirements regarding stream buffer setbacks. Floodplain trails should be designed to withstand occasional flooding, during large storm events. Hard paved concrete or asphalt surfaces are required depending on the frequency of the flooding and expected velocity of flow. Permeable paving treatments may be considered in environmentally-sensitive areas. Floodplain trails should follow the design criteria outlined under the multi-use trail section and in accordance with the City of Arlington's Design Criteria Manual standards, State, and Federal requirements regarding stream buffer setbacks.

Creekside Trails

Creekside trails are typically located directly adjacent to the stream channel. They are typically located in urban areas, where there are right-of-way constraints. Hard paved concrete surfaces are required to withstand high-velocity stream flooding. Retaining walls or other structural devices may be required to construct and protect trail from erosion and flood damage. The installation of site furnishings should be considered and studied to not obstruct the

creek flow during storm events and be selected to withstand periodic flooding. Creekside trails should follow the design criteria outlined under the multi-use trail section and in accordance with local, state, and federal stream buffer set-back requirements (Figure 7.62.7).

Figure 7.61.6. Typical floodway trail.

Figure 7.61.8. Typical creekside trail.

Secondary Community Trail Access

Secondary community trail access provides bicycle and pedestrian accessways and connectivity to schools, parks, neighborhoods, community centers, retail/entertainment centers and other trail systems. Accessways are intended to reduce unnecessary out-of-way travel for bicyclists and pedestrians. (Refer to Figures 7.62.9 and 7.62.10)

Design Criteria:

- Trail pavement should be a minimum of 8 foot wide to accommodate emergency and maintenance vehicles.
- Trail surface needs to meet ADA requirements and be suitable for multi-use purposes.
- Minimize impact to mature vegetation.
- Landscape to be indigenous to the area.
- Where trail is located to adjacent properties provide a minimum of a 6 foot high privacy fence and landscape screening.
- For paving standards refer to the City of Arlington Design Criteria Manual and the multi-use trail paving recommendations.

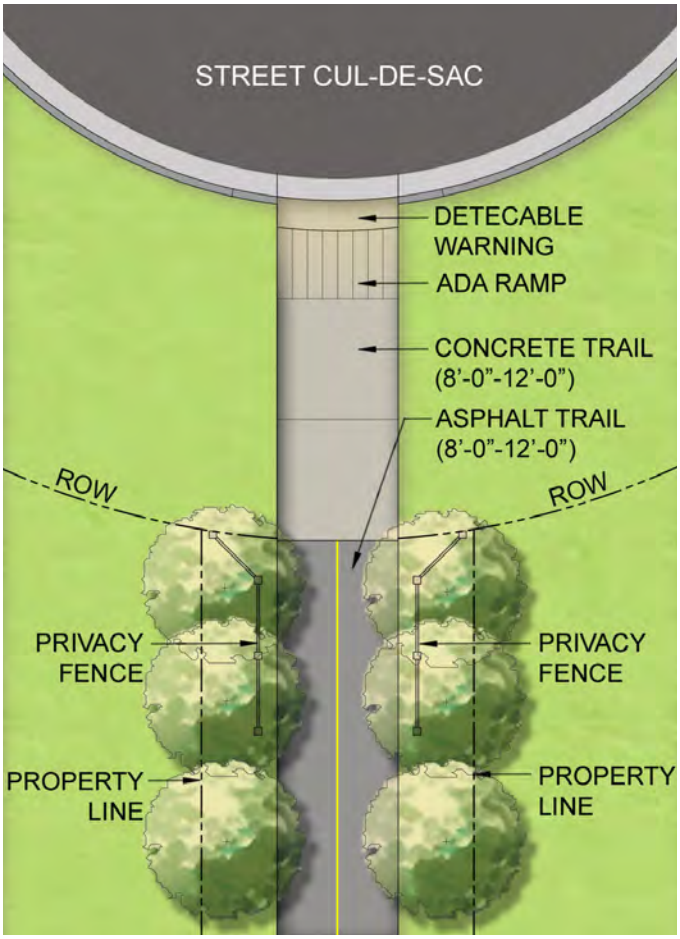


Figure 7.62.9. Secondary Community Trail Access.

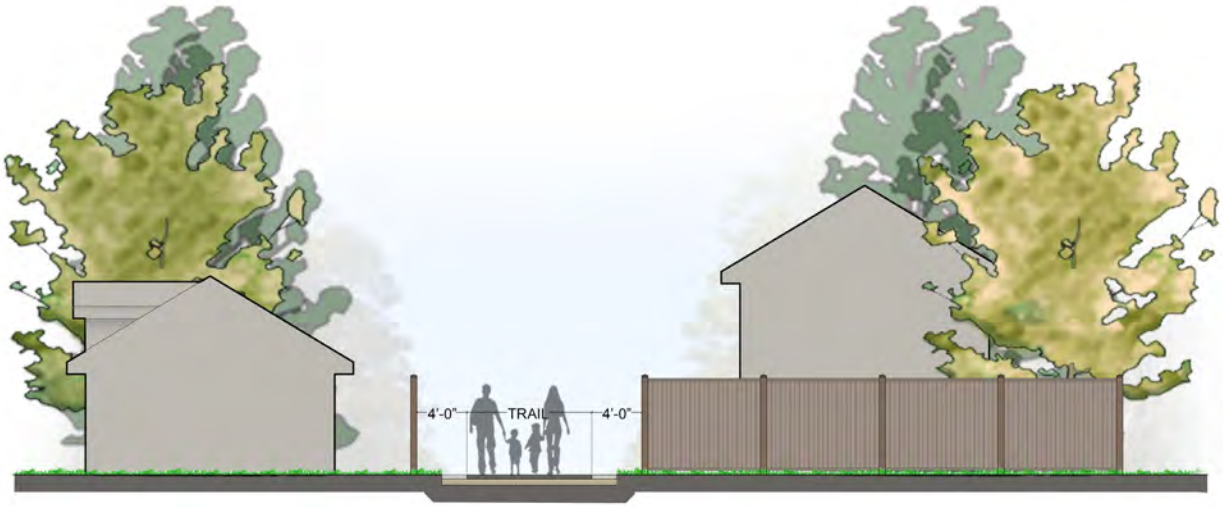


Figure 7.62.10. Secondary Community Trail Access.

7.6.3 Unpaved Multi-Use Trails

In corridors of low trail user volumes, multi-use trails may be unpaved. Unpaved trails may not be safe for all users. While the construction cost may be lower, they tend to have a higher maintenance cost and shorter life-cycle. While bicycle speeds are lower, unpaved trails are not recommended for novice users, for multiple age groups or for motorized equipment (Figure 7.63.1).

Design Criteria:

- A one-way unpaved facility is to be a minimum of 6 feet wide. The clearing and grubbing area is approximately 12 feet wide and the selective thinning area is approximately 20 feet (Figure 7.63.2).
- A two-way unpaved facility is to be a minimum of 10 feet wide. The clearing and grubbing area is approximately 18 feet and the selective thinning area is 30 feet (Figure 7.63.3).
- Selective thinning is meant to increase visibility along the trail or pathway corridor. Mature trees that do not create a visibility hazard should be maintained.
- The recommended pavement surface is crushed aggregate, sand, clay, wood chips, or stabilized earth.
- Provide a 3-foot-wide graded shoulder minimum on 6-foot-wide paths and 5-foot-wide graded shoulders on 10-foot-wide paths.
- Side slopes to be a maximum of 1:6 adjacent to both sides of trail. When the bottom of the slope is unsafe, dense shrubbery, chain link fence, or other physical barrier may be needed.

Figure 7.63.1. Example of unpaved multi-use trail. Unpaved trails usually are gravel, mulch, or natural surface.

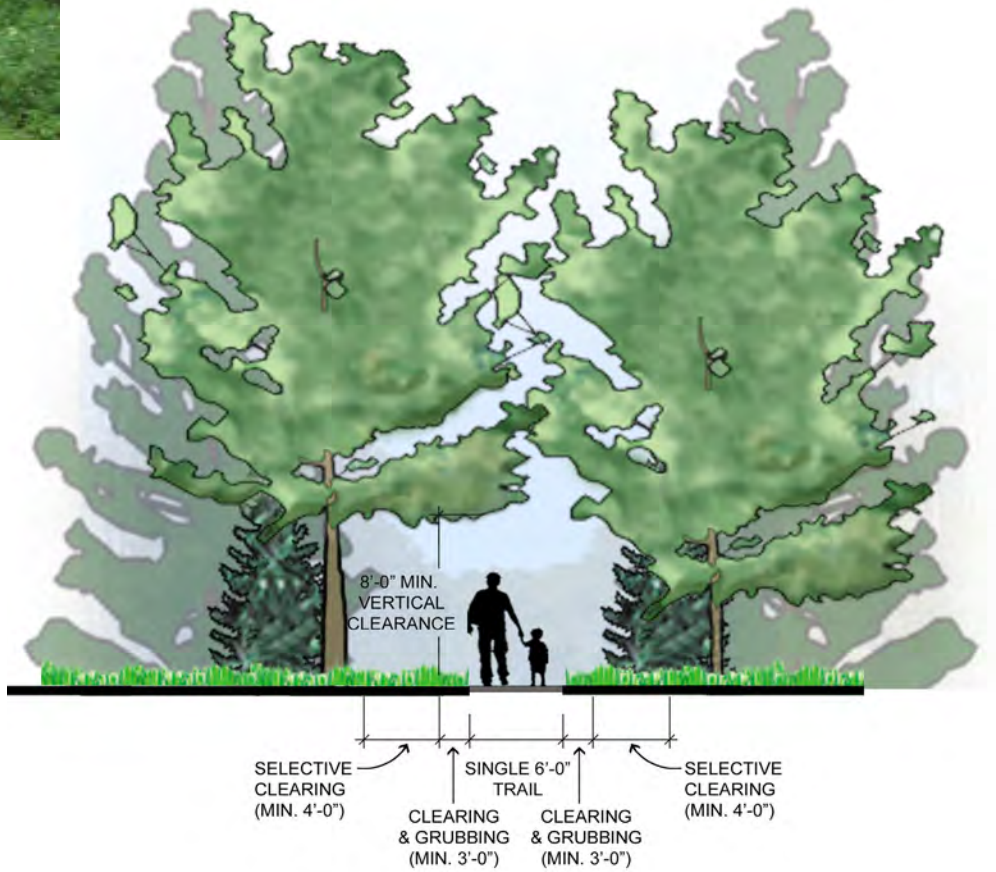


Figure 7.63.2. One-way unpaved 6-foot multi-use trail.

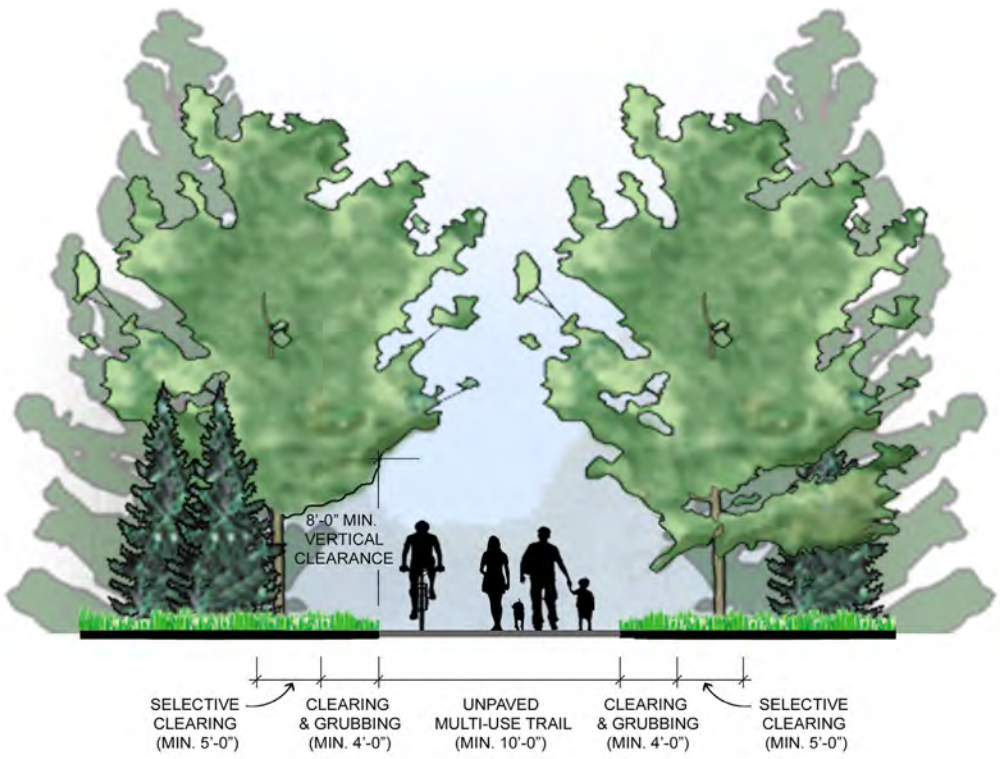


Figure 7.63.3. Unpaved multi-use trail.

- A minimum of 10 foot shoulder is required adjacent to waterways, ditches, and steep slopes. If a minimum 10-foot shoulder distance cannot be provided, a minimum 42" high railing should be installed.
- The minimum vertical clearance is 8 feet with greater clearance for maintenance and emergency vehicles.
- Unpaved areas to be well drained.
- Erosion control measures to be put in place prior to construction.
- Cautionary signs should be provided for steep slopes, blind curves, and other potential hazards.
- Grades steeper than 3 percent are not practical for shared or multi-purpose trails with crushed stone or other unpaved surfaces, due to handling and drainage erosion concerns.
- Location maps, directional, mileage, navigation, and regulatory signage ("rules of the trail") shall be posted.
- Mature native vegetation to be maintained if possible.
- Secondary footpaths and hiking trails to be a minimum of 2'-6" and a maximum 5'-0" in width.
- Provide elevated and boardwalk structures when slopes or environmental conditions warrant.
- Provide rest and pull off areas on steep slopes.
- Provide interpretive signage.
- In addition to unpaved multi-use trails, provide footpaths or hiking trails designated to accommodate pedestrians on foot; not intended for cyclist or wheeled users.
- Provide footpaths or low impact trails to access environmentally sensitive areas.

A. Boardwalks and Bridges

Boardwalks are used to connect trails over environmentally sensitive areas. Boardwalks are typically made of wood timbers, recycled composite plastic, or narrow liner concrete slab. If properly constructed, boardwalks minimize impacts to sensitive areas and can be a good alternative where extensive grading is required (Figure 7.63.4).

Design Criteria:

- Boardwalks to conform to ADA and City of Arlington's Design Criteria Manual standards.
- Railings are required when boardwalks exceeds 30 inches in height above the ground surface.
- Boardwalks to meet bridge structural design standards and be designed with pedestrian loading. Where maintenance and emergency vehicles may be expected to cross a boardwalk, the design should accommodate them.
- Identify floodway and floodplain elevations to determine the height at which the decking can be constructed. Verify with local government authorities prior to construction.
- Refer to bicycle and pedestrian bridge section for railing height standards (Figure 7.63.5).
- Environmental and wetland impacts should be minimized when boardwalks are used.
- Use wood products that are environmentally sensitive and nontoxic to the environment.
- Auger piers are preferred for greater support and durability over wood post foundations.
- Interpretive signage should be provided.
- Materials used to construct boardwalk should be contextually appropriate.
- Lighting may be provided at trailheads.

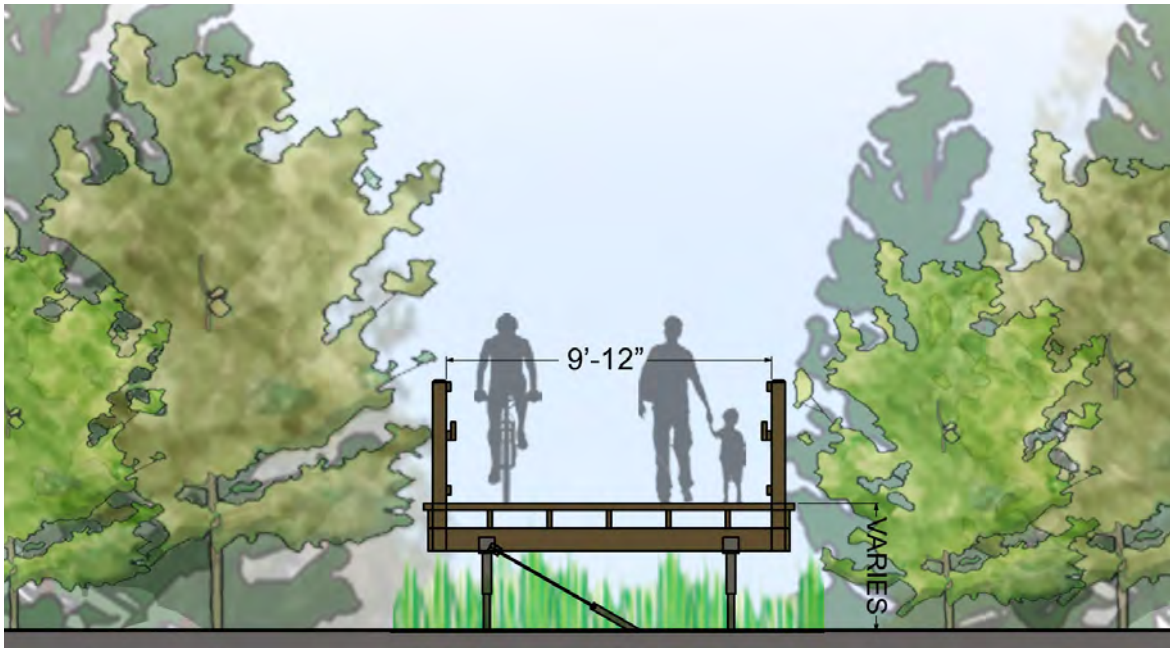


Figure 7.63.4. Multi-use trail boardwalk section.

B. Pedestrian and Bicycle Bridges

In environmentally sensitive areas where boardwalks may not be possible, such as over a wide stream, river, or roadway, building pedestrian and bicycle bridges may be the best option to continue access. Bridges may be more expensive than boardwalks, but greatly minimize impacts to the adjacent areas. Existing abandoned railroad bridges could be reused if the structural integrity is approved by an engineer.

Design Criteria:

- The bridges must conform to ADA, AASHTO, local, and state regulatory standards.
- Refer to AASHTO for information about load bearing capacity of bridges.
- Railings on bridges and boardwalks used by pedestrians to be a minimum of 42 inches high.
- Railings on bridges and boardwalks where bicyclists are present to be a minimum of 54 inches in height. The higher railing height is due to a bicyclists higher point of gravity. (Refer to figure 7.63.5 and 7.63.6)
- On new structures, the minimum clear width should be the same as the approach paved surface, plus a minimum of 2 feet wide on each side. The clear areas provide the opportunity to avoid conflicts between bicyclists, railings, handrails, and other bicyclists who may have stopped on the bridge.
- Prior to design of pedestrian and bicycle bridge crossing, define the floodway and floodplain elevations. This data will determine the minimum height at which the bridge decking can be constructed. The proposed bridge installation shall be verified with local government authorities prior to construction.
- Consider using prefabricated pedestrian bridges.
- Materials utilized to construct bridges should be contextually appropriate.
- Provide lighting as needed and where street lighting is not present.

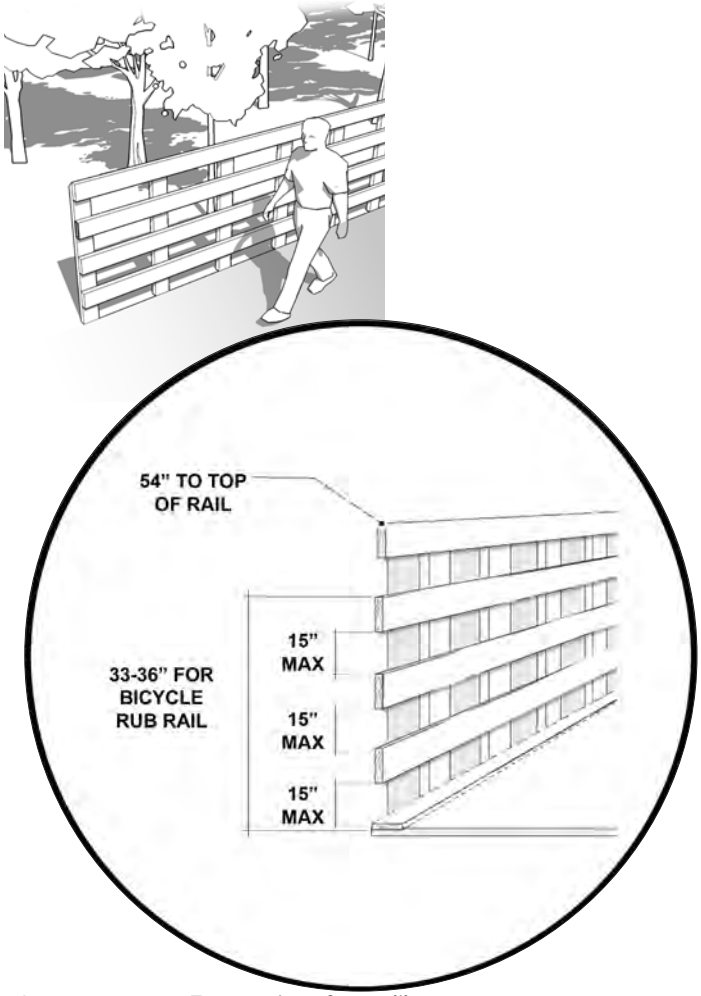


Figure 7.63.5. Example of a railing.

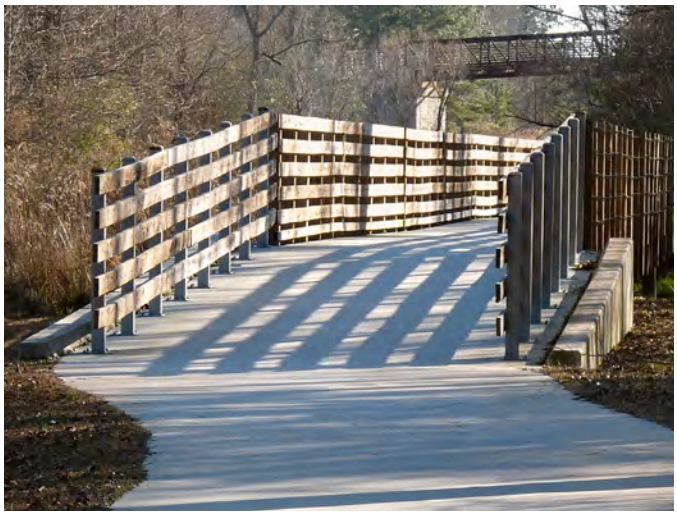


Figure 7.63.6. Example of boardwalk and bridge railing for bicyclists and pedestrians.

Figure 7.63.7. Pedestrian and bicycle bridge.

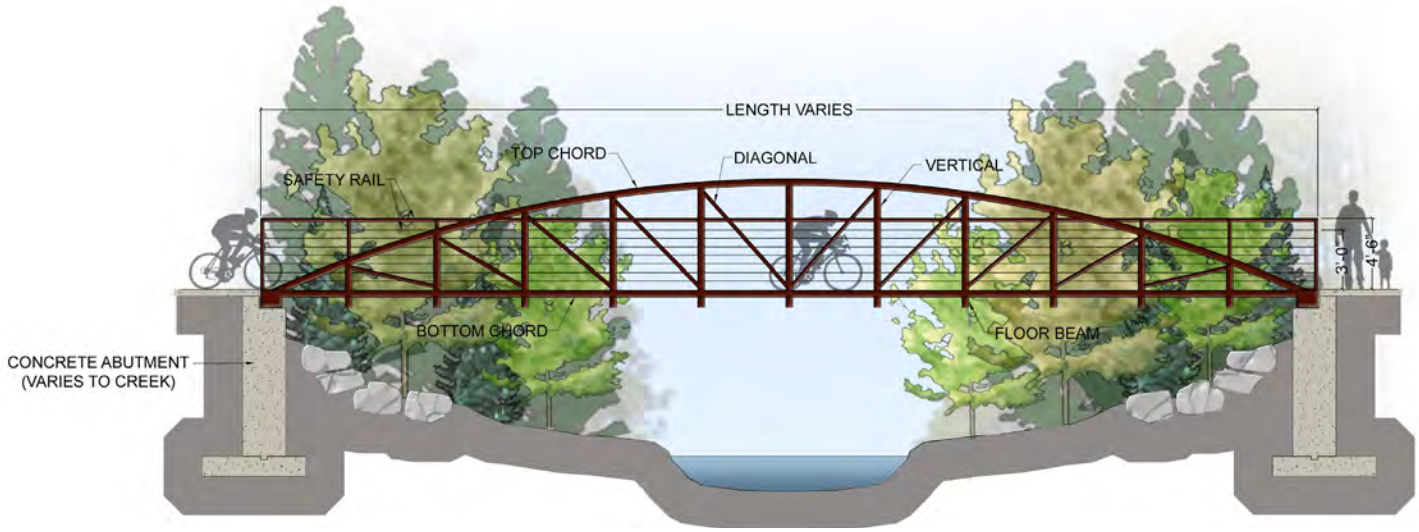


Figure 7.63.8. A section of a pedestrian and bicycle bridge.

7.6.4 Trailheads And Support Facilities

There are different sizes of trailhead facilities. Minor trailheads are smaller and simpler in character and offer pedestrians and bicycle entrances in parks and residential communities. Major trailheads should be located near commercial developments and transportation nodes, making them highly accessible to the overall community (Figures 7.64.1 and 7.64.2).

Design Criteria for Minor Trailheads

- Adequate Parking
- Drinking Fountains
- Benches
- Bicycle Racks
- Trash Receptacles
- Information Kiosk
- Signage, including location maps, directional, mileage, emergency, and navigational information.

Design Criteria for Major Trailheads

- Adequate Parking
- Drinking Fountains
- Benches
- Bicycle Racks
- Trash Receptacles
- Information Kiosk
- Signage includes information in minor trailhead facilities plus points of interest and education.
- Restrooms
- Shelters
- Picnic Areas
- Bicycle Rental & Storage Facilities
- Air Compressors
- Emergency Phone Services

Figure 7.64.1. Example of trailhead

Figure 7.64.2. Example of trailhead.

There is a wide variety of site furnishings available to choose from in terms of style and materials. Material selection should be based on desired design theme, location that it is used, cost, and durability.

Bench Design Criteria:

- Benches should have back rest.
- Benches are 18"-20" above ground.
- Benches are 48" to 96" in length.
- All benches are constructed of either recyclable materials, finished wood (mahogany or similar material), powder-coated steel, or cast iron (Figure 7.63.2).

Trash Receptacle Design Criteria:

- Trash receptacles should be constructed of a suitable material to withstand the harsh elements of the outside environment; including weather and wildlife.
- Tops or lids should be able to be secure.
- Trash receptacles should be a minimum of 32 gallon, with a side door opening, large bearing stainless steel hinge pins.
- Provide latch and padlocks on all door openings.
- Trash receptacles should be constructed of either recyclable materials, finished wood (mahogany or similar material), powder-coated steel, or cast iron.
- Trash receptacles to be placed at trailhead locations and periodically (plus or minus half a mile) along trail to combat littering and preserve a clean environment for all users (Figure 7.64.3).

Picnic Table Design Criteria:

- Picnic tables should be constructed of either recyclable materials or finished wood (mahogany, redwood, or similar material).
- Picnic tables should be either square or rectangle. Square tables to be 4'x4' and the rectangle tables to be 4'x8'.
- Picnic tables should be ADA accessible.
- Picnic tables should have 4-inch square structural steel center post (Figure 7.64.4).

Figure 7.64.3. Examples of benches and trash receptacles.

Figure 7.64.4. Example of picnic table.

7.7 PEDESTRIAN & BICYCLE SIGNAGE

Signage includes visual graphics that display specific information to an audience. A unified system of signs improves the movement of motorists, bicyclists, and pedestrians, and minimizes conflicts for all users. These include identification, directional, informational, and regulatory signs. A comprehensive system of signage ensures that information is provided regarding the safe and appropriate use of all facilities. Implementing a well planned and attractive signage system can greatly enhance a hike and bikesystem by signaling their presence and location to both motorist and existing or potential users.

A. Pedestrian and Bicycle Wayfinding Signage

Pedestrian and bicycle signage is often part of an overall wayfinding signage system. Signage should have a clear message, be easy to read, with simple colors and be standard in dimension to minimize maintenance and cost. A wayfinding signage system for on-and off-street bicycle route network should include directional, educational, and interpretive points of interest (Figures 7.7.1 and 7.7.2).

Figure 7.7.1. Example of signage.

Design Criteria:

- Signage should be post or pole mounted or integrated within a kiosk or information booth.
- Maintain minimum clearance heights and setbacks when locating signs along pedestrian and bicycle facilities.
- Signage should conform to MUTCD and AASHTO Guide for Development of Bicycle Facilities.
- Add city name, logo, and name of pathway to bicycle signage to make distinctive and unique to the City of Arlington.

Figure 7.7.2. Example of kiosk.

B. Special Purpose and Directional Signage

The purpose of signage can be to identify routes for motorists, pedestrians, and bicyclists; provide destination and distance information; and warn users about changes in conditions. An efficient and effective directional signage system can enhance and provide for a safer experience for pedestrians and bicyclists (Figure 7.7.3).

Design Criteria:

- Signs should be pole- or post-mounted.
- Signs should conform to City of Arlington, MUTCD, and AASHTO design standards.
- Provide special purpose and directional signs on a bike route map, allowing for better hike and bike planning to occur.
- Provide uniform color and City of Arlington logo on special purpose and directional signage.

* A fluorescent yellow-green background color may be used for this sign or plaque. The background color of the plaque should match the color of the warning sign that it supplements.

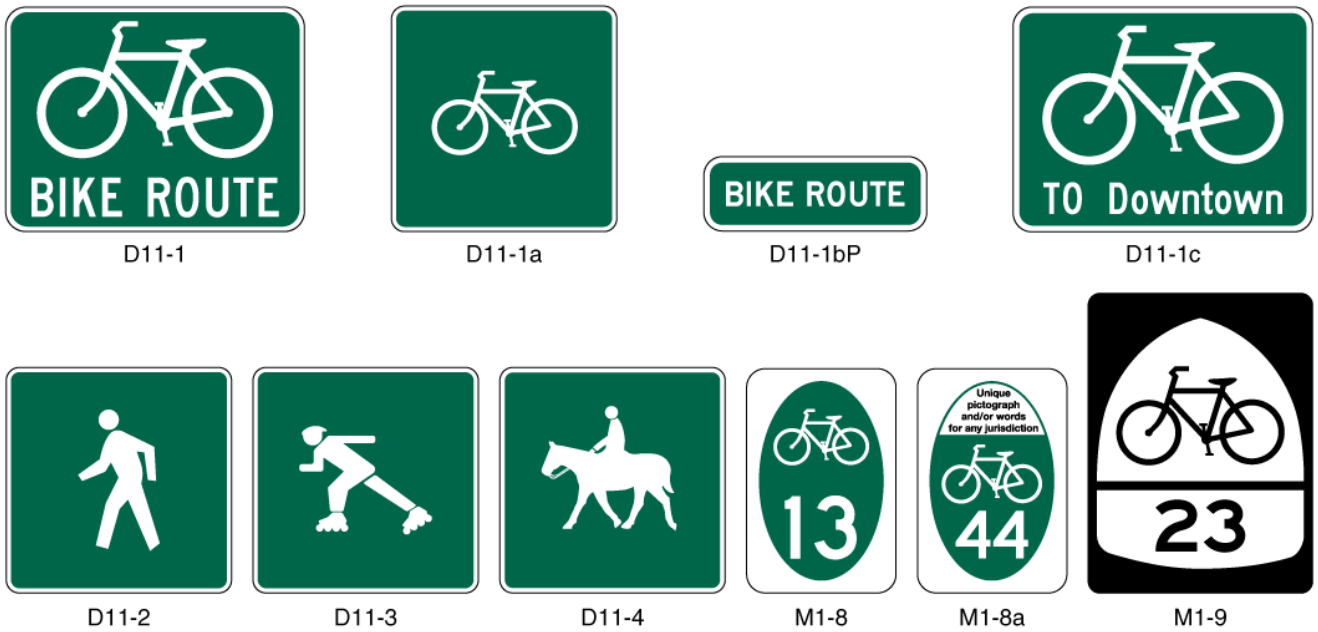


Figure 7.7.3. Examples of special purpose and direction signage.

C. Regulatory or Warning Signs

These signs are often standard in dimensions and have specific information. Installed adjacent to the street, these signs contain information such as speed limit and parking rules. Regulatory signs are used to inform roadway users of a legal requirement. Warning signs are used to inform roadway users of unexpected or unusual conditions (Figures 7.7.4 through 7.7.9).

Design Criteria:

- The signage should conform to City of Arlington MUTCD, and AASHTO, design standards.
- Signs should be pole or post mounted.

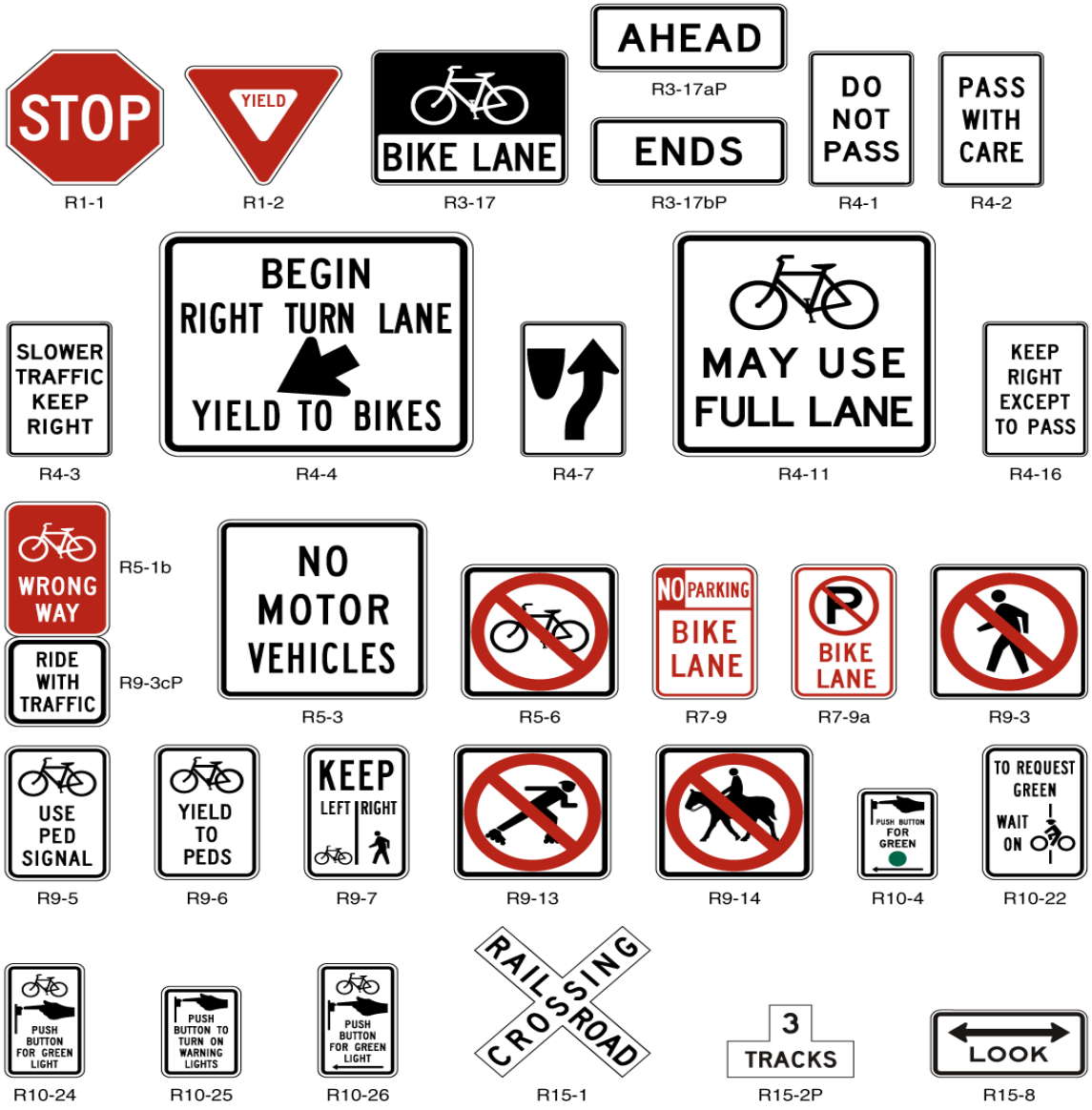


Figure 7.7.4. Examples of regulatory signage.

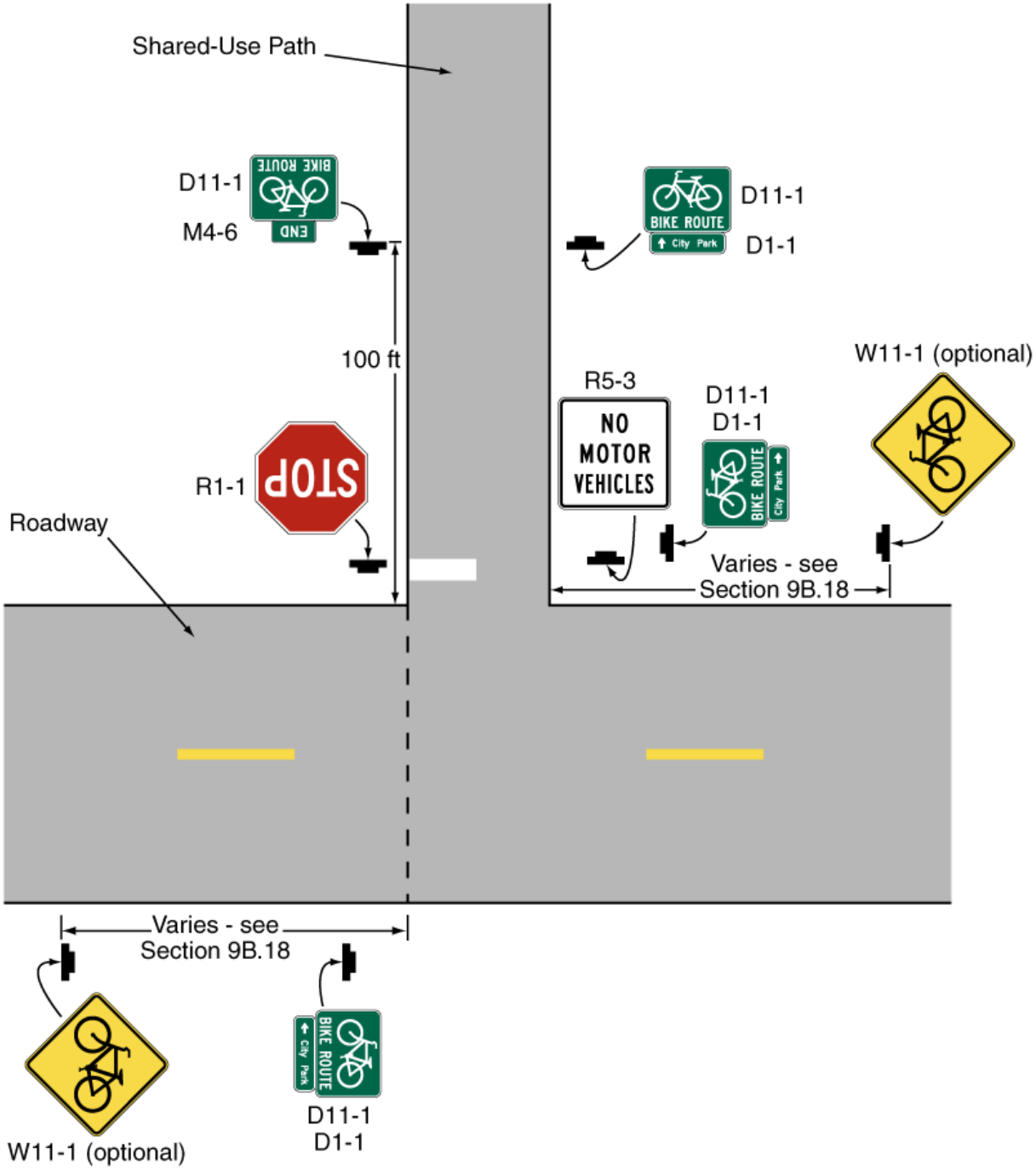


Figure 7.7.5. Example of signing for the beginning and end of a designated bicycle route on a shared-use path.

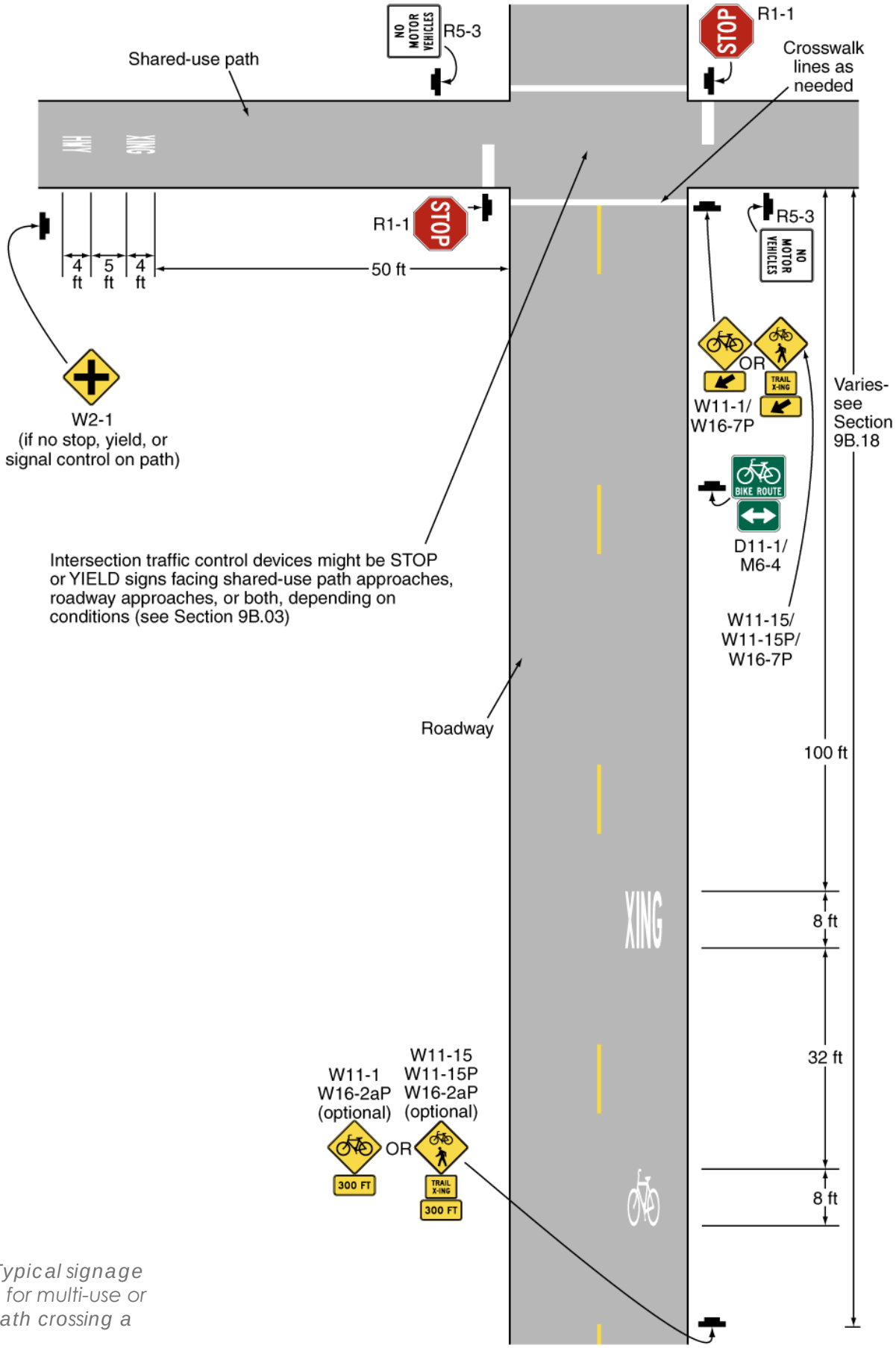


Figure 7.7.6. Typical signage requirements for multi-use or shared use path crossing a roadway.

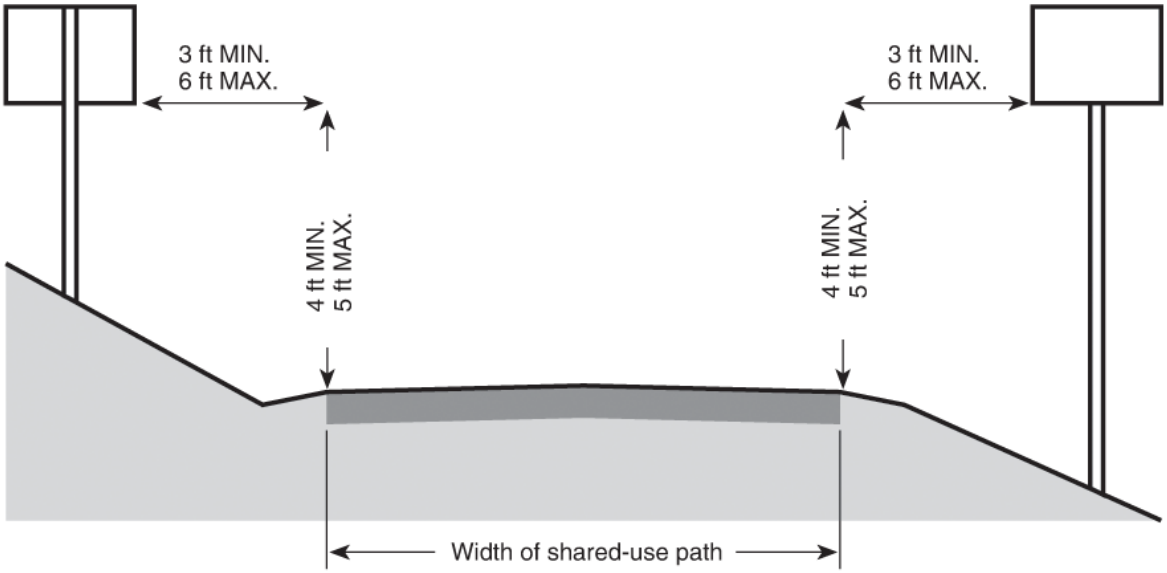


Figure 7.7.7. Typical setback for signage along shared use path.

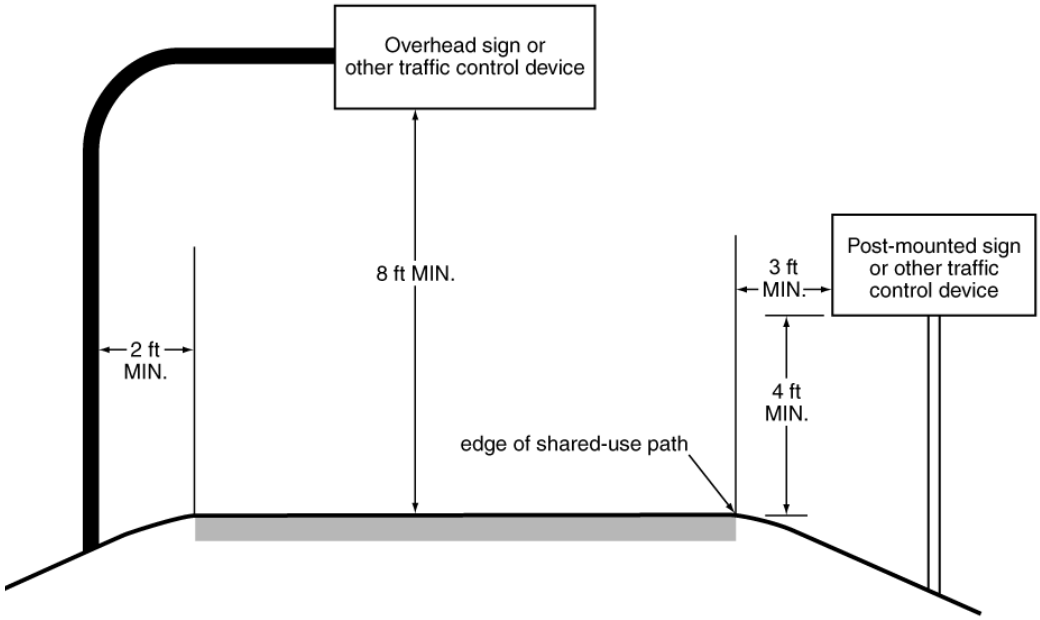


Figure 7.7.8. Sign placement on multi-use or shared-use paths.

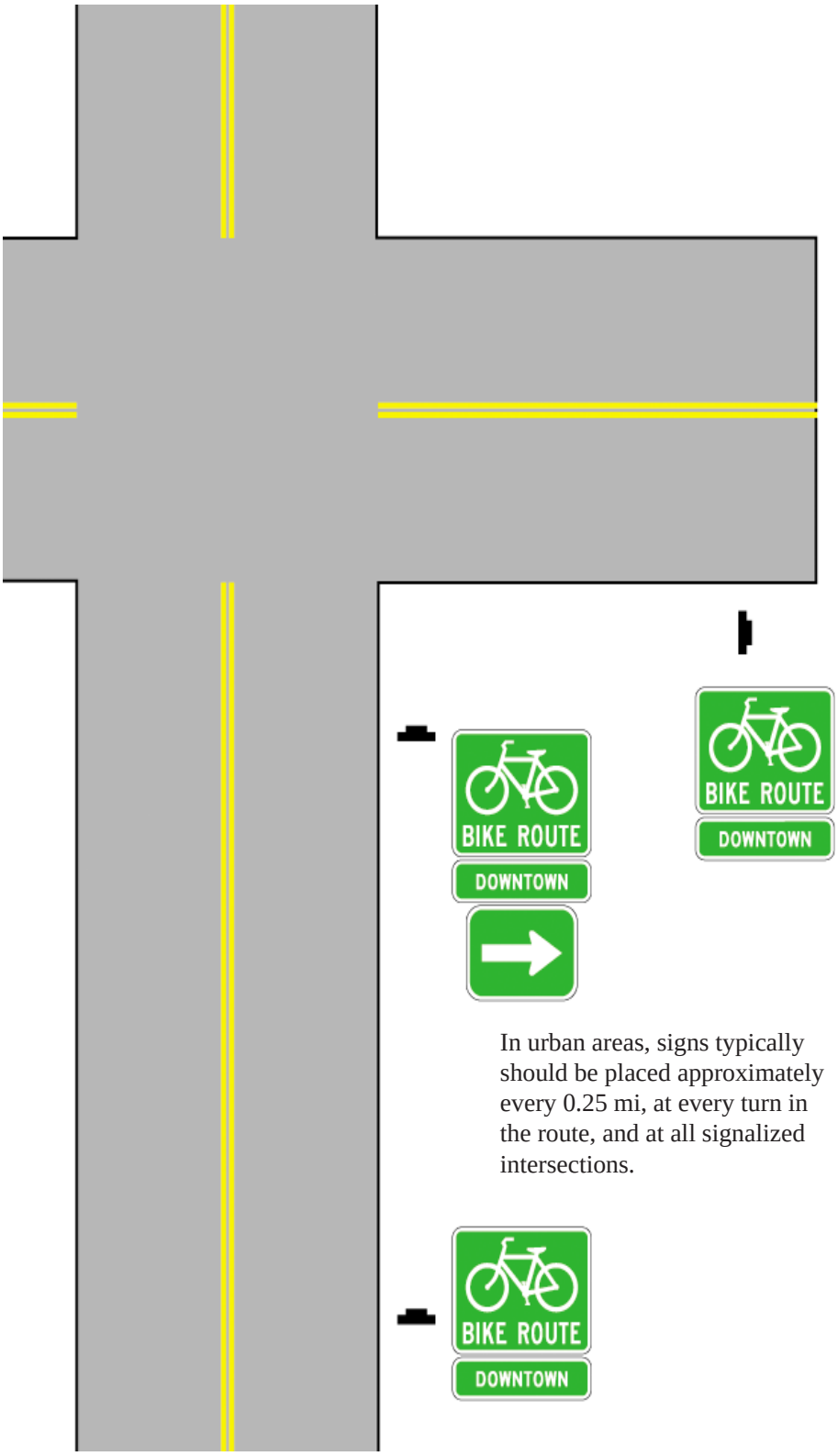


Figure 7.7.9. Example of Typical Sign Placement at the intersection of multi-use trail.

7.8 BICYCLE PARKING & STORAGE

To encourage and facilitate bicycling in Arlington, bicycle parking and storage should be provided at specific points along bicycle routes. Bicycle parking, such as bike racks, should be available for short-term or daily-use. For long-term use (more than 24 hours) bicycle storage is recommended. Bicycle parking and storage should be easily accessible.

A. Bicycle Racks and Standards

Bicycle racks provide a secure place for short and long-term parking of bicycles. They are best located at the entrance of a park, trail head, or other public places, but should be clear of the throughway zone in a sidewalk (Figures 7.8.1 to 7.8.5).

Figure 7.8.1. Example of a functional decorative bike rack.

Design Criteria:

- Provide long-term parking for bicycle to be protected from the weather and secured from potential theft.
- Provide bike racks that secure at least the frame and one of the tires and allow adequate spacing between racks so bikes are easy to maneuver.
- Locate bike racks so they do not obstruct pedestrian or wheelchair movement.
- Locate bike racks in well-lighted and highly visible areas in order to minimize theft and vandalism.
- Avoid installing bicycle racks inside designated loading/unloading, passenger, and pedestrian zones.
- For schools, retail, public buildings, and commercial uses; half of the bicycle parking spaces shall be provided as long-term parking.
- Bicycle racks should be at the same grade as the sidewalk or at a location that can be reached by an accessible route.
- Bicycle racks should be within 50 feet of the main entrance to a building as measured along the most direct pedestrian access route, for a building with more than one main entrance, bicycle racks should be placed at each main entrance.
- If bicycle parking is more than 50 feet from a main entrance, it should be in a central location preferably along a pedestrian route.
- When a bike is parked at a rack there should be no less than 2 feet from the curb and 36 inches from any permanent object to allow for adequate maneuvering space for the bicyclist and for motorists accessing parked vehicles.
- Maintain a 5 feet minimum access aisle or sidewalk adjacent to bike racks.
- There should be at least 2 feet of clearance beside each parked bicycle when installing multiple racks.
- Prevent the wheel of the bicycle from tipping over.
- Support bicycles without a diamond-shaped frame with a horizontal top tube.
- Allow front in parking: a U-lock should be able to lock the front wheel and the down tube of an upright bicycle.
- Allow back-in parking: a U-lock should be able to lock the rear wheel and seat tube of the bicycle.
- Refer to Figure 7.8.5 for guidelines for bicycle parking locations and quantities of facilities.

- Refer to the Association of Pedestrian and Bicycle Professionals (APBP) Guide on Bicycle Parking for more information.
- Comb, toast, and other wheel-bending racks that provide no support for the bicycle frame are NOT recommended.
- The rack element should resist being cut or detached using common hand tools, especially those that can be concealed in a backpack. Such tools include bolt cutters, pipe cutters, wrenches, and pry bars.

INVERTED "U"

One rack element supports two bikes.

"A"

One rack element supports two bikes.

POST AND LOOP

One rack element supports two bikes.

COMB

One rack element is a vertical segment of the rack.

NOT RECOMMENDED

WAVE

One rack element is a vertical segment of the rack.

TOAST

One rack element holds one wheel of a bike.

Figure 7.8.2. Recommended guidelines for bicycle parking from the Association of Pedestrian and Bicycle Professionals, 2002, (www.apbp.org).

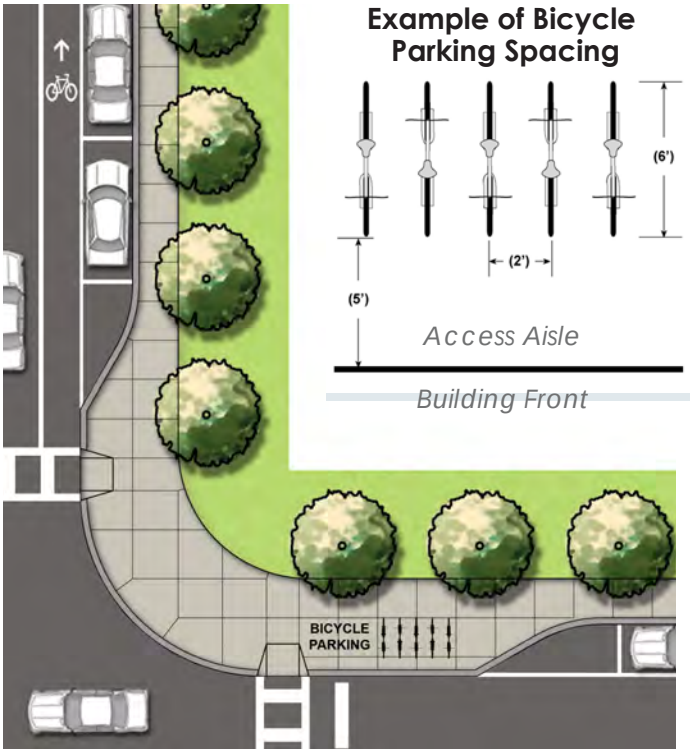


Figure 7.8.3. Example of bicycle parking near urban intersection.

Figure 7.8.4 Example of a well designed bicycle parking area using the single inverted "U" bike rack that can accommodate two bicycles per bike rack.

Land Use or Location	Physical Location	Bicycle Capacity
City Park	Adjacent to restrooms, picnic areas, fields, and other attractions	8 bicycles per acre
City Schools	Near office entrance with good visibility	8 bicycles per 40 students
Public Facilities (City hall, libraries, community centers)	Near main entrance with good visibility	8 bicycles per location
Commercial, retail and industrial developments over 10,000 gross square feet	Near main entrance with good visibility	1 bicycle per 15 employees or 8 bicycles per 10,000 gross square feet
Shopping Centers over 10,000 gross square feet	Near main entrance with good visibility	8 bicycles per 10,000 gross square feet
Commercial Districts	Near main entrnace with good visibility; not to obstruct auto or pedestrian movement	2 bicycles every 200 feet
Transit Stations	Near platform or security guard	1 bicycle per 30 parking spaces

Figure 7.8.5. Recommended guidelines for bicycle parking locations and quantities.

B. Bicycle Stations

Bicycle stations offer secure bicycle parking and other services to bicyclists. These services may include bicycle rentals and repair, bike accessories, showers, restrooms, lockers, and 24-hour secure bike parking. In addition, food and beverages are sometimes served at these stations (Figure 7.8.6).

Design Criteria:

- Parking should be provided for loading and unloading of bikes when bicycle stations are provided.
- Bicycle racks should be provided.
- Benches for seating should be provided.
- Provide drinking fountains and air compressors.
- Restroom facilities should be provided.
- Lighting should be provided.
- Secured storage and covered parking for bikes should be provided.
- Provide appropriate signage addressing bicycle maintenance and storage.
- Fee membership should be required.

Figure 7.8.6. Examples of bicycle stations/lockers. Bicycle lockers offer safe and secure storage at popular destinations. Parking rates are reasonably priced at about 3-5 cents an hour. (www.bikelink.org)

C. Bike Sharing Programs

Bike sharing programs, typically run by municipal governments or community groups, allow people to shift easily from other forms of transportation to bicycle and back again. This promotes bicycle sharing as an easily accessible alternative to motorized travel and enables residents to become healthier through exercise. Bike sharing programs have been operating successfully in Portland, OR; Madison, WI; Washington, DC; and in European countries (Figure 7.8.7).

Bicycles should be made available for shared use by individuals who do not own bicycles. The sharing program should provide for use of a bicycle for short trips inside a "bike zone," thereby reducing traffic congestion, noise, and air pollution. Bike share programs typically require a small deposit to prevent theft.

Design Criteria:

- Fleets should be distinctive, and clearly branded.
- Bikes should come with full fenders, chain guards, and bike locks.
- Global positioning systems (GPS) unit and/or other tracking mechanism should be mounted.
- Provide rack or kiosk for collecting bikes using a credit card or smart card.
- Provide instructions on where and how to return bicycles.
- Provide information on pricing and contact information to report damage.
- Provide a computerized system to check bicycles in and out.
- Provide maps of nearby stations and recommended bike routes.
- Determine direct capital cost (bikes and terminals) operating cost, (administrative, maintenance, power), associated capital cost (construction of system, sidewalk improvements) and the associated operating cost (maintenance) prior to making a commitment to develop a bike share program.
- Develop a public private partnership in operation of bike share program.

Figure 7.8.7. Examples of bicycle sharing programs.

7.9 TRAFFIC CALMING

Developing traffic calming devices throughout the transportation network will help to increase area-wide safety and traffic management. Well-designed traffic calming devices can effectively reduce traffic speeds and volumes, while maintaining local access to neighborhoods. A few of the benefits of traffic calming for bicycling and walking, especially along local streets, include:

- Reduced traffic speed allows bicyclists and pedestrians to safely share the road.
- Treatments, such as improved crossings, enhance the pedestrian environment.
- Traffic calming allows all ages and abilities to use the streets either for walking or biking.

A. Traffic Circles and Roundabouts

- Traffic circles and roundabouts allow bicyclists to maneuver through the intersection in a safe manner. They also slow motor vehicles to a desired speed (Figures 7.9.1 through 7.9.4).
- They may reduce points of conflict between pedestrians and motor vehicles.

Design Criteria:

- Terminate bike lanes before roundabout entrances to allow bicyclists to merge with motor vehicles or allow bicyclists to enter sidewalk.
- Provide adequate radius, offset distance, circle diameter, opening width, and turning for vehicular speeds.
- Provide a refuge to allow safe crossing of travel lanes.
- Maintain and avoid blocking motorist and pedestrian sight lines with landscape enhancements in the roundabouts.
- Provide landscape, lighting, and signage improvements in center of traffic circle or roundabouts.
- Provide mountable curbs at the perimeter of the traffic circle to allow large vehicles, including emergency vehicles, to drive over the edge of the circle, if needed.

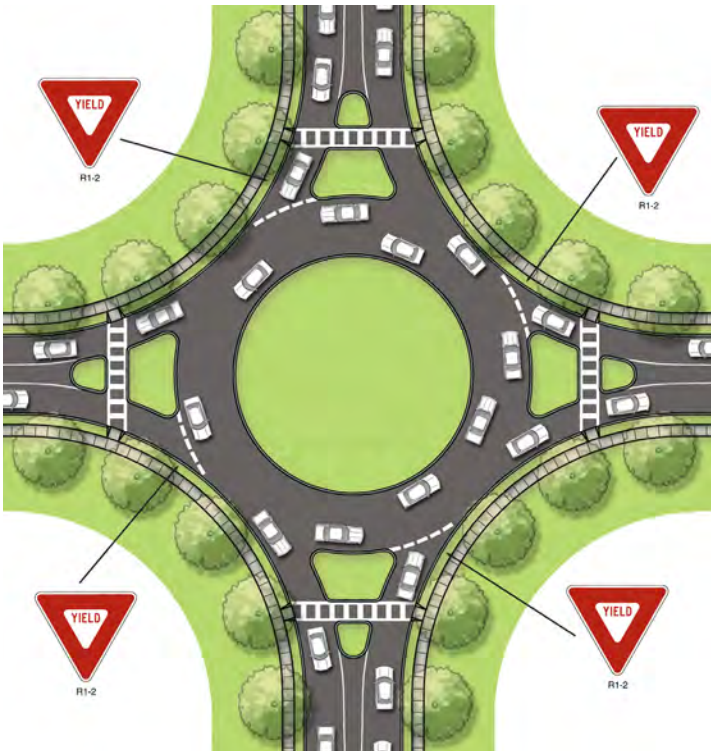
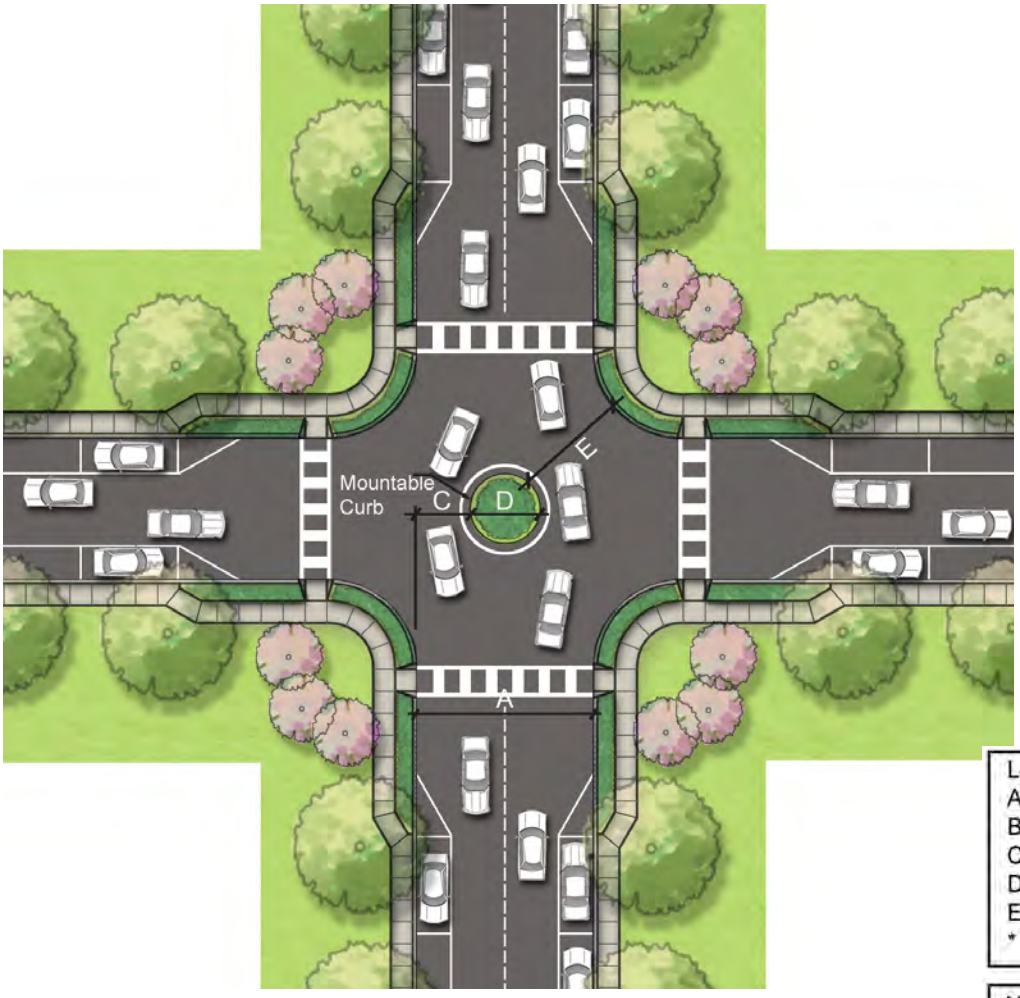


Figure 7.9.1 Example of a roundabout.

Figure 7.9.2 The roundabout at Road to Six Flags and Nolan Ryan Expressway is a pedestrian and bicycle friendly traffic calming device.

Figure 7.9.3. Examples of traffic circles and mini-circle traffic calming devices.

Site Plan of Mini-Circle Traffic Calming Device



Legend
A - Street Width - 32 feet min.
B - Cross street width (varies) 32 feet min.
C - Travel width (10'*)
D - Circle diameter (12' min.)
E - Opening width (18' min.)
* where A<B

Note: To provide for emergency vehicles, traversable low profile landscaping should be used.

Figure 7.9.4. Examples of traffic circle added to existing roadway.

B. Narrow Streets and Travel Lanes

Wide travel lanes often encourage a higher speed of travel, which is unsafe for all users, especially bicyclists and pedestrians. Narrowed streets are either physically narrower or create a perception that they are narrower as a method of calming traffic. Reduced street widths in residential, suburban, and commercial areas are more commonly allowed by local jurisdictions. Narrow streets not only provide the benefits of traffic calming, but also help to create a more attractive and pedestrian friendly character along the street. When the driver's vision is narrowed, the automatic response is to slow down. An effective method to reduce traffic speed is reducing travel lane width and adding on-street parking when roadway width allows. This alternative would allow drivers to adjust to the available lane width and street conditions, while reducing construction and maintenance costs (Figure 7.9.5).

Design Criteria:

- Where appropriate, reduce travel lanes to a minimum of 10 feet to reduce speeds.
- Provide street trees in planting strip along streets to create the perception of narrow lanes.
- Traffic study should be conducted prior to narrowing lane width to ensure safety and traffic management can be addressed.
- Refer to the City of Arlington Thoroughfare Development Plan for the required dimensions of roadways.
- Select and provide appropriate shade trees to survive harsh roadway and environmental conditions.
- Select street trees that can be limbed up to avoid pedestrians and motorist impacts.
- Locate and plant trees back from travel lane to avoid impacting motorists.
- Evaluate drainage and utility cost prior to narrowing of the road or the relocation of curb and gutter.

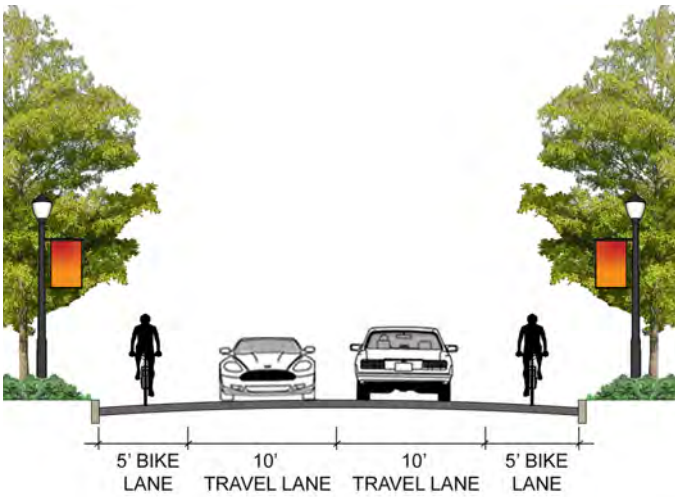


Figure 7.9.5. Examples of narrow streets and travel lanes.

C. Speed Humps/Speed Tables

Speed humps are used to reduce traffic speed by having a gradual mountable slope which would present a minimal discomfort for slower traffic, but would be uncomfortable for drivers at higher speeds. Speed humps are generally installed on local streets with high pedestrian and bicycle traffic, such as adjacent to schools and Main Streets. Bicyclists can ride over speed humps safely (Figures 7.9.6)

Speed tables are similar to raised crosswalks but are used for reducing vehicular speeds only. A raised speed table can be constructed similarly to raised crosswalks but will not include signing and marking for pedestrian crossings (Figures 7.9.7).

Design Criteria:

- Speeds humps are located on streets that have more than 300 and less than 3,000 trips a day.
- Reduce speed between speed humps to 15-20 mph.
- Install street signage indicating speed hump approach a minimum of 100 feet in advance.
- Install speed humps 300 to 400 feet apart on a road.
- Speed humps to be 200 to 300 feet from intersections.
- Add speed limit of 15 mph over speed hump.
- Install pavement marking, including indicating speed hump ahead, white striping and white reflectors.
- Refer to Figures 7.9.8 and 7.9.9 for typical speed hump detail and plan.
- Maintain minimum travel lane requirements per City of Arlington Design Criteria Manual and the Thoroughfare Development Plan.
- A speed table is a reverse curve with a level area in the middle and then another reverse curve. The level area in the middle is approximately the width of a motor vehicle wheel base.
- Refer to Figure 7.9.10 and 7.9.11 for a typical raised speed table detail and plan.
- Evaluate storm drainage design and driveway locations prior to installation of speed humps.

Figure 7.9.6. Perspective sketch of speed hump.

Figure 7.9.7 . Perspective sketch of speed table.

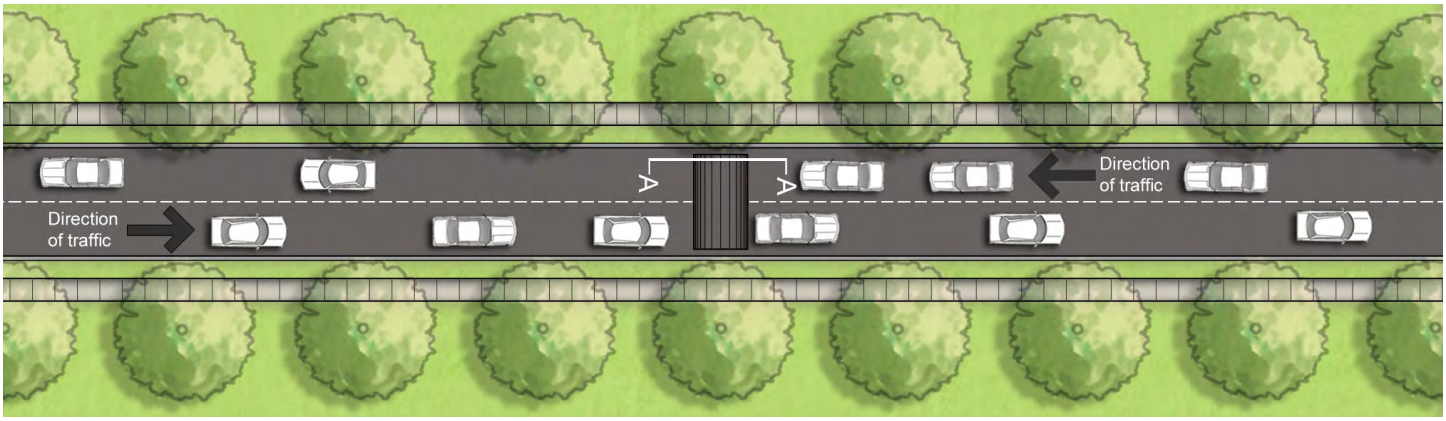


Figure 7.9.8. Site Plan of Speed Hump. Refer to City of Arlington's speed hump/bump policy.

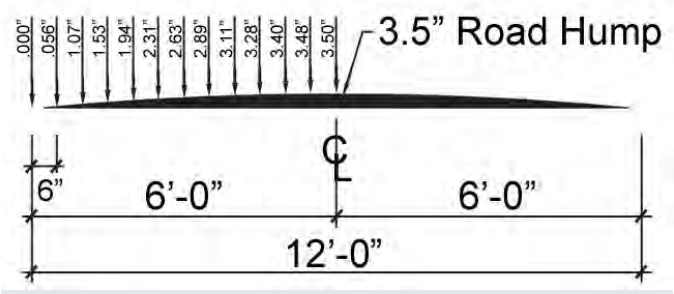


Figure 7.9.9. Speed Hump Section A-A

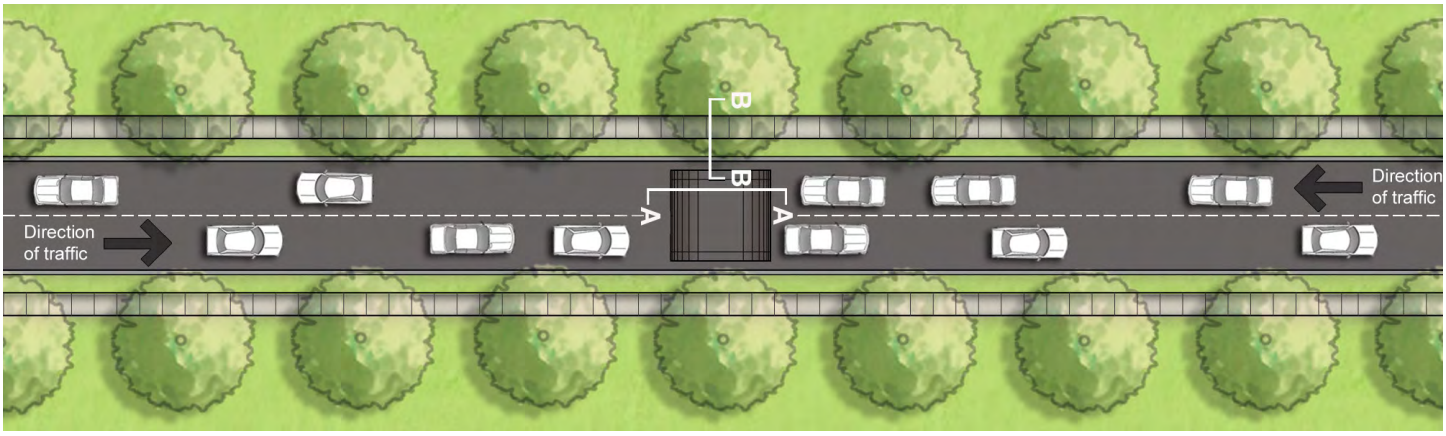


Figure 7.9.10. Site plan of raised speed table used as a traffic calming device.

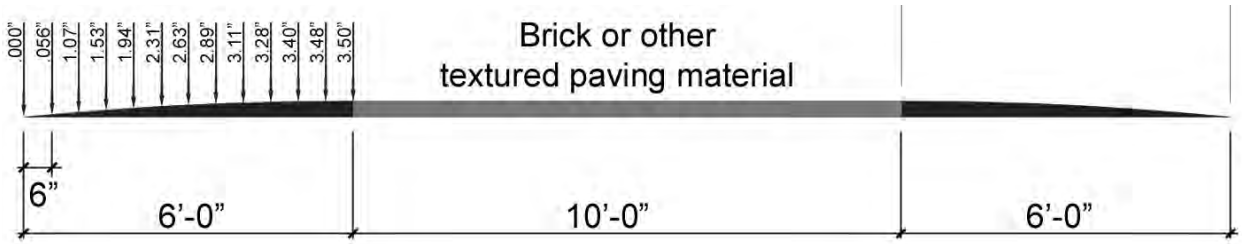


Figure 7.9.11. Example of raised crosswalk or speed table (Section A-A).

D. Chokers

Chokers, also commonly known as bulb outs, curb extensions, or neck downs, are typically installed at curb radii. By adding chokers to curb radii, they reduce distance for pedestrians to cross streets. By reducing the distance to cross a street, pedestrian safety and vehicle movement improves (Figure 7.9.12 and 7.9.13).

Chokers can be used on one side of a one-way street radius and at mid-block crossings where pedestrian traffic is high, such as in downtowns or Main Streets. They can be used at intersections to create a one-way entry or exit point for that specific street alignment.

Chokers are best used where on-street parking is dominant. When chokers are used in conjunction with landscape treatments they can enhance the street and buffer adjacent parking. Chokers help to identify mid-block crossing locations for motorists. They can be used at intersections with high volumes of traffic and significant numbers of crossings, or on minor access roads and local residential streets where there is insufficient time to cross the street.

Design Criteria:

- Maintain pedestrians' and motorists' visibility.
- Provide appropriate traffic signage and traffic signals at intersections and mid-block crossings.
- Provide lighting (street-level or pedestrian-level) and marked crosswalks to enhance pedestrian visibility for mid-block crossings.
- Provide adequate radius for intersections and vehicular turning movement.
- Provide median and refuge islands when the length of the crossing exceeds 33 feet or with three or more travel lanes.
- Evaluate storm drainage and utility locations prior to design and installation of chokers, curb extensions, or bulb outs.
- Provide low growing landscape and plant material in islands.

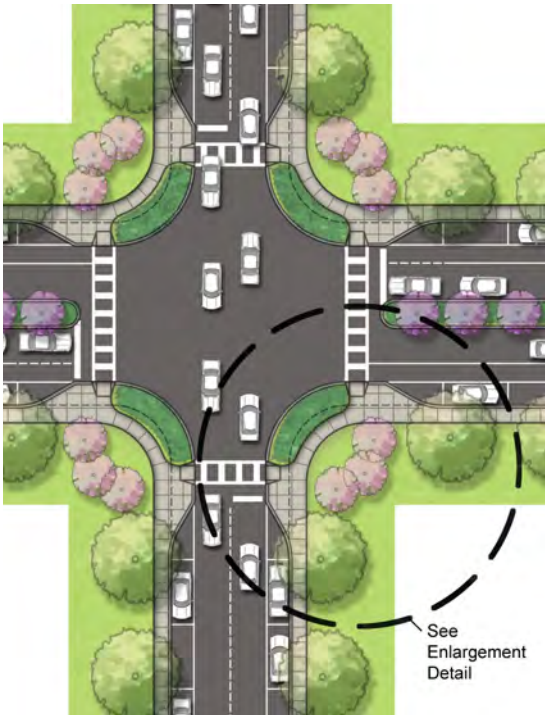


Figure 7.9.12. Site plan of choker traffic calming device.

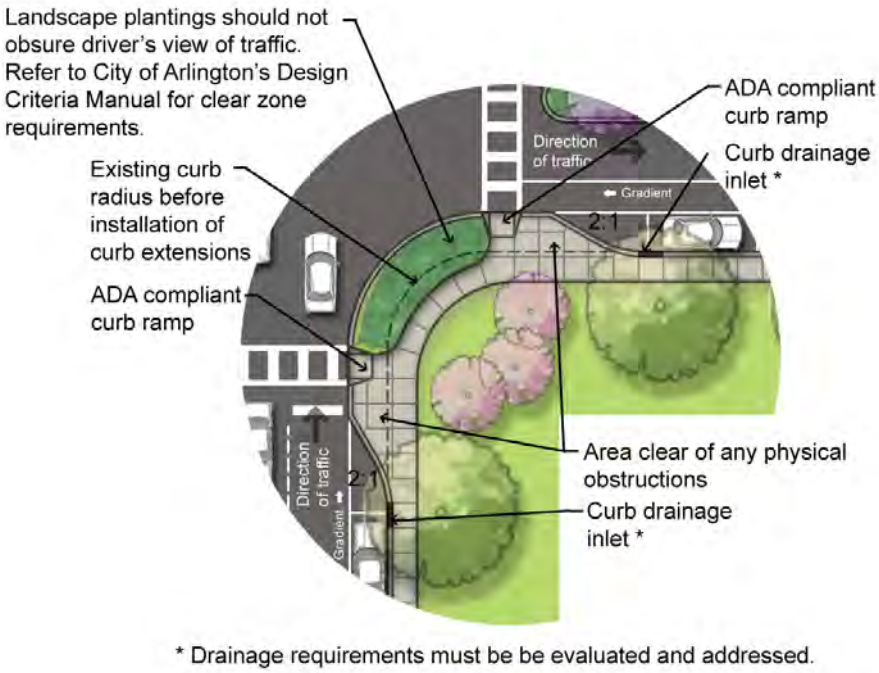


Figure 7.9.13. Choker enlargement detail.

E. Raised Crosswalks

Raised crosswalks are applicable for busy streets with multiple lanes. They are similar to speed tables and typically wider than a speed humps. Raised crosswalks are appropriate at some intersections, mid-block crossings, and drop-off and pick-up zones for high pedestrian traffic generators, such as schools, parks, libraries, and airports. Raised crosswalks are typically marked with high visibility pavement markings, signage, lights, and may be surfaced with special pavement material. Raised crosswalks can directly reduce motorist speeds and increase the occurrence of motorists yielding to crossing pedestrians. Marked crosswalks on both sides of a street allow for better visibility of crossing pedestrian zones by motorists (Figures 7.9.14 and 7.9.15).

Design Criteria:

- Surface should be smooth and a different paving and color than the road to enhance pedestrian safety and visibility.
- Pavers or pavement sections shall meet local, state, and federal load-bearing standards.
- To ensure crosswalk visibility, crosswalks must be marked with reflective lines; high visibility markings are best.
- Proper signage and pavement marking are required in advance of raised crosswalks.
- Refer to the City of Arlington Design Criteria Manual for Crosswalk Standards.
- Evaluate storm drainage and utility locations prior to design and installation of raised median or crosswalks.
- Paving materials are important to the function and look of a street, both in the road and on the sidewalk. Occasionally, paving materials in and of themselves act as a traffic-calming device (e.g., when the street is paved in brick or cobblestone). These materials are however noisy and unfriendly to bicyclists, pedestrians, or wheelchairs. In particular, cobblestone should not be used in the expected bicycle path, although they may be used as aesthetic elements in a streetscape design. Smooth travel surfaces are best for all pedestrians.
- Utilize a concrete paver or natural stone paver with sufficient load-bearing strength.

Figure 7.9.14. Perspective sketch of raised median/ crosswalk.

Figure 7.9.15. Example of raised crosswalks.,

F. Colored Bike Lanes

Colored bike lanes are an effective method to provide greater visibility and alert motorists of bicyclists on a busy road. Provide colored pavement for bike lanes where there is a higher probability of conflict. They are used to guide bicyclists through major vehicle/bicycle conflict points, especially at locations where the volume of conflicting vehicle traffic is high and where the vehicle/bicycle conflict area is long. Examples of such locations include freeway on and off ramps, where motorists move into a right turn pocket. In the United States, cities such as Portland and Seattle have experimented with colored bike lanes and supportive signage favorably (Figures 7.9.16 to 7.9.18).

Design Criteria:

- Provide colored concrete, colored seal coat, or colored dyes that can be incorporated in concrete and/or asphalt to provide colored pavement markings.
- For bike lanes use the color green; blue pavement markings are reserved for handicap uses.
- Colored bike lanes to be used at critical points of conflict between motorists and bicycle users.
- Colored bike lanes must be restored after construction with the same preconstruction color and treatment type.

Figure 7.9.17. Example of colored bike lanes.

- Painting or colored additives applied to the pavement material are preferred over thermoplastic striping to reduce slick surface.
- When possible, minimize points of bicyclist and vehicular conflict.
- Use color pavement markings sparingly so that when they are used they have a greater impact.

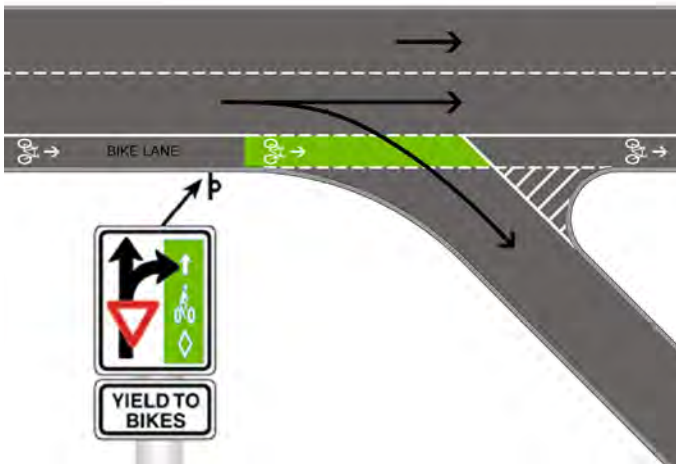


Figure 7.9.18 Colored bike lane at exit ramp/side street. (above)

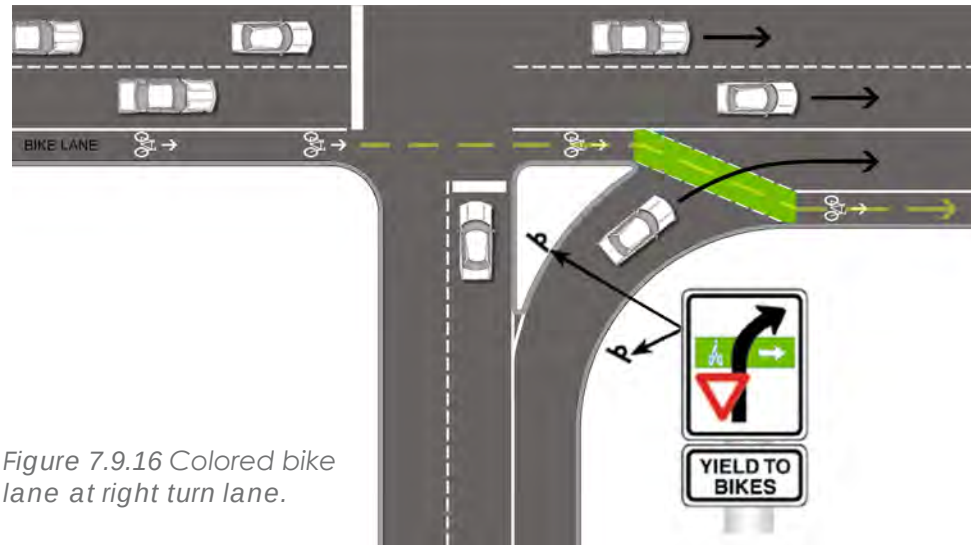


Figure 7.9.16 Colored bike lane at right turn lane.

G. Channelization

Channelization is often used to prevent cut-through traffic onto local streets or to control turning traffic in or out of a neighborhood. Channelization can also be used to reduce speed, create an opportunity for landscaping, control turning movement, direct/guide pedestrians, and to increase the safety of pedestrians and bicyclists. Channelization can be at street-level, provided there is a physical separation, or they can be elevated to create a separation from the roadway. The curb creates the separated space, as well as preventing passengers from opening doors into the cyclists' track and discouraging pedestrians from walking on the facility (Figures 7.9.19 to 7.9.21).

Design Criteria:

- Provide regulatory signage, pavement markings, landscaping, bollards, or raised islands to direct vehicular, bicyclist, and pedestrian traffic.
- Confirm proper warrants and public interest needs during the development of channelization recommendations.
- Signalization, pavement markings, and signage to comply with City of Arlington, MUTCD, AASHTO, and ADA standards.
- The major street must be wide enough to accommodate a 10-foot median.
- Provide treatment only along busy bicycle and pedestrian routes.

Figure 7.9.19. Example of channelization.

Figure 7.9.20. Example of channelization of intersection to prevent through movement.

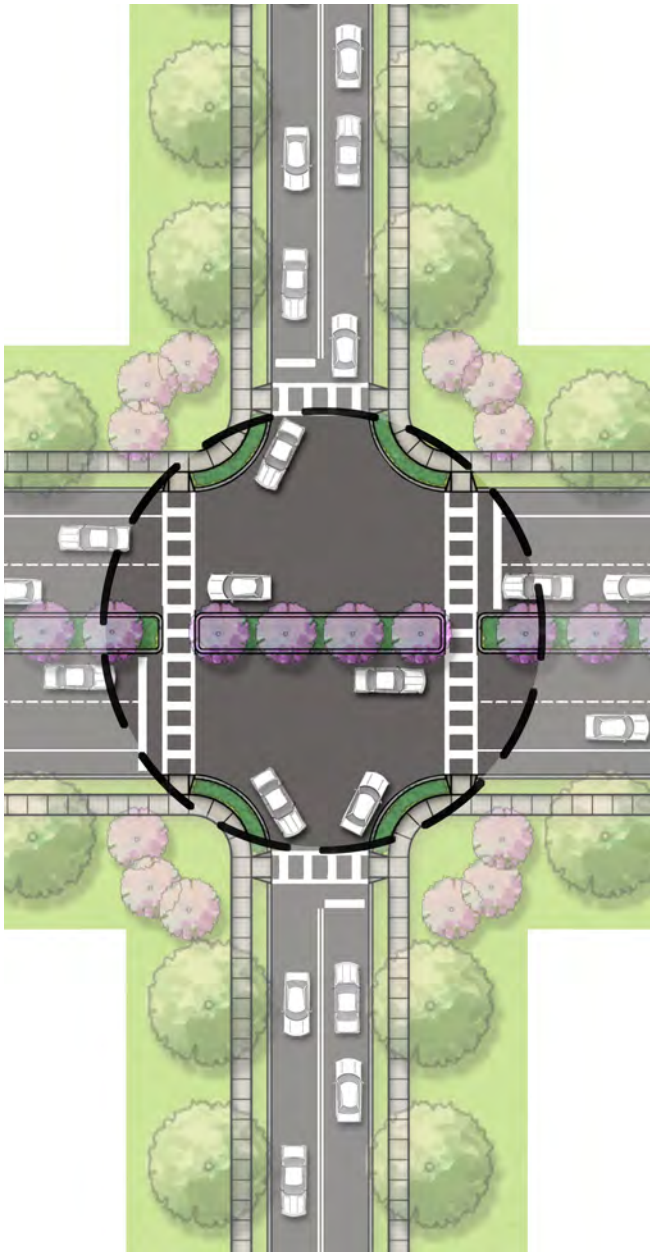


Figure 7.9.21. Site plan of channelization traffic calming device to prevent left turn movement.

H. Chicanes (Lane Diversion)

Another method to increase pedestrian and bicyclist safety is to employ chicanes or lane diversion along a street. Often this is done on local streets, but could be installed on major roads if engineering study results allow for this method to be installed. Shifting a travel lane has an effect on speeds, as long as the taper is not so gradual that motorists can maintain speeds. For traffic calming, the taper lengths should reflect the desired speed. Limits should be posted prior to the chicane. Chicanes create a horizontal diversion of traffic and can be gentler or more restrictive, depending on the design (Figures 7.9.22 through 7.9.27).

Design Criteria:

- Provide curb extension to alter direction of traffic movement, thus reducing speed.
- Reduce posted design speeds to accommodate chicanes.
- Shift traffic alternately from side to side of the street to create an S-shaped path of travel (Figure 7.9.22).
- Spacing of chicane segments depend on site considerations, driveway locations, grades of the road (Figure 7.9.23).
- Bicycles can use the same path as motor vehicles (Figure 7.9.26).
- When bicycles and motor vehicles use the same lane, properly sign lane as a shared path.
- Landscape plantings and islands should not obscure the driver's view of traffic.
- Refer to AASHTO and City of Arlington's Design Criteria Manual and Thoroughfare Development Plan for sight distance, centerline criteria, clear zones criteria, and minimum lane width standards.
- Shift on-street parking to opposite side of the street after the S-shaped path of travel (Figure 7.9.24).
- Build landscaped islands (islands can also effectively supplement the parking shift) (Figure 7.9.27).
- Refrain from installing chicanes on slopes greater than 5%.

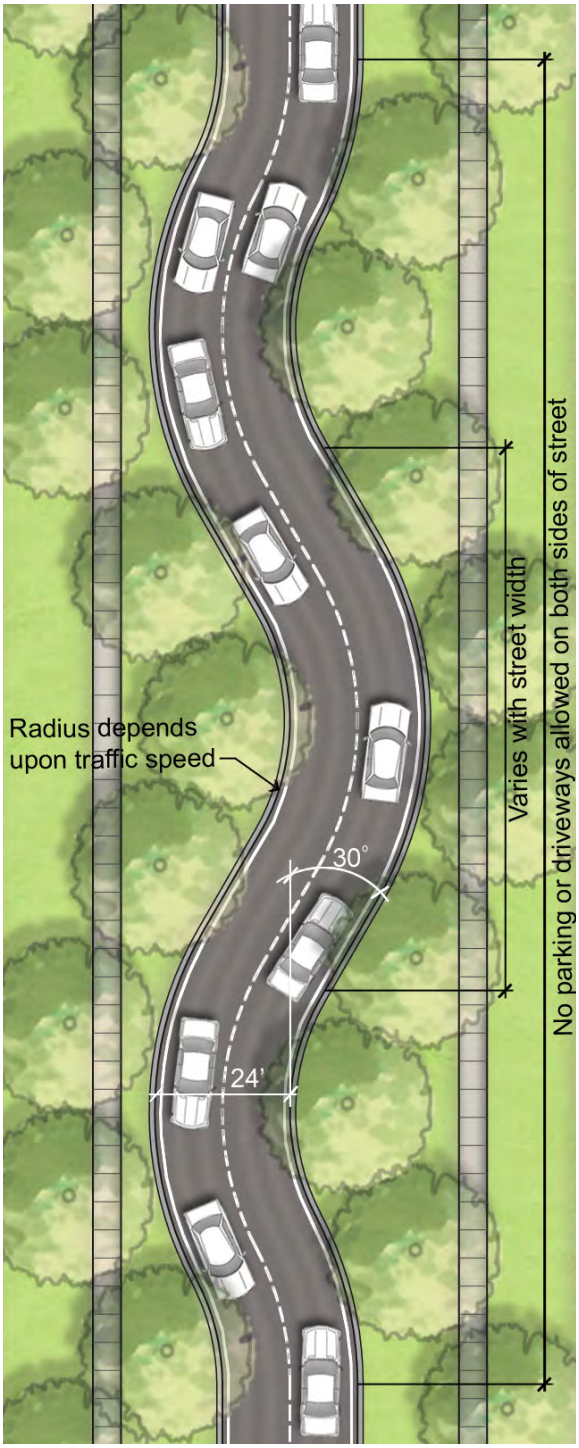


Figure 7.9.22. Site plan of chicane for new installations.

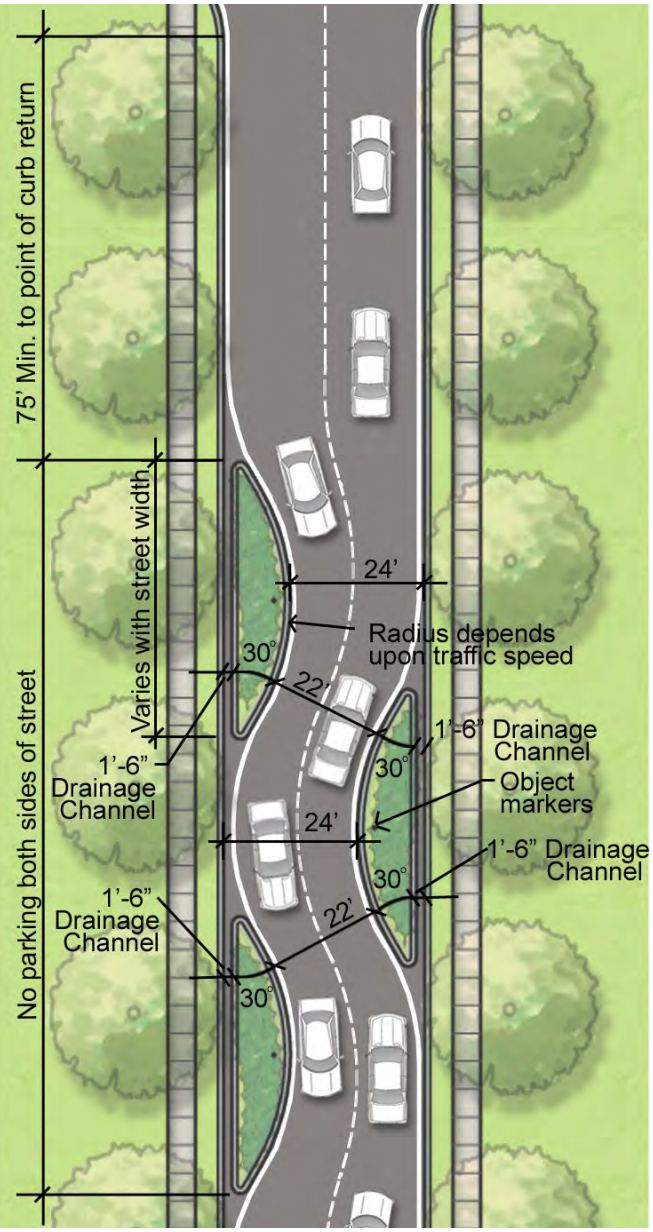


Figure 7.9.23. Site plan of chicane for retrofit installations.

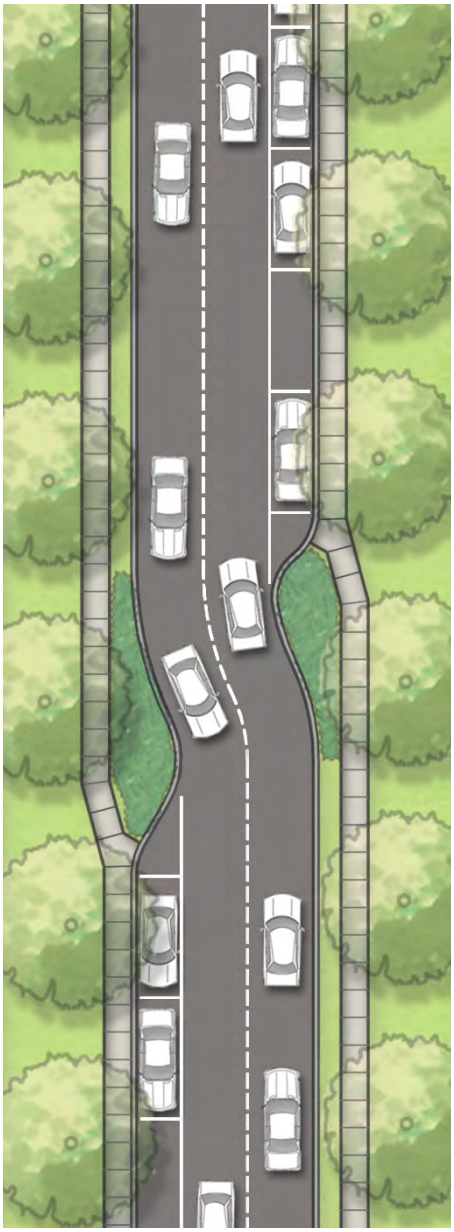


Figure 7.9.24. Site plan of chicane created through alternate parking.

Figure 7.9.25. Spacing of chicane segments depends on existing site conditions.

Figure 7.9.26. Bicyclist flow through the same path as motorists.

Figure 7.9.27. Built islands to help create parking opportunities.

I. On-Street Parking

On-street parking creates the perception of a narrow street, especially if parking occurs on both sides. On street parking also buffers pedestrians from vehicle traffic. Additional space should be provided for the nearest travel lane to the parking to prevent conflict with bicyclists and doors from parked vehicles (Figure 7.9.28).

Design Criteria:

- Refer to City Arlington Development Standards for angled and parallel parking design standards.
- Provide a minimum 4 foot wide door zone adjacent to the bike lane, if parallel parking is provided.
- Provide bulb extensions at intersection to allow visibility of pedestrians by motorists.
- Require adequate signage and lighting to increase visibility of pedestrians and bicyclists.
- Provide appropriate pavement signage and markings to identify use of bike lanes, door zone, and parallel parking.
- Provide adequate lane width for large vehicle turning movements.
- Landscape plantings should not obscure the driver's view of traffic. Refer to the City of Arlington's Design Criteria Manual for clear zone requirements.

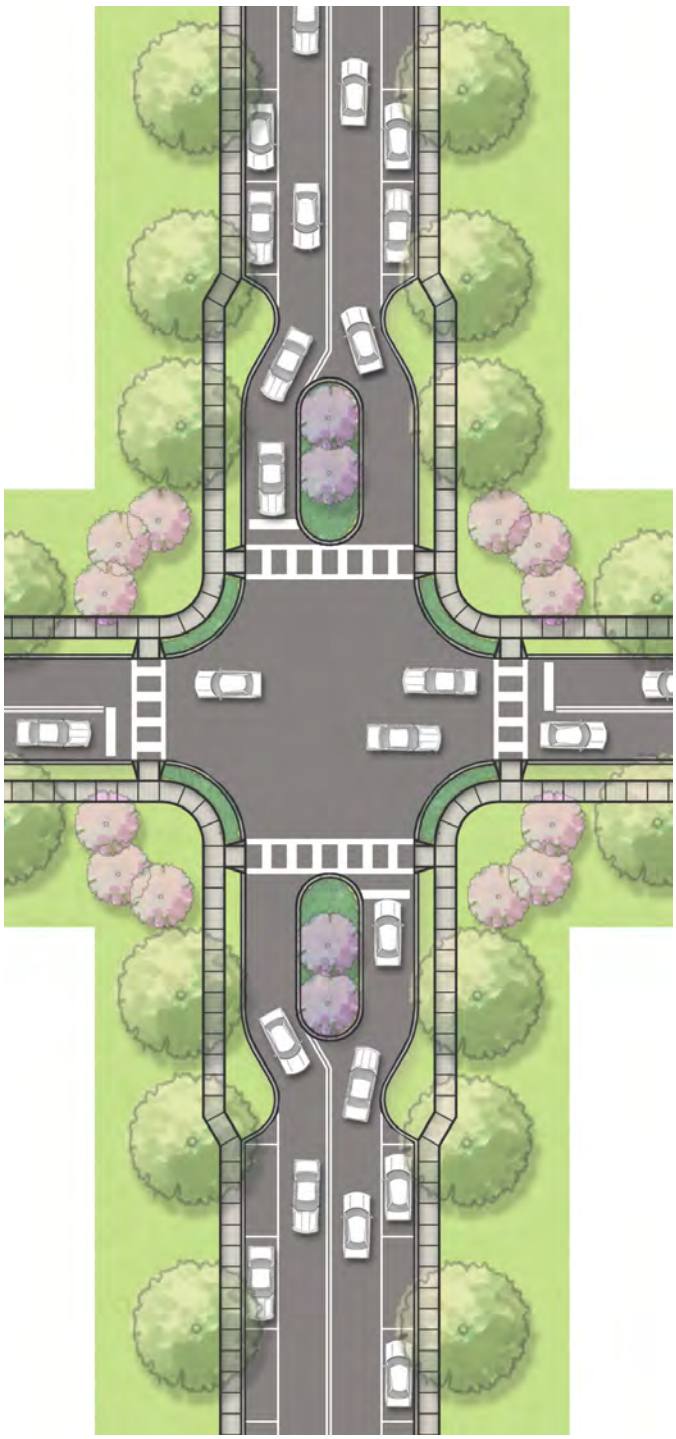


Figure 7.9.28. On-street parking slows down traffic.

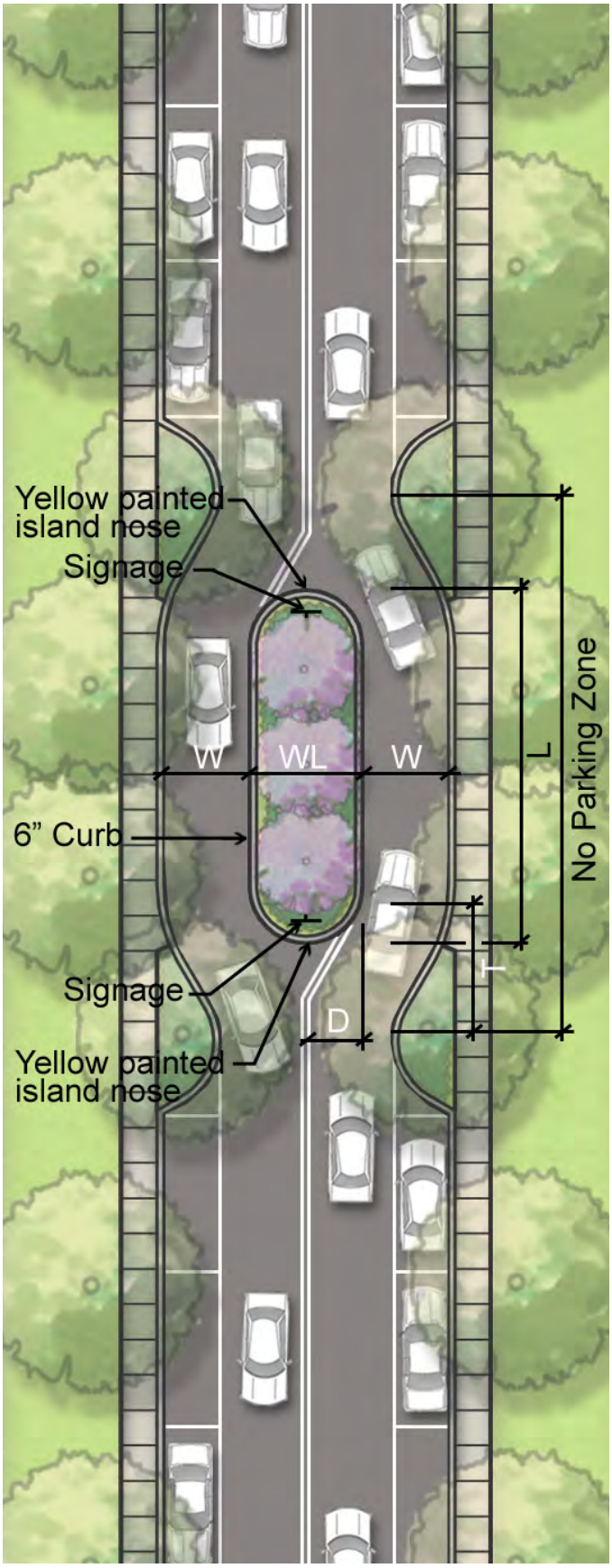


Figure 7.11.29. Site plan of mid block median slow down traffic calming device.

J. Median Slow Down

Center medians or islands that narrow a road are often landscaped to provide a visual and physical amenity. Center medians or islands are placed at entrances into neighborhoods or at a mid block crossing, combined with textured pavement and landscape improvements, to help slow down traffic and create a gateway for the neighborhood (Figures 7.9.29 and 7.9.30).

Figure 7.11.30. Example of mid block median slow down through neighborhood street.

Legend

W - Travel lane width = 14'-0"

WL - Width of slow point/median (varies depending on street width, 12' minimum)

L - Length of slow point, varies depending on parking and driveways

D - Horizontal deflection, 6' minimum

T - Transition, calculated as follows:
T = (D x S<2) / 120 - minimum
Where: D=deflection in feet
S = 85th percentile speed in mph

Note:
Median landscape planting should not obscure driver's view. Refer to City of Arlington's Design Criteria Manual for clear zone requirements.

Design Criteria:

- Reduce speed limits.
- Provide signing and markings in accordance with City of Arlington, AASHTO, and MUTCD standards.
- Refer to the City of Arlington's Thoroughfare Development Plan for minimum lane widths.
- Confirm drainage pattern and adjusts structures as needed.

K. Restricted Turn Only

Restricted turn only or half closures are barriers that block travel in one direction for a short distance on an otherwise two-way street. It may also limit two-way traffic to one directional traffic flow. Restrictive turn only improvements avoid extreme traffic volume problems and limited conflicts between motorist, pedestrian, and bicyclist, while maintaining local neighborhood access. A half closure integrates elements of a forced turn island by directing all vehicles to turn left or right and changes a street into a one way street with on-street parking (Figure 7.9.31).

Design Criteria:

- Reduce speed at intersections and along corridors.
- Provide proper signing and markings in accordance to the City of Arlington, AASHTO, and MUTCD design standards.
- Refer to the City of Arlington Thoroughfare Development Plan for minimum lane requirements.
- Provide traffic plan to determine if restricted movement may have effect in other nearby streets.

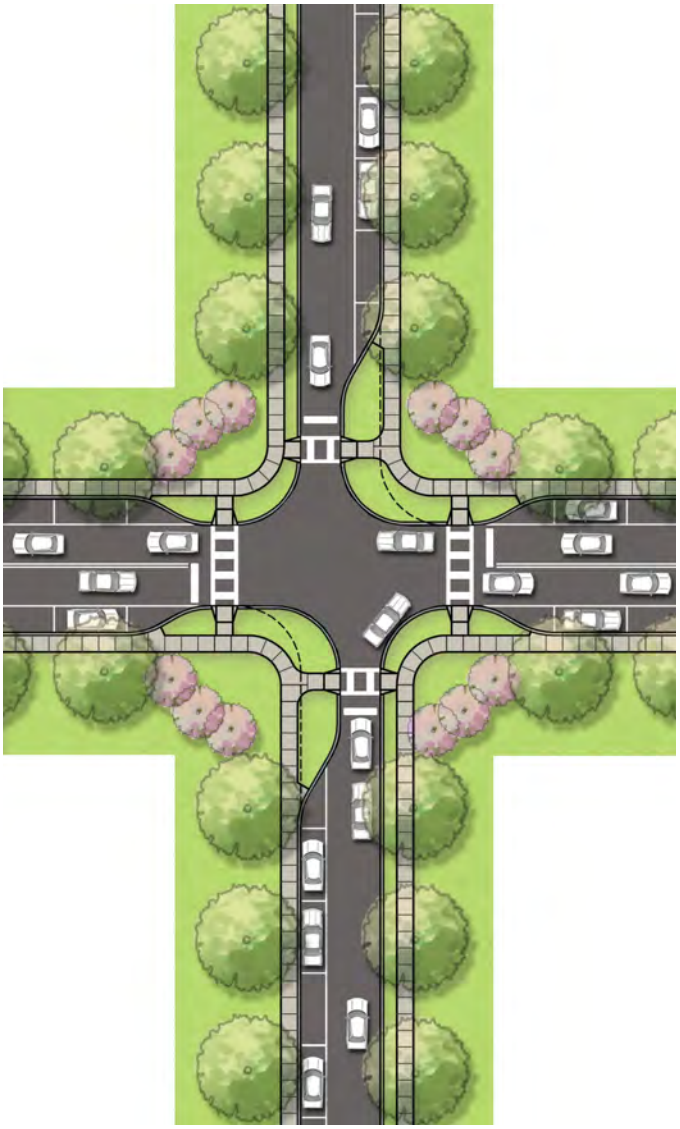


Figure 7.9.31. Site plan of restricted right turn only traffic calming device.

7.10 BIKEWAY & WALKWAY MAINTENANCE

The issues of proper maintenance and security should be addresses during the planning and design phases of the project as well as at the completion of the construction. Bikeways and walkways should be constructed only if adequate budgets for maintenance and security can be provided. Maintenance is essential to the safety of the trail user as well as extending the useful life of the project. Items for consideration include scheduling and documentation of inspections with regard to the condition of railings, bridges, trail surfaces, proper and adequate signage, removal of debris, and coordination with all agencies that maybe associated with trail maintenance. Maintenance is dependent upon a variety of development and use factors and therefore, each type of bikeway and walkway should have a maintenance program established for that specific type of improvement.

A maintenance program should plan, prioritize, schedule, and track maintenance work by:

1. Identifying specific maintenance goals and standards which will provide a consistent level of service.
2. Developing the necessary maintenance programs specific to the facility types.
3. Executing the maintenance programs by using the most efficient resources.
4. Conducting an ongoing evaluation the effectiveness of the maintenance program.
5. Developing cost data from which future budgets can be built.

Identify Project Areas

The first step in implementing a maintenance system plan is to determine the bikeway and walkway routes. An inventory of the physical features on or adjacent to the bikeways and walkways and the total mileage of each type of improvement should be prepared. The inventory should be updated when features are added, modified, replaced, or removed. An inventory is critical in preparing the maintenance budget and in determining the total dollar amount needed to fully maintain the bikeway and walkway system. By comparing the needed funds to available funds, a long range maintenance plan can be developed. If kept current, maintenance logs may be used to prepare documentation for contract packages, and will show the location of structures and other features which require maintenance.

Identify Maintenance Priorities

The assigning of maintenance level priorities to the hike and bike system is based on criteria such as amount of use, potential to affect resources, safety considerations, etc. Once maintenance priorities are established, they should be reviewed and updated annually. When assigning maintenance levels, give higher priority to bicycle and trail facilities where use is significant. Traffic counters to collect and record traffic volume data can be used to determine facilities that receive the most use. This data collection should proceed on a continuing basis to provide necessary information for planning, developing, monitoring, and confirming maintenance levels.

Identify Maintenance Activities

Determine what maintenance activities will be tracked and the necessary steps that are required. Activities may be tracked by a broad category such as by maintenance, which would lump all the specific work activities and specific costs for these activities (such as cleaning, rebuilding or replacing, etc.) under one broad activity. Specific activities may be tracked to aid in the preparation of contract estimates or to compare in-house costs to contract costs for certain activities. Condition surveys can also be performed in locations where higher maintenance needs are anticipated, such as areas that have significant traffic, steep grades, bad soils, drainage problems, etc. Special emphasis should be given to these types of locations.

Identify Maintenance Standards

Maintenance standards should be established to document work requirements to meet the acceptable physical standard, or the acceptable end product for a maintenance level, or for a particular activity. The maintenance standard is met when all the work activities listed on the standard are completed.

Identify Maintenance Program

A "maintenance program" is written to show the work that is required to bring the bike or trail to a standard level and will include the associated cost. The maintenance needs identified in the prescription should be prioritized and used in the development of the annual maintenance plan.

Developing Maintenance Plans

The following describes an optional method for preparation of a maintenance plan.

a. The person responsible for maintenance determines the following for each facility:

(1) A maintenance level,
(2) A base maintenance year, and
(3) A maintenance frequency based on the expected trail use.

After all information is collected, combine the individual plans to see if the annual maintenance plans for maintenance period relates to the expected annual funding, and to assure that the movement of personnel and equipment from one facility to another is reasonable. Adjust the plan as necessary; the resulting report will be the proposed maintenance plan.

b. An annual maintenance plan may be developed from the long range maintenance plan by generating a list of the bikeways and walkways to be maintained in any given year.

c. Prepare a maintenance work plan for the approaching season. Various formats for the maintenance plan may be developed. At a minimum, the plan must identify cost estimates, funding sources, and the party responsible for performing the work on the trails.

d. Use the annual maintenance plan to estimate costs for the required work and determine the funding needs for the next budget period.

Deferred Maintenance Plan

Develop a plan for the accomplishment of deferred maintenance. The plan should indicate the items of deferred maintenance, the estimated cost of the work, and the anticipated year of accomplishment. The plan should be balanced, so as to accomplish a percentage of the deferred maintenance annually.

Scheduling

Document the work that will be performed within the season. Documentation of work schedules is important (1) to ensure that high priority work is accomplished first, (2) to determine if all required work is being accomplished on time and (3) to provide a documented history of maintenance scheduling for future maintenance managers.

A. Maintenance to be performed on a regular basis:

1. Bikeway and walkway inspection

Inspections are integral to all bikeway and walkway maintenance operations. Inspections should occur on a regularly scheduled basis, the frequency of which will depend on the amount of use, location, age, and the type of construction. All inspections are to be documented.

2. Leaf and Debris removal

Keeping the bikeway and walkway surfaces clean is one of the most important aspects of facility maintenance. Mud and other sediment shall be removed along with fallen leaves and branches to ensure the safety of the users and increase the life expectancy of the facilities. Areas that require sweeping of the whole system shall be swept by machine. Bikeways or walkways that require only spot sweeping of bad areas will be cleaned with blowers. Some locations will require a combination of methods. Broken glass and small stones are not only unsafe for bicyclists or pedestrians, but the debris can also cause damage to tires and serious injury. Regular maintenance of bikeways and walkways shall be required on a set schedule to improve the safety of its users.

3. Trash removal

Trash removal from trail corridors is important from both a safety and an aesthetic viewpoint. Trash removal includes removing ground debris and emptying trash containers. Trash removal

will take place on a regularly scheduled basis, the frequency of which will depend on trail use and location.

4. Tree and brushing pruning

Tree and brush pruning will be performed for the safety of bikeway and walkway users. Pruning will be performed to established specifications on a scheduled and as needed basis.

- Maintain minimum vertical clearance along bikeways and sidewalks. Low vegetation can encroach on the bicyclist and pedestrian zones, and can be a nuisance and safety concern.
- Vegetation can obscure visibility of motorists at intersections.
- Vegetation can prevent road signage from being visible and reduces illumination of an area, especially at night.
- Tree roots can make uneven pavement surface. Prune and control tree roots to prevent uneven surfaces.
- Trim vegetation to prevent encroachment and to maintain a clear zone at intersections.

5. Mowing of vegetation

Bikeway and walkway maintenance personnel should mow vegetation along trail corridors on a determined schedule. Brush and grasses should not be allowed to grow to excessive heights along the edges of bikeways and walkways.

6. Scheduling maintenance tasks

Inspections and repair of bikeway and walkway related maintenance concerns will be regularly scheduled. Inspection and repair priorities should be dictated by use, location, and design. Scheduling maintenance tasks key towards the goal of consistently clean and safe trails.

B. Maintenance to be performed on an irregular or as needed basis:

1. Roadway Repairs and Maintenance

Roadway surfaces may be adequate for automobiles, but may often not be safe for bicycles and pedestrians. Poor pavement drainage, pavement failures, and debris are some examples of road hazards for bicyclists and pedestrians. Roadway pavement surfaces should be repaired, to maintain pedestrian and bicyclist safety. Pave street over the entire roadway surface to avoid any abrupt road edge (Figure 7.10.1).

2. Bikeway and Walkway Repair

Repair of asphalt or concrete on bikeways and walkways shall be closely tied to the inspection schedule. Prioritization of repairs is part of the process. The time between observation and repair of a trail will depend on whether the needed repair is deemed a hazard and to what degree the needed repair will affect the safety of the user. It also depends on whether the needed repair can be performed by the trails maintenance crew or if it is so extensive that it needs to be repaired by outside entities.

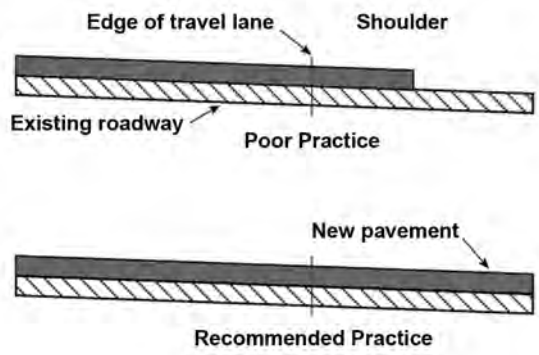


Figure 7.10.1. Example of on-road repaving at bike lane or shoulder.

3. Bikeway and Walkway Replacement

The decision to replace a bikeway or walkway and the type of replacement depends on many factors, such as the age of the facility and the money available for replacement. Replacement involves either completely overlaying an asphalt trail with a new asphalt surface, or replacement of an asphalt trail with a concrete trail. In general, replacing asphalt with concrete is desirable.

4. Bikeway and Walkway Signage and Markings

Bikeway and walkway signs fall into two categories: safety and information. Trail users should be informed where they are, where they are going, and how to use the facilities safely. Signs related to safety are most important and should be considered priority and shall be maintained. Informational signage can enhance the users' experience. Inspection of bikeway and walkway safety and information signs and other pavement markings is critical. Signage should be visible at all times for all users. Horizontal signs and pavement markings on the street should be visible and the appropriate color reflectivity should be used. Replace defective signs and pavement markings on an as needed basis.

5. Weed control

Weed control along Bikeways and walkways will be limited to areas in which certain weeds create a hazard to users. Environmentally safe weed removal methods should be used, especially along waterways.

6. Edging

Edging maintains bikeway and walkway widths, and improves drainage. Problem areas include trail edges where berms tend to build up and where uphill slopes erode onto the trails. Removal of this material will allow proper draining, allow the flowing action of the water to clean the trail, and limit standing water.

7. Drainage control

A culvert often becomes clogged with trash and debris and must be cleaned to prevent flooding and undercutting of pavement surfaces. In places where low spots on the bikeway or walkway catch water, the pavement surface should be raised or drains should be considered to carry away water. Drainage control can also be achieved through the proper edging of trails. If drainage is corrected near steep slopes, the possibility of erosion must be considered. Drainage structures shall be flush with pavement surfaces or adjusted as needed to prevent damage and harm to pedestrians and bicyclist and to maintain proper drainage.

8. Maintenance of water crossings

Water crossings can be bridges, boardwalks or open box culverts. Debris needs to be removed on an as needed basis from the structures to allow the free flow of water and to reduce the risk of flooding. These structures need to be inspected on a regular basis for erosion control and action taken accordingly to preserve or replace structures.

9. Revegetation

Areas adjacent to bikeways and walkways that have been disturbed for any reason should be revegetated to minimize future erosion concerns.

10. Habitat enhancement and control

Habitat enhancement is achieved by planting vegetation along trails, mainly trees and shrubs. This can improve the aesthetics of the trail, help prevent erosion, and provide for wildlife habitat. Habitat control involves mitigation of damage caused by wildlife. An example is the protection of trees along waterways from damage caused by beavers.

11. Coordination with other agencies

Maintenance of bikeways and walkways can often be located within more than one jurisdiction. A clear understanding of maintenance responsibilities needs to be established to avoid duplicating efforts or missing maintenance on the sections of the facilities.

12. Graffiti control

The key to graffiti control is prompt observation and removal. During scheduled trail inspections any graffiti should be noted and the graffiti removal crew promptly notified. Vandalism left unattended encourages more of the same activity and should be a high priority of maintenance.

13. Law enforcement

Law-enforcement effort is critical towards the goal of a safe bikeway and walkway system. Law enforcement agencies should be aware of the location of facilities, and the types and lev-

els of use they receive. Increased law enforcement awareness shall be addressed on an as needed basis.

14. Proper training of employees

Properly maintenance training for employees is essential to the efficient operation of the bikeway and walkway maintenance program. All employees should be thoroughly trained to understand and be aware of all of the above-mentioned aspects of the bikeway and walkway maintenance. Safety, a good work ethic, and proper care of equipment and tools will always be the backbone of a good training program. Employees must also be aware of the need for positive public contact. Proper positive attitude towards public questions and concerns is important, as is the conveyance of this information to supervisors.

15. Record Keeping

Good record-keeping techniques are essential to an organized program. Accurate logs should be kept on items such as daily activities, hazards found, action taken, and maintenance needed and performed, etc. Records can also include surveys of the types and frequency of use of certain bikeway and walkway sections. This information can be used to prioritize facility management needs.

C. Operating During Construction

Bicyclists and pedestrians have greater exposure to the noise, dirt, and fumes in a construction zone due to their slower speed than motor vehicles. Temporary lane restrictions, detours, and other traffic control measures should be designed to accommodate these users. If these measures are not possible, access should be denied. Appropriate traffic control measures can provide safe and convenient passage for pedestrians and bicyclists during roadway construction (Figures 7.10.2 and 7.10.3).

- A passage should be created that allows pedestrians and bicyclists to proceed as close to their normal route as possible.
- Barricades and cones can be used to create a passageway, if a sidewalk is closed.
- Temporary passageways must be accessible by all ages and abilities.
- Keep crosswalks open at all intersections and temporary crosswalks must be painted.
- If temporary signal is required, pedestrian phases must be included.
- Bicyclists can share a lane with pedestrians for a short period of time if there is lack of additional passageway. For longer distances, a separate passageway for bicyclists must be maintained.
- Bicyclists should not be routed onto a sidewalk or unpaved shoulder.
- Passageways for bicyclists and pedestrians should be clear of debris.
- Placement of temporary signs should not obstruct movement of pedestrians and bicyclists.

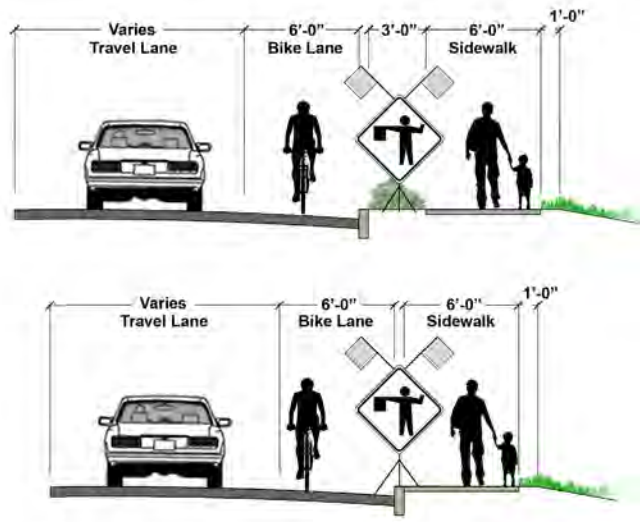


Figure 7.10.2. Section of construction sign placement

Figure 7.10.3. Provide the proper security measures during the construction process to ensure safe ingress and egress for businesses.

A. PUBLIC INPUT

Appendix Contents:

Overview

Citizen and Staff-based Steering Committee

Public Workshops

Comment Form

Overview

In order to gain local knowledge and input, a public outreach component was included as an integral part of planning efforts for the Arlington Hike and Bike System Master Plan. Public input was gathered through several different means including the following: Steering Committee meetings, three public workshops, newsletters, local advocacy group outreach, various town hall and community meetings and public on-line comment forms. This offered the representatives and citizens of Arlington opportunity to contribute to the Plan's development.

Citizen and Staff-based Steering Committee

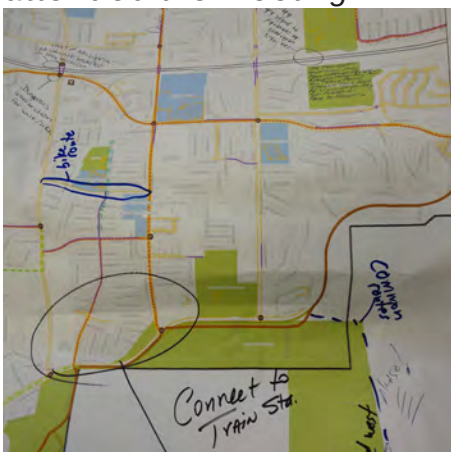
The Steering Committee (composed of citizens, City staff, NCTCOG, local advocates, and UT-Arlington), met four times during the planning process. The group established visions and goals for the Plan and identified areas of need for walking and bicycling in Arlington. Members of the Committee marked-up maps and identified bicycle and pedestrian problem areas and possible solutions. The committee goals are listed in Chapter 1 and input from the Committee is reflected throughout the recommendations of this planning document.

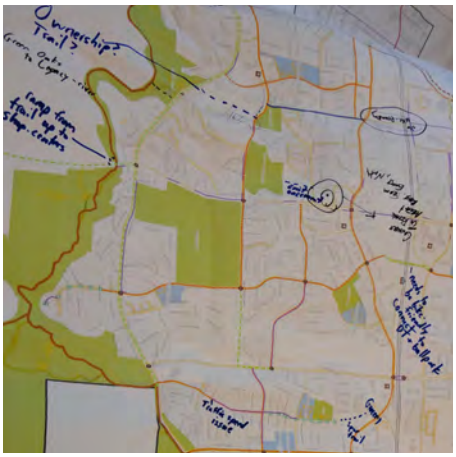
The Steering Committee also provided comments on the Draft Plan. These comments led to revisions made by the consultant in the development of the Final Plan.

Right: Images from committee meetings.

Public Workshops

Three public input workshops were conducted during the planning process. The first opportunity was held at Arlington City Hall in January 2010. A rolling presentation was given to this committee and the general public. This initial public input session sought to gather preliminary input from citizens to assist in the development of draft recommendations for the Plan. *Approximately 255 citizens attended the meeting.*



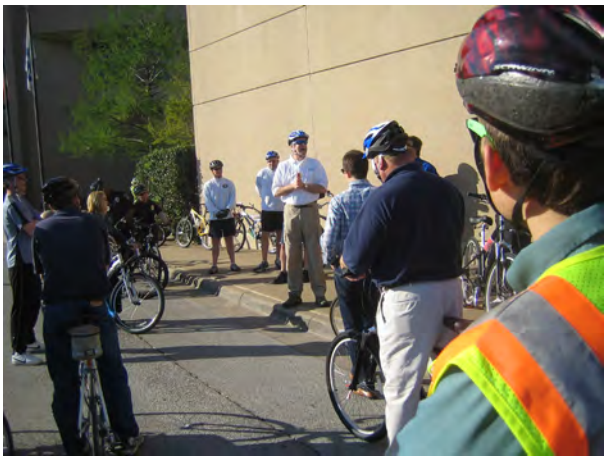


Examples of marked-up maps from pubic workshops, an image from a workshop, and workshop flyer.

The second public workshop was held in April 2010 and presented draft recommendations and solicited public comment again at Arlington City Hall. Preliminary recommendations were presented in map form at this meeting. Citizens responded to these draft recommendations by providing feedback and discussing the proposed hike and bike facilities. *Approximately 110 citizens attended this meeting.*

In addition, a staff bike ride was held in April 2010. City Council members, City staff, City Police, Steering Committee members, project consultants, and Bicycles Inc. took part in a morning ride around the Downtown area. Approximately 30 riders took part in the event raising awareness. Biking techniques were taught as well.

April 2010 City Council Bike Ride



Finally, the third public workshop was held at the Bob Duncan Center in September 2010, with over 100 citizens in attendance. Final Draft Plan recommendations were presented along with information regarding the next steps of implementation.

At all workshop sessions, public input was taken in the form of map markups, written comments, question and answer sessions, and through discussions between citizens, consultant staff from Greenways Incorporated and City staff. In addition, a hardcopy public comment form was developed and distributed for hand

written responses during each meeting.

Comment Form

A comment form was developed for Arlington during this process and made available in both hardcopy and online format. The comment form was available online for nearly six months. To maximize the responses to the online form, the web address was distributed at the public meetings, to local interest groups, in newsletters, and on flyers throughout the City. Approximately 458 persons completed the comment form.

The comment form results shown on the following pages have been tabulated by Greenways Incorporated to provide insight into local residents' opinions and values.

1. How do you rate present pedestrian conditions in the Arlington area? (select one)

	Response Percent	Response Count
Excellent	3.3%	15
Fair	43.6%	197
Poor	**53.1%**	**240**
	answered question	**452**
	skipped question	**6**

2. How do you rate present bicycling conditions in the Arlington area? (select one)

	Response Percent	Response Count
Excellent	2.0%	9
Fair	29.1%	132
Poor	**68.9%**	**312**
	answered question	**453**
	skipped question	**5**

3. How important to you is improving walking and biking conditions in the Arlington area? (select one)

	Response Percent	Response Count
Very important	**90.5%**	**412**
Somewhat important	9.0%	41
Not important	0.4%	2
answered question		**455**
skipped question		**3**

4. How often do you walk now? (select one)

	Response Percent	Response Count
never	8.0%	36
few times per month	34.6%	155
few times per week	**35.3%**	**158**
5+ times per week	22.1%	99
answered question		**448**
skipped question		**10**

5. How often do you bike now? (select one)

	Response Percent	Response Count
never	20.0%	90
few times per month	**28.9%**	**130**
few times per week	28.0%	126
5+ times per week	23.1%	104
answered question		**450**
skipped question		**8**

6. Would you walk more often if more sidewalks, trails, and safe roadway crossings were provided for pedestrians?

	Response Percent	Response Count
Yes	**88.3%**	**393**
No	11.7%	52
answered question		**445**
skipped question		**13**

7. Would you bike more often if more bicycle lanes, trails, and safe roadway crossings were provided for bicyclists?

	Response Percent	Response Count
Yes	**93.9%**	**417**
No	6.1%	27
answered question		**444**
skipped question		**14**

8. Should public funds be used to improve hike and bike options and facilities?

	Response Percent	Response Count
Yes	**96.6%**	**429**
No	3.4%	15
answered question		**444**
skipped question		**14**

9. What types of funds should be used? (Choose all that apply)

	Response Percent	Response Count
Local foundation or nonprofit	69.2%	306
Capital improvements bond or other financing strategy	70.4%	311
Existing local taxes	68.6%	303
New local taxes	33.3%	147
State and federal grants	**84.6%**	**374**
Other (please specify)	10.6%	47
	answered question	**442**
	skipped question	**16**

10. For what purposes do you walk or bike most now and/or would you want to walk for in the future? Select all that apply.

	Response Percent	Response Count
Fitness or recreation	**95.0%**	**422**
Transportation to some destination	59.9%	266
Social visits	36.0%	160
Walking the dog	35.6%	158
Walking the baby / pushing a stroller	14.2%	63
	answered question	**444**
	skipped question	**14**

11. What walking and bicycling destinations would you most like to get to? Select all that apply.

	Response Percent	Response Count
Place of work	42.4%	188
School	28.9%	128
UT-Arlington	32.1%	142
Restaurants	46.3%	205
Public Transportation	34.3%	152
Shopping	44.5%	197
Parks	86.2%	382
Entertainment	38.1%	169
Trails and greenways	**89.2%**	**395**
Libraries or recreation centers	61.2%	271
	answered question	**443**
	skipped question	**15**

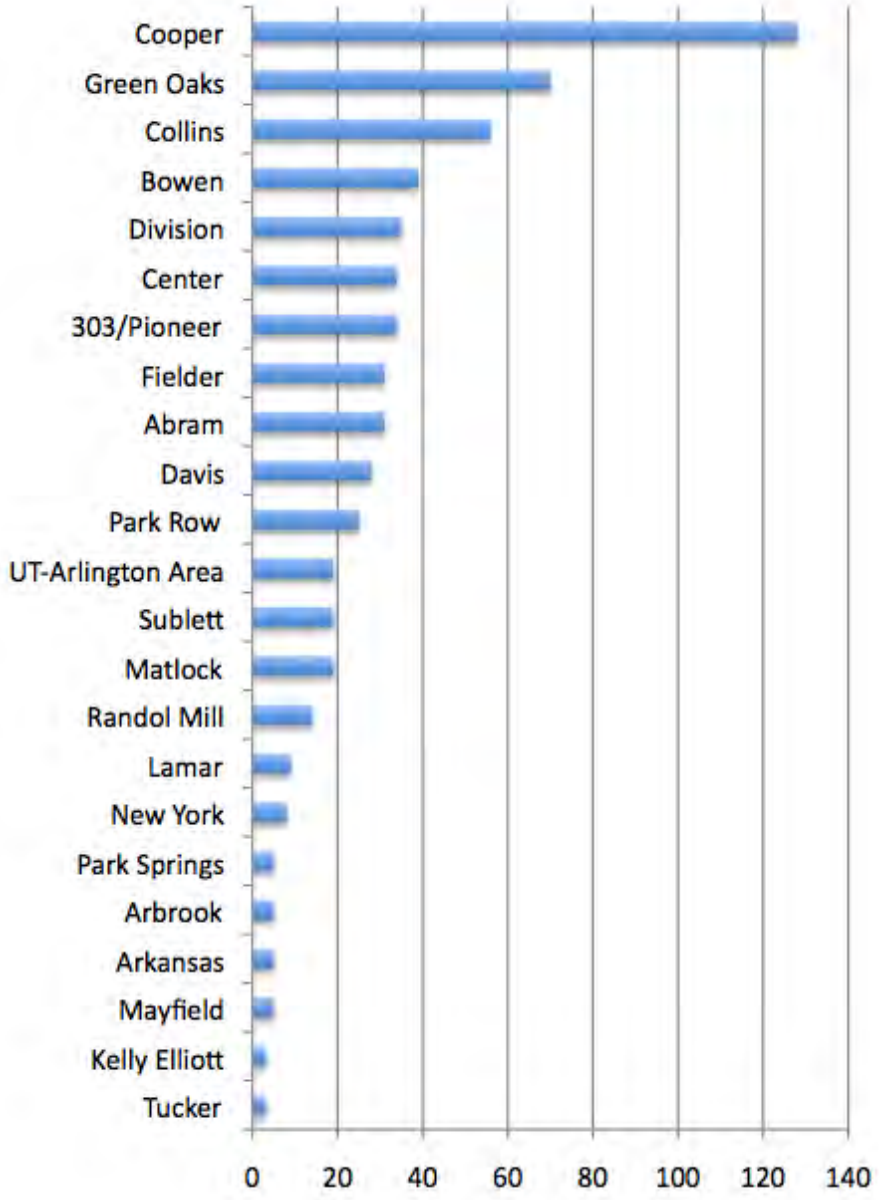
12. What factors discourage walking? Select all that apply.

	Response Percent	Response Count
Lack of sidewalks and trails	**86.1%**	**366**
Lack of crosswalks at traffic signals	36.9%	157
Lack of pedestrian signals at intersections	35.3%	150
Automobile traffic and speed	72.9%	310
Pedestrian unfriendly streets and land uses	72.9%	310
Lack of interest	6.8%	29
Lack of time	12.5%	53
Aggressive motorist behavior	57.4%	244
Sidewalks in need of repair	47.3%	201
Lack of nearby destinations	29.9%	127
Criminal activity	23.8%	101
Level of street lighting	32.0%	136
Lack of landscaping and/or buffer between sidewalks and road	40.9%	174
Other (please specify)		37
answered question		**425**
skipped question		**33**

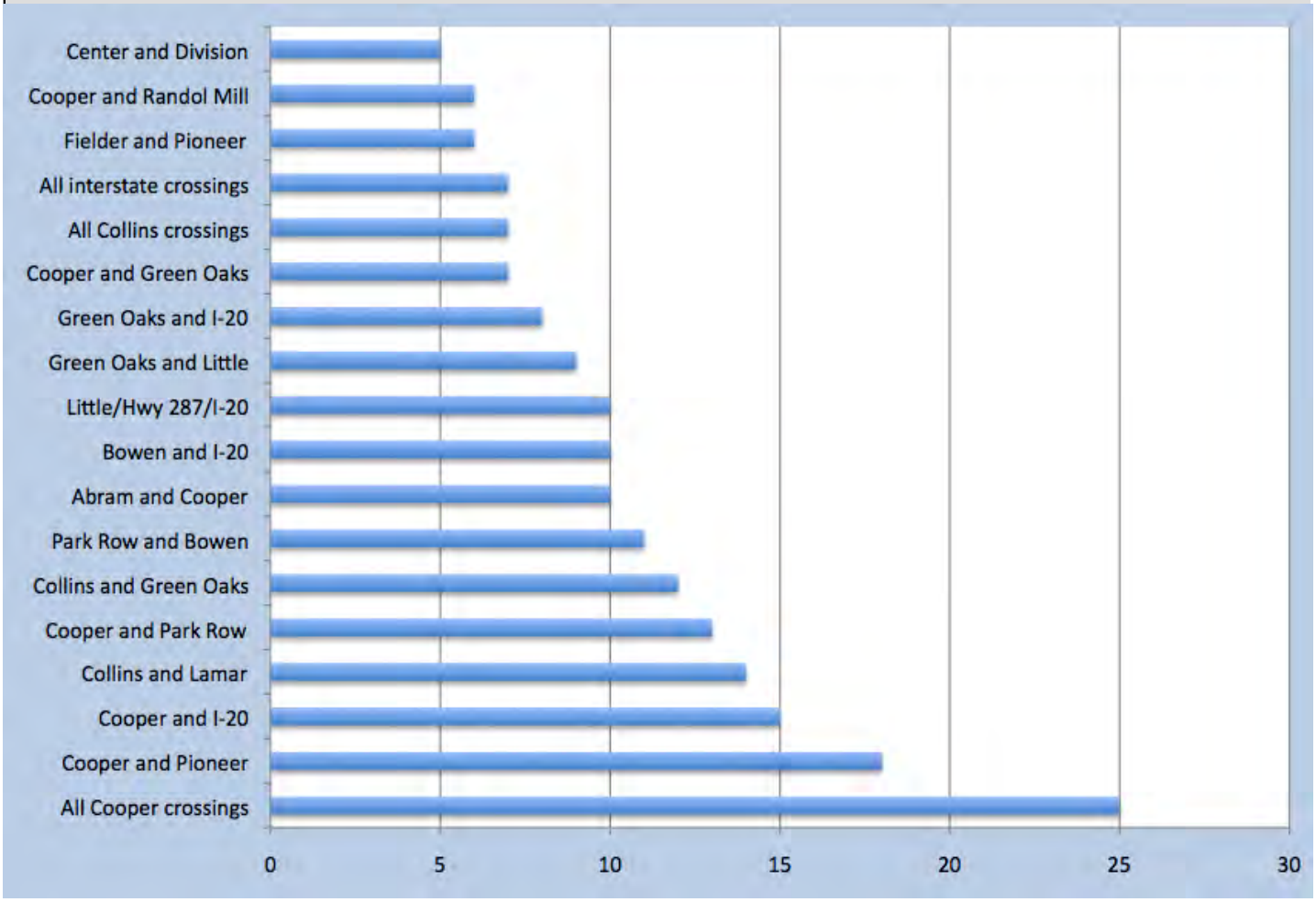
13. What factors discourage biking? Select all that apply.

	Response Percent	Response Count
Lack of bicycle lanes, shoulders, or paths	**92.2%**	**392**
Narrow lanes	68.5%	291
High-speed traffic	78.6%	334
Traffic volume	69.2%	294
Inconsiderate motorists	72.5%	308
Lack of bicycle parking	41.9%	178
Lack of showers and lockers at workplace	18.1%	77
Criminal activity	18.4%	78
Loose gravel or potholes	42.4%	180
Crossing busy roads	66.4%	282
Poor lighting	27.1%	115
Drainage grates	16.2%	69
Other travel modes are safer or more comfortable	17.9%	76
Hills	5.2%	22
Physical ability	6.4%	27
Travel time or distance	12.9%	55
Other (please specify)		44
answered question		**425**
skipped question		**33**

14. What do you think are the top roadway corridors most needing pedestrian and bicycle improvements?



15. What do you think are the top intersections most needing pedestrian and bicycle improvements? Example: Smith Ave. & Turner St.



16. What is your zip code?

(Majority inside Arlington)	**Response Count**
	412
answered question	**412**
skipped question	**46**

17. What is your gender?

	Response Percent	Response Count
M	**59.7%**	**255**
F	40.3%	172
	answered question	**427**
	skipped question	**31**

18. What is your age?

	Response Percent	Response Count
0-18	3.5%	15
19-25	7.7%	33
26-35	15.7%	67
36-45	**24.8%**	**106**
46-55	23.4%	100
56-65	17.1%	73
65 and older	7.9%	34
	answered question	**428**
	skipped question	**30**

19. Please provide your email address below if you would like to stay up to date with the Arlington Hike and Bike System Master Plan.

(Addresses kept private)	Response Count
	291
answered question	**291**
skipped question	**167**

Responses to question #20 (Do you have any further comments or ideas?)

My daughter was hit by a car because of no sidewalks and a very good friend was hit and killed by a motorist and both times the teenager was walking in the only place they could and driver was at fault both times.
You are trying to promote urban living and this is a must for urban living and the Cowboys Stadium
After living in College Station, TX, a very bike friendly town, I believe the citizens of Arlington would greatly benefit from having bike lanes available.
Please have street cleaners keep the existing bike path on Calendar Road clear of sand, glass and other debris. I am a recreational biker in the sense that this is my preferred means of exercise. I ride a 12 mile circuit at least 3 times a week and once a month do a Saturday "bike hike" of 25-30 miles. The circuit includes the full extent of the bike path on Calendar Road. My morning ride starts at 6:00 AM and I typically see another 4-5 bikers out riding along the way. Many more bikers are out on Saturdays. My personal goal would be to increase "off road" concrete paths through every existing park, and to connect these greenways to "on road" bike paths like the proposed circuit. There is no way to ride distances of 15-20 miles in South Arlington without riding on streets with heavy auto traffic. Contrast this to my former home in Fort Worth where I could connect on back streets and bike paths to the Trinity Trail and parks that took me almost out to Benbrook Lake with another 24 miles of roadway ideal for biking away from traffic. It was possible to do different routes of 35-40 miles from my own driveway! Calendar Road bike path does not connect to the new bike path circuit. Could there not be a link on Sublett or perhaps one of the streets just north of it? Projections do not seem to contemplate connecting to the Mansfield Linear Park from Alice Ponder School to the park off Hwy 287 and Broad. Could the Calendar Road bike path be extended south? Additional Note: There is no safe way to commute to my work on a bicycle, or I would consider it for 2 days a week. There is no viable mass transit system, such as train/bus, which have a dependable schedule. If it were to be safe, clean, with convenient arrival/departures I would use it.
Bike lanes, bike lanes, bike lanes.
We love River Legacy. I would like to see more trails, bike lanes that connect to this system. We would certainly use them.
Need well marked feeder paths to UTA to encourage walking. Need to connect all the bike paths around Arlington, e.g., Village Creek southward. Need a Friends of the Park Foundation like River Legacy so people can support their parks by helping out. There is no way now to support a park. It is difficult to volunteer. I tried and the person I was to help never showed up and no one ever followed up. Need to spend some of the money given in exchange for land given to the Cowboys on parks and paths. There were promises, but have not seen any results.
Hurry!
I would like to support improving this initiative any way possible. Please contact me and keep us in the loop!
I applaud the City's efforts and maybe something good will come of it. But like I said, a street striping program won't cut it. But I admit I don't know what to do either other than that. If you can figure out some way to get the bicycles off the street and onto the dirt that would be the best.
Very hard to decide on some items. Professionals will help a lot. Our city has a long way to go.
I haven't heard back from the Parks Dept. about the need to have a jogging shoulder along the River Legacy paved trails made from shredded tires
Use existing power line rights of way to connect bikes to streets
Some roads are too narrow to have bike lanes & too much traffic, like Bowen Rd.
Need to post the biking trails in the phone book.
Bikes are necessary since there is no public transportation. This makes them a higher priority in Arlington than other cities.
The City needs more off road biking trails. The small amount at River Legacy is inadequate.
Biking is very important to me. I am disabled and would love to be able to use my bicycle more to go on errands and just get out in general. My wheelchair will not take me anyplace in Arlington because of the terrible conditions of the sidewalks, roads, crossroads and curb cuts. I would like to see the City encourage businesses to have bicycle racks.
It is imperative to our City's physical health that we encourage biking/walking to destinations by improving the conditions. It would be really nice to have decent paths to the rec centers and parks if nothing else can be done.
City ordinance requiring motorists to allow 3 feet when passing a bike. Driving schools should be required to tach proper driving skills regarding bicycles on the road.
Is there a citizens advisory committee to be formed?
Move off road recreational trails and dirt trails connecting parks and points of interest.
Biking into downtown
Will be glad to talk to our neighborhood and church
I work in Arlington and would love to commute safely on bike. Restrict texting while driving and pass safe passing law - 3 ft. Add bike passing courtesy instruction to defensive driving classes.
Yeah bike lanes UTA
Thank you. May you open minds best luck. A Texas not Arlington issue. Youngster growing up in Arlington biked all over. I hope Arlington's future youngsters get that opportunity.
Big emphasis on trails and greenways as off road trails for transportation and recreation.
More off road trails that connect to different destinations and recreational Parks.
My kids would benefit from trails and greenways
Make paths skateboard and roller blade friendly by minimizing size of expansion joints. Similar to trinity Trail path mile marker 2 to 7. When pouring concrete consider 'skateable' options.
Repeal helmet ordinance
Get it done
Prefer money spent on the planned off-road trails before on-street improvements
Prioritize sidewalks on major streets the take on secondary projects such as this. It is a clear indication the City needs sidewalks when people on motorized wheelchairs are ducking in and out of vehicular traffic due to absence of sidewalks in various areas.

Skateboarding is a mode of transport
Integrate small skate parks along new Blue Path
Roller blade paths with access to shops/stops so not to lose out on roller blading completely
Hook up Rover legacy and Trinity Trails
Connect River Legacy to Trinity Trail + TRE at Bell
More trails, more lanes. Connect trails to paths.
Mel LeBlanc, he's not in tune. Snide comments accomplish nothing.
Commercial encouragements for non car facilities i.e. bicycle security walkers rests, bathroom facilities.
Bike lanes on Arkansas
We need public transport
Bike lanes
Bike lanes
Have more public meetings. City Council support + public transportation
Mandate 3 ft. passing law.
Note I'm here represnting Bike DFW (bikedfw.org) Let us know how we can help.
Speak to DORBA and FWBA for more MTB trails
Add bike lanes
Start with UTA and expand
We need bike lanes, everywhere and police to enforce them.
It would be great to have bikeways that connect all parts of the city. Even better would be bikeways that are not part of the roadway system. Drivers show little or no respect for cyclists, and simply providing a bike lane on a busy road will not make things safe for cyclists.
It would encourage walking and biking if one could walk to the Highlands or to the Mall or to Walmart for that manner, but now it is just not safe.
Yes bike trail next to my house, I live in the Bent Oak Estates.
Need to connect trails to Skate Board Park. Keep funds in skateboard park
Inform public about bicyclists rights. Increase penalties for unsafe activity around bicyclists
I'd like to bike to Stadium but I'm realistic.
Trails and sidewalks are a great investment in the community!! Upgrades and improves the area!
Concentrate improvement on city center/UTA areas first to encourage density/discourage further sprawl
Sidewalks, sidewalks, sidewalks!
You have challenge ahead. Engineering community against bike lanes and bicycle traffic in general.
Trails need to be beautiful, safe and practical. Building them will increase property values
Skaters need parks and sidewalks to get them there.
Need to build skate park on intersect bike/hike.
Drivers to slow down when approaching humans.
Spend money on paths at UTA, Parks Mall, Downtown etc. Then work on connectors
Look at Boulder CO as example to develop trails and bike lanes. Need to connect River legacy to South Arlington.
More money on bike lanes and signals less on road construction
New law stating cars equal to bikes so need at least one car length to overtake.
Encourage events in central yo bring bikers from all locations of the city
Drainage is poor on existing trails
Add signage saying bikes in area.
Need north-south bike route
I plan on moving within a year, this is a big factor as to where I decide to move to.
Remember people in wheelchairs; there was a population explosion after WWII
Would love to connect to Dallas/FW and have north/south/connection
Make addition of bike lanes a standard procedure when new roads are built or old roads are rebuilt
Please hurry up & have a bike friendly Arlington. Get together with UT-Arlington too!
A segmented system is not a solution.
Hike & bike along Union Pacific RR.
We need Arlington to be bike friendly!
Do it!
Trinity Trail connect to Legacy Park. Like to be able to ride around Joe Pool Lake safely. 3-foot to pass.
Do it now, not later, please.

Responses to question #20 (Do you have any further comments or ideas?)

City should provide maps for biking trails.
Would like to see a connection between River Legacy Park and Gateway Park
Connect to Fort Worth trails. Park & bike to Cowboy & Ranger games?
Need more trails around Arlington.
To me, a quality of life issue. Arlington needs great improvement - ugly, decentralized, unfriendly, uninviting. Wouldn't choose Arlington if choosing today.
Absolutely. No private property should be seized through eminent domain or buyouts in order to create biketrails for the few. This would include the construction or moving of sidewalks to facilitate the creation of a biketrail. At the minimum, 5 to 6 feet should exist between any such construction and the homeowner's property line. During a recession/depression - is this the proper time to spend taxpayers' money in this fashion? Shouldn't public safety (police & fire) be their first priority.
Like to see a bike lane to the South Arlington Park & Ride Lot both ways. Like to see Trinity Trail connect to Legacy Park. Like to be able to get to Joe Pool Lake safely on a bike. 3-foot passing City ordinance.
My daughter and her friend were walking in our neighborhood on the correct side of the road along the curb and struck by a card. They were hurt, but survived. That was 9/16/08. Her friend was hit again 8/6/09, but didn't survive. Again, he was walking where he should have been -- protect pedestrians.
The Fouth Fielder/Gunn Jr. High area is lacking in both pedestrian & cycle facilities.
Please think about using the area next to Rail Road Track for a linear path from Green Oaks to downtown Arlington. What about the stadium? I can not believe we do not have bike racks at the stadium.
I live in Eagle Chase subdivision near Martin H.S. We are VERY concerned about the dangerous situation at the "Old Pleasant Ridge Road" curve where kids walk to school and there is no sidewalk on the "curve" (between Pleasantview Road and the new Pleasant Ridge Road). We petitioned for a sidewalk during the recent road construction, but we were turned down. I almost hit a girl the other morning who was walking to school in the early morning hours and was walking on the street due to the rain. I would like to see a safe path there. I do not want to see another child killed by a car!
Suggest bike/jogging trail from Kelley Park, south along creek (Kee Branch) to Pleasant Ridge Road. This could be a future link between Lake Arlington & Legacy Park.
My husband and I have been waiting more than 30 years for Arlington to become more pedestrian and biker friendly.
Arlington needs to add one second to yellow lights at major intersections. When riding, I'm often in the middle of an intersection when the light turns green for crossing traffic.
Reduce traffic speed on streets like Davis (i.e., not streets like Cooper.) Arlington is one of the worst cities I have lived/visited in the area of pedestrian conditions. Sidewalks begin/end at random. Lack of sidewalks in many areas. Tight roads, high speed, narrow sidewalks, poles/trees in middle of sidewalks. I wouldn't walk more, but I would have safer/better access to other areas. Also, I would walk further. I would ride bike to the TRE if a safe route existed, or ride a bus to the TRE.
If there was a bicycle lane on any major street to get go River Legacy Park that would be great and I might ride my bike to work.
We really need a skate park it would decrease crime and give kids a place to skate safely with out the danger of getting hit by a car. Also take skaters out of public areas were they are not wanted.
First, it's good to know you're giving this some thought. Second, I like some of the things already in place - such as River Legacy/Findlay/Village Creek and Cravens(?) to Grand Praire. Parts of Arlington will be challenging to make attractive to walkers & bikers, but there is much that can be done. Continue to create the right environments where we can (especially to recreation centers, libraries, etc.), and then look for ways to connect them. Organize activities (tours, rides) that use existing trails as a way to increase awareness. How do I get involved?
Please complete the sidewalk on Calender!
Need a bike area like River Leg on our end of town - it's fabulous!!!! but too far away! My daughter wants to ride her bike, but the streets aren't a safe place to ride.
Not at this time...
I am excited to see how we can improve bike/walkability throughout the Arlington area
One major bicycle lane that runs North-South and one that runs East-West would be an extremely beneficial start towards making Arlington more biker friendly.
Please, please let this greenway become reality!
Insurance for bike riders on roads
Veterans Park is a 103 acres and has only 1 water fountain in the north end of the park!
Lets get families together to exercise and to get moving
I live very close to River Legacy Park, but the thought of riding my bike to the park is very scary because of motorists have no consideration for bikers.
Bike lanes and public bike racks would be amazing for central and downtown Arlington!
Bike festival involving trip around Arlington on green oaks starting and ending at major tourist attractions (like hhh)
Not having safe Bike and Hike pathways have made our family consider moving to another city that is more bike and hike friendly
Love the proposed sidewalk adds - especially on my street (Margaret Dr.). Wonder why no one from Arlington ISD transportation is on the planning committee when increasing walkers to school and reducing bus trips are sited as goals. Wonder about lack of trails to and around Lake Arlington.
I really like how Boulder CO has their bike paths going under the highways and not have to deal with the heavy traffic.
I like the design of Boulder, CO's bike trails, especially the creek path that winds through the middle of the city and how the bike trails go underneath existing roads.

Responses to question #20 (Do you have any further comments or ideas?)

You need to target women as cyclists and pedestrians. We need to make women feel as safe as possible, because they are the ones that will get the whole family walking and/or biking.
I know a TON of folks interested in this - wheelbrothers.com - we'll try to get the word out
The hike & bike will also help with our children being able to ride to school. As of now, she can't because there are no sidewalks & people drive crazy.
Excited about a pedestrian and bicycle plan!
Potholes are my biggest complaint. Next to that is the tree branches that cover walkways that may cause you to fall into oncoming traffic when your biking.
You have a great trail through River Legacy, but it needs to be extended to a train station to link to the Trinity Railway. This would open up a whole new level of transportation. Other thoughts: It is very important to create safe routes to schools. How many kids ride bikes to school today? Traffic is too heavy around schools to let a kid ride to school. Police need to be responsive when aggressive drivers threaten cyclists. I have been threatened and physically assaulted by our own police for riding a bike on a residential road. Your plan starts with putting police on bikes and having them ride to understand their own driving behavior. Next thought: Bike lanes that are less than a mile are insulting. These are not lanes and will not be used by cyclists. The bike lane on Center St. before Park Row is a waste of resources.
Spend the money for this project in areas with low crime; not south Arlington. S. Arlington has trails that I see that are not used.
Thanks! We've been needing this for years!
Please add safe biking paths to the Stadium and Rangers Ballpark. As a publicly owned stadium we should encourage our residents to reduce road congestion and ride the short distance to the stadium.
Thank you for looking into this
In your presentation, list other greenway projects. Show your project is not just a fad or is being done only in your area.
Other than River legacy and village creek trail Arlington doesn't have much - hard to list the most needed corridors when we need so much. Bring back the Johnson Creek bond package, I think it would pass on it's own. Start with the possible green belts then look at bike lanes on existing streets.
Good Luck!!
I would love to see improvements on the roadways for bikers!
See Bogota, Columbia-- thats "success"
Thank you!
Finish existing plans
Like the "Don't mess with Texas" slogan for the clean up initiative- the hiking and biking system needs something to change citizens idea of walking and biking. I've been fortunate to have lived in Europe and other U.S. cities (okay just one- Albequerque, NM) where it was more accepted to travel using alternative transportation (city transportation, buses, trains) bike paths and sidewalks.
Please vote YES for the hike and bike system
Thank you for making Arlington better for cycling
Extend Eastchase trail to Fort Worth Trinity Trails
We need better education of public for cyclists
LOOP ARLINGTON TRAIL?
I cross Arlington a lot by bike from both Irving/Ft. Worth and Grand Prarie
Arlington needs public transportation, how can we be a city this large with no buses, or bike lanes?
Thought about using power line right of way? You're obviously going to pave something. Lots of connectivity there.
Please help DORBA members by keeping us updated via the e-mail link above
ADD A BIKE LANE ON MAJOR ROADS, HAVE A BETTER NETWORK OF TRAILS
Need more bike\walk friendly city to keep people here
Education
Would like to have trails in central Arlington, to supplement River Legacy
Please provide bicycle lanes and better walk way. Thanks
I refuse to ride my bike because it's dangerous. I run, and going north up Green Oaks/Dottie Lynn is beyond dangerous.
Far too late.... but, finally city officials are starting to open their eyes.!!!
Ordinances for aggressive motorists and public education about pedestrian right of way and cycling coexistence
I would like to see more runner-friendly areas. I often go to White Rock Lake or Trinity Trail. Arlington parks are mostly concrete surface - not good for runners. Arlington roads are often dangerous and lighting is poor.
I would like to see some crushed cinder or similar unpaved paths for jogging since that is better than running on concrete or asphalt.
Yes - I run regularly and the street lights are often off on Davis. In addition, Fielder has horrible tree overgrowth. I spend a lot of time outside running and recently had a baby. I have to push him in the stroller in the street because the sidewalks are so bad (bumpy and there are no ramps). I often wonder how people in wheelchairs get around - they probably use the street too. I am thrilled to hear that Arlington is considering a hike and bike system. It would be wonderful to be able to bike to River Legacy or to run safely to River Legacy. The public health benefits of improving safe access to means of integrating exercise into daily activities is very important. Thank you.
As a runner my big problem is that the sidewalks that we do have are uneven and are a fall risk and many are old, so one must get over the curb it is not smooth from street to curb or curb to street. The new ones address this problem but because where I live it is not a smooth transition and they are uneven, I prefer to run in the street it is easier on my body to run in the street, yes, I have had cars swerve at me, but I getting good at dodging them. :)
Triple the time on yellow lights with cameras

Responses to question #20 (Do you have any further comments or ideas?)

I see the web site has not been updated since January ?!
Get some bike lanes built. Not Share-ROW, not “just use the sidewalk”
Lower parking requirements, particularly as an incentive for better streetscaping and limited front-of-business parking
Sidewalks on Pioneer, PLEASE!!!!!
I ride Cravens Park to Linear park in Grand Prairie. There are more people there maybe because equipment and park benches they have. Please ride it and see what I am talking about.
Go capture the ideas Graham Schadt had ~20+ years ago.
Make cycling safe. 689 cyclists die per year. I hate riding on sidewalks so I can live.
There is a big recreational walking/biking community in my area - the improvements in the S. Kelly Elliott/Park Springs/Green Oaks/Sublett area (near/around Boles Junior High) are noticed and envied by my area! :) I always see so many people taking advantage of cycling in their area, just on the other side of 287. Would love to have something similar/very cycling-friendly.
Long overdue
We need bicycle sharing system like Denver CO
Would like to see River Legacy trails meet up with Ft. Worth Trinity trail
Less concrete and more trails
Sidewalks need to be extended even more that are near schools. It’s so unsafe for the sidewalk to end and the child has to keep walking or biking. If we made it more convenient to get out and walk or bike more people would do it.
I am a runner and would like to see safer areas where I can run. The trail at Cravens Park is pretty yucky but could be really beautiful. As it is, I’m a little afraid to run there without a friend with me.
Please connect to the Fort Worth and Dallas hike/bike systems!
Sidewalks are not maintained. Too much glass and debris after drunken revelers leave sporting events that never gets cleaned up. It discourages walkers and riders. These same crowds on arriving at the stadium are only looking to park their cars. They are often frustrated and aggressive toward pedestrians/cyclists.
Community education on bicycle safety and road rules; community initiative against litter in existing park paths - the current amount of litter is awful; need lights along major paths for safe night use.
Please follow through with this. It’s a wonderful project
Take action to get more for DART connections (trail, trans, etc)
Commit to a plan and then stick to it. Get funding dedicated. Stop doing as bits and pieces and get going on the major connectors.
3 foot to pass
3 foot to pass
3 foot to pass
3 foot to pass
3 foot to pass

B. PROGRAMS & RESOURCES

Appendix Contents

Overview

Education Programs and Resources

Encouragement Programs and Resources

Enforcement Programs and Resources

Overview

This appendix contains additional programs, descriptions, and resources not described in Chapter 6. Model programs from across the United States are featured for potential replication and customizing in Arlington, Texas.

Education Programs and Resources

Public Education and Educational Devices

Arlington should build on its existing programs by continuing to develop a variety of safety materials and distribute them widely throughout the community. Educational materials may include important bicycle and pedestrian laws, bulleted keys for safe bicycle and pedestrian travel, helmet requirements, safe motor vehicle operation around bicyclists and pedestrians, and general facility rules and regulations. This information is often available for download from national pedestrian advocacy organizations, such as the Pedestrian and Bicycle Information Center website, www.pedbikeinfo.org.

Brown-bag events and clinics are also an excellent way to provide education, especially for adults. Local events should be utilized to distribute information using a booth to display related print media. A representative from the newly formed HBAC could volunteer at the booth to answer questions and promote bicycling and walking in Arlington.

Motorist Education

Equally important as bicyclist education is motorist education. Many motorists do not recognize that a bicycle is considered a vehicle by Texas state law. Several examples of safety materials are available. The Pedestrian and Bicycle Information Center website outlines tools and skills related to motorist education and provides other useful links:
www.bicyclinginfo.org/education/motorists.cfm

A *Driver's Handbook* is a useful educational tool, with an entire section devoted to bicycles, bicyclists' rights and responsibilities and how motorists should behave. Programs to promote bicycle and

pedestrian safety could also be included in new driver education classes. Example resource (page 95 on the following link):
www.ncdot.org/dmv/driver_services/drivershandbook/download/NCDL_English.pdf

The *StreetSmart* public awareness campaign in the Washington, DC region is another example of a Public Service Agency educating residents about pedestrian and bicycle safety.
www.bestreetsmart.net/

LCI Training/ Bike ED
The League of American Bicyclists (LAB) has a national bicycle education program (Bike ED) that includes training to become certified League Cycling Instructors (LCI's). LCI's are trained to teach local bicycle skills training courses. Already, there are 5 LCI's in Dallas and 1 LCI in Fort Worth, but none in Arlington. Ideally, all HBAC members and key City staff would take LCI courses or even become LCI instructors themselves. This effort should continue with expansion to other state, federal and municipal agencies.

Bicycle Ambassador Program
The newly formed HBAC should begin this program as an early initiative. The Bicycle Ambassadors Program would be the bicycle outreach and education component of the HBAC, promoting bicycle safety and awareness. Programs around the country promote safety for all road users, bicyclists, motorists, and pedestrians. Members of the HBAC may volunteer to be ambassadors, as well as recruiting community members to be ambassadors. Ambassadors host and attend programs, demonstrations, and activities at events, summer camps, and schools. One very successful model program is Mayor Daley's Bicycling Ambassadors in Chicago (www.bicyclingambassadors.org/) where the group includes adult and junior ambassadors, hosts a number of educational events, and gives presentations that promote bicycling. Local bicycle shops and groups in Arlington should be involved.

Bicycle Map Education
The City of Arlington should maintain an updated bicycle and pedestrian map that includes new bicycle facilities and new greenways. This map is an opportunity for the City of Arlington to present education and safety materials including basic safety information, commuting information, trail etiquette, transit information, and a list of local resources on the back side of the map. This map should be developed as a foldable hardcopy map or on a website.

Image from www.cyclingambassadors.org/

Bicycle Helmets Program

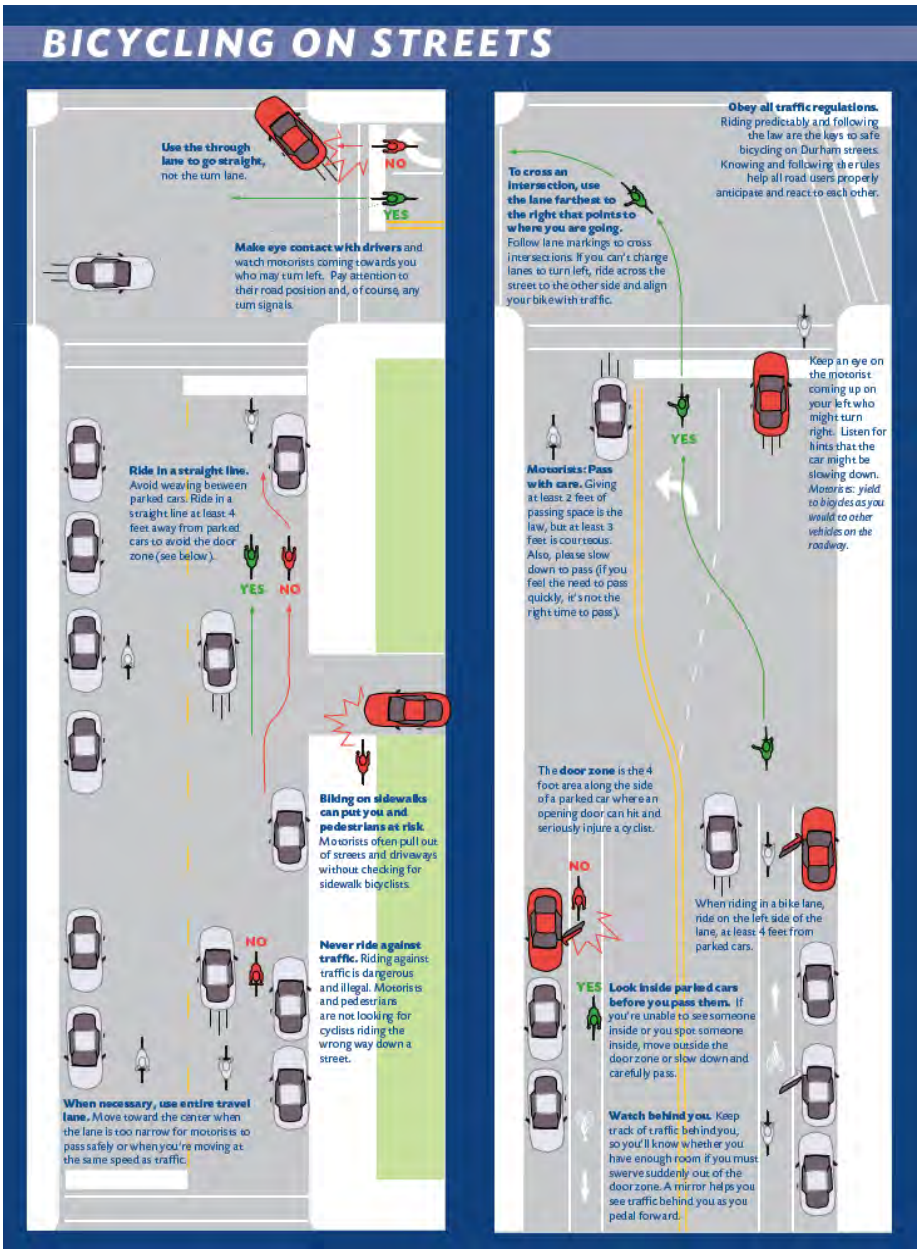
The City of Arlington and the HBAC should form a charity program aimed to ensure young cyclists are educated and equipped to take part in bicycling. The main objective would be to increase helmet wearing among children.

School Crossing Guard Training Program

As traffic continues to increase on streets and highways, concern has grown over the safety of our children as they walk and bike to and from school. At the same time, health agencies, alarmed at the increase in obesity and inactivity among children, are encouraging parents and communities to get their children walking and biking to school. It is important to ensure that crossing guards are trained and provided at every school in which there are pedestrians.

Environmental, Cultural and Historic Education/Interpretation

Educational programs and interpretative signage could be developed along greenways.



Example educational material from the Durham Hike & Bike Map (designed by Greenways Incorporated)

Greenways provide opportunities for learning outside the classroom. Specific programs that focus on water quality and animal habitat are popular examples. Simple educational signage would offer interactive learning opportunities for people who use the trails. Brochures can be used to supplement signage with more detailed information and a map of the interpretive system.

Teaching

The City of Arlington and HBAC could lead a number of teaching efforts for people of all ages. This may include bicycle commuter and parent courses, walkability workshops in multiple communities, bike education curriculum road courses, and bicycle rodeos. Bicycling rodeos, training sessions, summer camps, and other educational activities should be continued and promoted so that safety skills can be taught on an ongoing basis. The HBAC should ensure all of these efforts are extended throughout Arlington.

Education Resources

The *Pedestrian and Bicycle Information Center* website provides important messages for a range of different audiences that can be part of an educational campaign or program. It also offers links for finding more information related to bicycling education:
www.bicyclinginfo.org/education/

The League of American Bicyclists has been working for better cycling in America since 1880. They do this by promoting bicycling, educating cyclists and motorists, and advocating on behalf of cyclists on Capitol Hill and with state legislators across the United States. This web page has information on some of their programs:
www.bikeleague.org/programs/index.php

The mission of the *National Center for Bicycling and Walking (NCBW)* is to help create bicycle-friendly and walkable communities across North America by encouraging and supporting the efforts of individuals, organizations, and agencies. The website provides information on the workshops they offer for the general public as well as for training professionals:
www.bikewalk.org/workshops.php

Safe Communities is a project of the National Highway Traffic Safety Administration (NHTSA). Nine agencies within the U.S. Department of Transportation are working together to promote and implement a safer national transportation system by combining the best injury prevention practices into the Safe Communities approach to serve as a model throughout the nation.
www.nhtsa.gov/Driving+Safety/Safe+Communities/Welcome+to+Safe+Communities

Safe Kids Worldwide is a global network of organizations whose mission is to prevent accidental childhood injury, a leading killer of children 14 and under. More than 450 coalitions in 15 countries bring together health and safety experts, educators, corporations, foundations, governments and volunteers to educate and protect families. Visit their website to receive information about programs, media events, device distribution and hands-on educational activities for kids and their families.
www.usa.safekids.org/

LiveSmartTexas is a statewide movement that promotes increased opportunities for healthy eating and physical activity wherever people live, learn, earn, play and pray. www.livesmarttexas.org/

American Trails supports local, regional, and long-distance greenways and trails, whether in rural or urban areas. The website contains studies and reports that can be referenced in educational materials: www.americantrails.org/resources/

Worldcarfree.net is a clearinghouse of information from around the world on how to revitalize towns and cities and create a sustainable future. In addition to serving the carfree movement, Worldcarfree.net offers resources for architects, planners, teachers/professors, students, decision-makers and engaged citizens:
www.worldcarfree.net

Encouragement Programs and Resources

Amenities at Work
Some employees will not consider biking or walking to work without the assurance that they can shower when they arrive. Showers also allow employees to exercise at lunch. In buildings with 50-100 employees, one shower should be sufficient. In buildings with 100- 250 employees, one shower for each sex should be provided. Buildings housing over 250 employees should provide at least four showers with two of them being accessible to the disabled.

Ideally, there should be one lockable gym locker for every long-term bicycle parking space provided where the regular bicycle commuter can store work clothes. In addition to providing a locker to each regular bicycle commuter, other lockers should be available to encourage potential new bike commuters. These facilities will also encourage lunch-time fitness activities which benefit both the employee and the employer.

Awareness Days/Events
A specific day of the year can be devoted to a theme to raise awareness and celebrate issues relating to that theme. A greenway and its amenities can serve as a venue for events that will put the greenway on display for the community. Major holidays, such as July 4th, and popular local events serve as excellent opportunities to distribute bicycling information. The following are examples of other national events that Arlington can use to improve usage of bicycle facilities:

Car-Free Day (September 22)
Car-Free Day is an international day to celebrate getting around without cars. This fall event coincides with the beginning of the school year and is the perfect way to kick-off programs that promote bicycling and raise awareness for environmental issues. Car-Free events can last for an entire week or month, featuring alternative transportation promotional activities, fitness expos, transit-use incentives, walking and jogging group activities, running and bicycling races and rides, etc.

"Strive Not to Drive Day"
This event example, from the Town of Black Mountain, North Carolina, is an annual event to celebrate and promote the Town's pedestrian achievements for the year throughout their region. Awards for pedestrian commuters, as well as booths, contests, and other events are organized through their local MPO Bicycle and Pedestrian Task Force and the Land-of-Sky Regional Council. A similar event could be held in Arlington to focus on walking or bicycling issues, as the Hike and Bike System Master Plan is implemented.

National Trails Day
This event is held every year in June. Other events, competitions, races, and tours can be held simultaneously to promote trail use within Arlington. For example, in Greensboro, North Carolina, the Parks and Recreation-Trails Division sponsors events for National Trails Day, and it has become a huge event for the entire city. The regional trail system would be a perfect location for hosting an event.

Earth Day
Earth Day is April 22nd every year and offers an opportunity to focus on improving the

environment. Efforts can be made to encourage people to help the environment by bicycling to destinations and staying out of their automobiles. This provides an excellent opportunity to educate people of all ages in Arlington.

Use Facilities to Promote Other Causes

Hike and bike facilities could be used for events that promote other causes, such as health awareness. Not only does the event raise money/publicity for a specific cause, but it encourages and promotes healthy living and an active lifestyle, while raising awareness for bicycling and walking activities. Non-profit organizations sponsor existing events that could easily be hosted, including:

- American Diabetes Association's Tour de Cure - a series of cycling events held in more than 80 cities nationwide.
- American Cancer Society's Relay for Life - a national and international all-night team walk to celebrate cancer survivors and raise money for cancer research.
- Leukemia and Lymphoma Society's Light the Night Walk - a walk held to raise awareness of blood related cancers and money for research to find a cure for such diseases.

Bicycle and Pedestrian Activities/Promotion within Local Organizations

Arlington has numerous organizations that could be utilized to promote bicycling and walking activities (e.g. the local bicycle stores, local cycling groups, local schools/PTAs, neighborhood groups, homeowners associations, etc). Education, enforcement, and encouragement programs can be advertised and discussed in local organization newsletters, seminars, and meetings. Such organizations could even organize and cross-promote their own group rides, trail clean-ups, and other activities listed in this section.

Cycling Clubs/Bicycle-Commuting Groups

A number of bicycle clubs exist throughout the Dallas-Fort Worth-Arlington region. Neighborhoods, local groups, or businesses could promote cycling clubs for local residents or employees to meet at a designated area and exercise on certain days before or after work (or even to work), during lunch breaks, or anytime that works for the group. This informal group could be advertised on local bulletin or information boards. These clubs could be specialized to attract different interest groups. Clubs and bicycle shops provide opportunities for group rides. These rides should be promoted by the City of Arlington and the HBAC, reaching out to bicyclists of all abilities.

Art in the Landscape

The inclusion of art along greenway corridors and trails would expand upon Arlington's culture of public art, while encouraging the use of facilities and provide a place for artwork and healthy expression to occur. Artwork could be displayed in a variety of ways and through an assortment of materials. Living artwork could be "painted" through the design and planting of various plant materials. Sculpture gardens could be arranged as an outdoor museum. Art through movement and expression could be displayed during certain hours during the day or during seasonal events.

Special University-Based Programs
The City of Arlington should work with local colleges and universities, such as UT-Arlington, to develop a comprehensive network of campus bicycle and walking routes that are connected with to the bicycle and pedestrian system in the surrounding areas. Integration with colleges and universities will allow greenway and bike facilities to cater to one of the network's largest user groups.

Adopt-A-Trail
Local clubs and organizations provide great volunteer services for maintaining and patrolling trails. This idea could be extended to follow tour routes or specified streets/sidewalks. A sign to recognize the club or organization could be posted as an incentive to sustain high quality volunteer service. The Boy Scouts of America serve as a good model for participation in this type of program.

Revenue Generating Programs
The City of Arlington should be proactive in increasing revenue from programs and events that can help fund the construction management, and maintenance of the hike and bike system. Specific program and event ideas that are being used to generate revenue across the country include:

- Races/triathlons (fees and/or donations)
- Concessions
- Educational/Nature/Historic tours (fees and/or donations)
- Fund-raisers including dinners/galas
- Moonlight bike rides and walks (fees and/or donations)
- Greenway parade (fees and/or donations)
- Concerts (fees and/or donations)
- Art events along greenway (fees and/or donations)
- Events coincide with other local events such as fairs, festivals, historic/folk events, etc.
- Media events and ribbon-cuttings for new trails and bicycle facilities (donations)

Encouragement Resources
Safe Routes to School is a national program that dedicated $612 million from Congress from 2005 to 2009. Local Safe Routes to School programs are sustained by parents, community leaders, and citizens to improve the health and well-being of children by enabling and encouraging them to walk and bicycle to school. This funding can also be used towards the development of school related programs to improve safety and walkability initiatives. The state requires the completion of a competitive application to apply for funding and a workshop at the school to determine what improvements are needed. www.txdot.gov/safety/safe_routes/default.htm

Bikelowa provides a good resource, the "Employer's Bike to Work Guide," providing ideas for encouraging bicycle commuting:
www.bikeiowa.com/asp/bike/EmployerGuide.asp

This web page from the *League of American Bicyclists* has information on encouraging bicycle commuting:
www.bikeleague.org/resources/better/commuters.php

The role of the *Active Living Resource Center (ALRC)* web site is to provide resources and tools to help make walking and bicycling part of your community's healthy lifestyle. This page of the website has encouraging success stories from other communities:
www.activelivingresources.org/stories_directory.php

Bikes Belong is sponsored by the U.S. bicycle industry with the goal of putting more people on bicycles more often. From helping create safe places to ride to promoting bicycling, they carefully select projects and partnerships that have the capacity to make a difference. Their work concentrates on four main areas: federal policy and funding, national partnerships, community grants, and promoting bicycling. In addition, they operate the Bikes Belong Foundation to focus on kids and bicycle safety.
www.bikesbelong.org/

Enforcement Programs and Resources

Motorist Enforcement
Based on crash data analysis and observed patterns of behavior, law enforcement can use targeted enforcement to focus on key issues such as motorists speeding, passing too closely to cyclists, parking in bicycle lanes, etc. These issues should be targeted and enforced consistently. The goal is for bicyclists and motorists to recognize and respect each other's rights on the roadway. See this link from an Austin bicycle advocate that includes a printable, foldable summary of bicycle and motorist rights and responsibilities: http://bicycleaustin.info/laws/handout.html

Bicyclist and Pedestrian Enforcement
Observations made by local trail and bicycle facility users can be utilized to identify any conflicts or issues that require attention (see online public comment form results). To maintain proper use of trail facilities, volunteers could be used to patrol the trails, particularly on the most popular trails and on days of heavy use. The volunteer patrol can report any suspicious or unlawful activity, as well as answer any questions a trail user may have. When users of the bicycle or pedestrian network witness unlawful activities, they should have a simple way of reporting the issue to police, such as a hot line.

Additionally, unsafe cycling and walking (e.g. riding on the wrong side of the street, without lights at night, or crossing roadways not in a marked crosswalk) should be addressed by local law enforcement through warnings, with an understanding that there may be a learning curve for new or inexperienced cyclists and pedestrians. Again, the goal is for bicyclists, pedestrians, and motorists to recognize and respect each other's rights on the roadway.

Local Police Input
An appointed member of the police forces should serve on the HBAC if possible to understand issues in the area and contribute to the process. Police understand firsthand the common bicycle and pedestrian problems, issues, and areas of concern.

Police on Bikes
The City of Arlington currently does not have police bike patrols. Increased use of police on bikes is a significant benefit for community policing and quality of life. This idea should be coordinated with and extended to include enforcement within the college campuses. Police on bicycles should be models for other cyclists by wearing helmets and riding accordingly.

Mandatory Helmet Law
The City of Arlington should consider enacting a new mandatory helmet law for their residents. Currently, the City of Arlington requires children to wear helmets. The City should consider options such as mandatory helmet laws for all ages or possibly increasing to ages above 16. The National Highway Traffic Safety Administration (NHTSA) supports the enactment of bicycle helmet usage laws by states and municipalities. This is due to statistics that prove bicycle helmets provide protection (Example: Helmets are 85 to 88% effective in mitigating head and brain injuries). A number of communities throughout the country have made helmet usage mandatory for all ages especially in the states of Missouri and Washington. For more information, visit http://helmets.org/mandator.htm and www.

bikeleague.org/media/facts/pdf/BicycleHelmetUseLaws.pdf

As an enforcement/education measure, the City of Arlington, through partnership with local shops and groups and the HBAC could distribute prizes to children seen wearing a helmet. Enforcement should not be heavy-handed, but rather an opportunity to educate and encourage helmet usage.

Enforcement Resources

The *National Highway Traffic Safety Administration (NHTSA)* awarded a grant to MassBike to develop a national program to educate police departments about laws relating to bicyclists. The program is intended to be taught by law enforcement officers to law enforcement officers as a stand-alone resource. The link contains downloads for presentations, videos, and other resources that are useful for police officers and everyday cyclists alike: www.massbike.org/projectsnew/law-officer-training/

The *Pedestrian and Bicycle Information Center* has a wealth of resources regarding enforcement issues, ranging from training for local law enforcement to procedures for handling violators, to enforcement example case studies: www.bicyclinginfo.org/enforcement/

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C. HIKE & BIKE POLICIES

Chapter Contents

C.0 Overview

C.1 Local Policies (City of Arlington)

C.2 Draft Arlington Comprehensive Plan Draft (2010)

C.3 Bicycle Ordinance (standalone ordinance)

C.4 Bicycle Parking Ordinance

C.5 Existing Federal and State Policies

C.6 Complete Streets Policy

C.0 Overview

Federal, state, regional, and local policies influence and drive future planning, design, and development. Policies are established in the Arlington Code of Ordinances, Zoning Ordinance, Subdivision Rules and Regulations, Design Criteria Manual, and Comprehensive Plan. The purpose of this task is to evaluate existing local policies, codes, and ordinances to determine how these documents support biking and walking. There are opportunities for existing policies in these documents to be strengthened to improve accommodations and safety for bicyclists and pedestrians.

Sections C-1 and C-2 of this chapter provide suggestions for policy enhancements that the City may want to consider. Section C-3 presents a standalone bicycle ordinance that could be used to amend existing City of Arlington bicycle ordinance text. Section C-4 presents a sample bicycle parking ordinance for consideration. Section C-5 describes the growing national trend of Complete Streets policy that the City of Arlington should consider emulating. Section C-6 describes existing policies at the national, state, and regional levels.

C.1 Local Policies (City of Arlington)

An analysis of the Zoning Ordinance, Subdivision Rules and Regulations, Code of Ordinances, Design Criteria Manual, and the Comprehensive Plan was conducted during this planning process. These are the guiding documents for development in the City of Arlington. There is significant room for improvement for requirements and design standards. The City should consider modifying local ordinances to provide a balanced approach to both on and off-street bicycling and walking, ensuring a stronger connection between land use and transportation, especially bicycle and pedestrian travel.

A table (shown below) has been developed that presents text from these policy documents related to bicycle and pedestrian development issues along with suggested changes the City may want to consider.

City of Arlington Hike & Bike Policy Analysis

Source	Reference	Existing Text	Suggested Change	Notes
Zoning Ordinance	Article 2: Interpretations and Definitions	Sidewalks. Sidewalks are normally placed in the right-of-way 1' from the property line and are 4' in width. Sidewalks designed to serve commercial areas may be 4' in width if installed 1' from the property line or 6' in width if installed at the back of the curb. Sidewalks are required on both sides of all arterial, major collector and minor collector streets within and adjoining a subdivision according to the Subdivision Rules and Regulations. In zoning districts "R-1" through "MF-22" and "PD", sidewalks are required on both sides of all local streets.	[Change]: Sidewalks shall be a minimum of 5' in width.	In accordance with ADA standards
Zoning Ordinance	Article 2: Interpretations and Definitions	Street. A public way for vehicular traffic. (Amend Ord 03-052, 4/29/03)	[Add]: Regardless of classification, the design and construction of streets and intersections in the City of Arlington should aim to serve all types of users, including pedestrians, bicyclists, and motorists, and should be inclusive of all levels of ability, such as those in wheelchairs, the elderly and the young.	
Zoning Ordinance	Article 2: Interpretations and Definitions	NA	[Add New Definition] Traffic: Pedestrians and vehicles including bicycles, automobiles and other conveyances either singly or together while using streets for the purposes of travel.	
Zoning Ordinance	Article 2: Interpretations and Definitions	NA	[Add New Definition]: Crosswalks: Shall mean a right-of-way, publicly owned, 10' or more in width, which cuts across a block for the purpose of improving pedestrian access to adjacent streets or properties. The use of traffic calming devices such as raised intersections, lateral shifts, and roundabouts are encouraged as alternatives to conventional traffic control measures with approval of the Planning and Zoning Commission. a pedestrian crosswalk at least 10' in width may be required to provide convenient public access to a public area such as a park, greenway, or school, or to a water area such as a stream, river, or lake. Sidewalks and crosswalks must be ADA compliant and shall be installed in accordance to the Arlington Hike and Bike System Master Plan.	
Zoning Ordinance	Article 2: Interpretations and Definitions	NA	[Add New Definition]: Pedestrian Easements: In such cases and at such locations as the Planning and Zoning Commission deems advisable, easements alongside or near lot lines not exceeding 20' in width may be required for pedestrian or bicycle traffic to and from schools, neighborhood parks, and other places that may attract or generate such traffic.	

City of Arlington Hike & Bike Policy Analysis *(continued)*

Source	Reference	Existing Text	Suggested Change	Notes
Zoning Ordinance	Entire Zoning Ordinance	NA	[Change]: Sidewalks shall be a minimum of 5' in width.	In accordance with ADA
Zoning Ordinance	Article 7: Residential Zoning Districts	NA	[Add Language Throughout Article]: Regardless of district classification, the design and construction of streets and intersections in the City of Arlington should aim to serve all types of users, including pedestrians, bicyclists, and motorists, and should be inclusive of all levels of ability, such as those in wheelchairs, the elderly and the young.	
Zoning Ordinance	Article 8: Non Residential Zoning Districts	NA	[Add Language Throughout Article]: Regardless of district classification, the design and construction of streets and intersections in the City of Arlington should aim to serve all types of users, including pedestrians, bicyclists, and motorists, and should be inclusive of all levels of ability, such as those in wheelchairs, the elderly and the young.	
Zoning Ordinance	Article 9: Special Purpose Districts Section 9-300 Planned Development Districts	Pedestrian Walkways: The subdivision design should provide for pedestrian activity. Sidewalks, crosswalks, trails, and bridges should be provided to separate pedestrian and vehicular traffic. Trails and walkways should be provided in various open space areas connecting to other neighborhoods and community centers.	[Add]: Providing adequate facilities for all types of traffic, including motorists, pedestrians, bicyclists, and transit users, and including all levels of ability, such as those in wheelchairs, the elderly and the young.	
Zoning Ordinance	Article 15: Off Street Parking and Loading Requirements	NA	[Add]: Add requirements for pedestrian circulation in parking lots. Automobile, pedestrian, and bicycle circulation within, to, and from the site, including proposed points of access and egress and proposed pattern of internal circulation. Provide for all types of traffic, including motorists, pedestrians, bicyclists, and transit users, and including of all levels of ability, such as those in wheelchairs, the elderly and the young. Parking lots shall be designed to allow pedestrians to safely move from their vehicles to the building. On small lots (36 spaces or less), this may be achieved by providing a sidewalk at the perimeter of the lot. On larger lots, corridors within the parking area should channel pedestrians from the car to the perimeter of the lot or to the building. These corridors are delineated by a paving material that differs from that of vehicular areas and are planted to provide shade. Small posts or bollards may be included.	In accordance with ADA standards
Zoning Ordinance	Article 15: Off Street Parking and Loading Requirements	NA	Consider adding requirements that parking lots be orientated at the rear or sides of buildings and the buildings be brought closer to the sidewalk and street.	For good examples of this see the City of Davidson, NC and the City of Belmont, NC zoning regulations on parking lots.

City of Arlington Hike & Bike Policy Analysis *(continued)*

Source	Reference	Existing Text	Suggested Change	Notes
Zoning Ordinance	Article 15: Off Street Parking and Loading Requirements Table 15-400	(Lists minimum parking spaces required for specific land uses)	Add bicycle parking requirements for all uses except residential uses smaller than 4 units/building	
Zoning Ordinance	Entire Zoning Ordinance	NA	[Add]: Need to add pedestrian, bicycle, and alternative non-motorized transportation language and guidelines throughout the entire Zoning ordinance. These modes need to be stressed as equally if not more important than automobile provisions and facilities. Sidewalks, bicycle lanes, other pedestrian facilities, and bicycle racks need to be required with all new development and should follow the recommendations and design guidelines set forth in the Arlington Hike and Bike System Master Plan.	
Subdivision Rules and Regulations	Article II Definitions	Street. A public way for vehicular traffic.	[Add]: Regardless of classification, the design and construction of streets and intersections in the City of Arlington should aim to serve all types of users, including pedestrians, bicyclists, and motorists, and should be inclusive of all levels of ability, such as those in wheelchairs, the elderly and the young.	
Subdivision Rules and Regulations	Article II Definitions	NA	[Add New Definition]: Sidewalks: Residential sidewalks shall be a minimum of 5' in width. Sidewalks serving mixed use and commercial areas shall be a minimum of 8' in width (12'–15' is required in front of retail storefronts). Curb ramps should be fully contained within the markings. The design standards for all sidewalks in the Arlington Hike and Bike System Master Plan shall be adhered to for new streets and modifications to existing streets.	
Subdivision Rules and Regulations	Article II Definitions	NA	[Add New Definition] Traffic: Pedestrians and vehicles including bicycles, automobiles and other conveyances either singly or together while using streets for the purposes of travel.	
Subdivision Rules and Regulations	Article II Definitions	NA	[Add New Definition]: Crosswalks: Shall mean a right-of-way, publicly owned, 10' or more in width, which cuts across a block for the purpose of improving pedestrian access to adjacent streets or properties. The use of traffic calming devices such as raised intersections, lateral shifts, and roundabouts are encouraged as alternatives to conventional traffic control measures with approval of the Planning and Zoning Commission. A pedestrian crosswalk at least 10' in width may be required to provide convenient public access to a public area such as a park, greenway, or school, or to a water area such as a stream, river, or lake. Sidewalks and crosswalks must be ADA compliant and shall be installed in accordance to the Arlington Hike and Bike System Master Plan.	
Subdivision Rules and Regulations	Article II Definitions	NA	[Add New Definition]: Pedestrian Easements: In such cases and at such locations as the Planning and Zoning Commission deems advisable, easements alongside or near lot lines not exceeding twenty 20' in width may be required for pedestrian or bicycle traffic to and from schools, neighborhood parks, and other places that may attract or generate such traffic.	

City of Arlington Hike & Bike Policy Analysis *(continued)*

Source	Reference	Existing Text	Suggested Change	Notes
Subdivision Rules and Regulations	Article IV- Street Right Of Way Requirements	NA	[Add]: Regardless of classification, the design and construction of streets and intersections in the City of Arlington should aim to serve all types of users, including pedestrians, bicyclists and motorists, and should be inclusive of all levels of ability, such as those in wheelchairs, the elderly and the young. All pedestrian and bicycle amenities shall follow the Design Guidelines set forth in the Arlington Hike and Bike System Master	
Subdivision Rules and Regulations	Article IV- Street Right Of Way Requirements Section 4.05 Street Layout Requirements-A. Intersections	NA	[Add]: All intersections with an arterial or collector street shall have high visibilty crosswalks, ADA approved curb ramps, and pedestrian count-down signalization.	In accordance with ADA standards
Subdivision Rules and Regulations	Article IV- Street Right Of Way Requirements Section 4.05 Street Layout Requirements-E. Dead End Streets	NA	[Add]: Cul-de-sacs shall have pedestrian and bicycle access cut throughs at the ends to connect to adjacent streets.	
Subdivision Rules and Regulations	Article IV- Street Right Of Way Requirements Section 4.08 Other Access Ways-Sidewalks	NA	[Add]: Any new or substantially improved commercial, institutional, or multi-family projects shall construct a sidewalk along the entire width of the property parallel to the street within the right-of-way. Substantially improved properties shall mean those properties that construct an addition to an existing building that costs over 50% of the assessed value of the existing building. Residential sidewalks shall be a minimum of 5' in width. Sidewalks serving mixed use and commercial areas shall be a minimum of 8' in width (12'-15' is required in front of retail storefronts). Curb ramps should be fully contained within the markings. The design standards for all pedestrian amenities in the Arlington Hike and Bike System Master Plan shall be adhered to for new streets and modifications to existing streets.	In accordance with ADA standards
Subdivision Rules and Regulations	Article IV- Street Right Of Way Requirements Section 4.08 Other Access Ways-Sidewalks	C. Bikeways. Bikeways shall be designed and built in accordance with the American Association of State and Highway Transportation Officials (AASHTO) design standards.	[Change]: C. Bicycle Facilities. Bicycle facilities shall be designed and built in accordance with the American Association of State and Highway Transportation Officials (AASHTO) design standards, the North Central Texas Council of Governments Regional Plan, the Thoroughfare Development Plan, and the Arlington Hike and Bike System Master Plan.	
Subdivision Rules and Regulations	Article IV- Street Right Of Way Requirements Section 4.08 Other Access Ways-Sidewalks	D. Easements. The developer may, at his own option, choose to provide additional private access easements for sidewalks, walkways or bikeways. Construction and maintenance of these private access easements will be the responsibility of the developer and/or subsequent owners.	[Change]: Easements: In such cases and at such locations as the Planning and Zoning Commission deems advisable, easements alongside or near lot lines not exceeding 20' in width may be required for pedestrian or bicycle traffic to and from schools, neighborhood parks, and other places that may attract or generate such traffic. Construction and maintenance of these private access easements will be the responsibility of the developer and/or subsequent owners in accordance with the Arlington Hike and Bike System Master Plan Design Guidelines.	

City of Arlington Hike & Bike Policy Analysis *(continued)*

Source	Reference	Existing Text	Suggested Change	Notes
Subdivision Rules and Regulations	Entire Subdivision Regulation	NA	[Add]: Need to add pedestrian, bicycle, and alternative non-motorized transportation language and guidelines throughout the entire Subdivision Regulation. These modes need to be stressed as equally if not more important than automobile provisions and facilities. Sidewalks, bicycle lanes, and other pedestrian facilities, and bicycle racks need to be required with all new development and should follow the recommendations and design guidelines set forth in the Arlington Hike and Bike System Master Plan.	
Design Criteria Manual	Section 2.1 Definitions	All Definitions of Street Classifications	[Add]: Regardless of classification, the design and construction of streets and intersections in the City of Arlington should aim to serve all types of users, including pedestrians, bicyclists and motorists, and should be inclusive of all levels of ability, such as those in wheelchairs, the elderly and the young.	
Design Criteria Manual	Section 2.1 Definitions	NA	[Add New Definition]: Sidewalks: Residential sidewalks shall be a minimum of 5' in width. Sidewalks serving mixed use and commercial areas shall be a minimum of 8' in width (12'–15' is required in front of retail storefronts). Curb ramps should be fully contained within the markings. The design standards for all pedestrian amenities in the Arlington Hike and Bike System Master Plan shall be adhered to for new streets and modifications to existing streets.	In accordance with ADA standards
Design Criteria Manual	Section 2.1 Definitions	NA	[Add New Definition] Traffic: Pedestrians and vehicles including bicycles, automobiles and other conveyances either singly or together while using streets for the purposes of travel.	
Design Criteria Manual	Section 2.1 Definitions	NA	[Add New Definition]: Crosswalks: Shall mean a right-of-way, publicly owned, 10' or more in width, which cuts across a block for the purpose of improving pedestrian access to adjacent streets or properties. The use of traffic calming devices such as raised intersections, lateral shifts, and roundabouts are encouraged as alternatives to conventional traffic control measures with approval of the Planning and Zoning Commission. A pedestrian crosswalk at least 10' in width may be required to provide convenient public access to a public area such as a park, greenway, or school, or to a water area such as a stream, river, or lake. Sidewalks and crosswalks must be ADA compliant and shall be installed in accordance to the Arlington Hike and Bike System Master Plan.	In accordance with ADA standards
Design Criteria Manual	Section 2.1 Definitions	NA	[Add New Definition]: Pedestrian Easements: In such cases and at such locations as the Planning and Zoning Commission deems advisable, easements alongside or near lot lines not exceeding 20' in width may be required for pedestrian or bicycle traffic to and from schools, neighborhood parks, and other places that may attract or generate such traffic.	

City of Arlington Hike & Bike Policy Analysis *(continued)*

Source	Reference	Existing Text	Suggested Change	Notes
Design Criteria Manual	Section 4.6 Engineering Division/Department of Public Works; Section 5.6 Engineering Division/Department of Public Works; and Section 6.6 Engineering Division/Department of Public Works	Sidewalks shall be placed on both sides of the street within the right-ofway, shall be 4' wide and placed 1' off the right-of-way line. If necessary, sidewalks may be placed closer to the curb, but no closer than 2' except where site restrictions require the sidewalk to be placed closer to the curb. In these cases, the sidewalk shall be adjacent to the curb and shall be 6' in width.	[Change]: Sidewalks shall be a minimum of 5' in width. In accordance with the Arlington Hike and Bike System Master Plan Design Guidelines.	In accordance with ADA standards
Design Criteria Manual	Section 4.6 Engineering Division/Department of Public Works; Section 5.6 Engineering Division/Department of Public Works; and Section 6.6 Engineering Division/Department of Public Works	If obstructions are within the path of a proposed sidewalk, the sidewalk width and placement may be adjusted to allow the obstruction to remain. In these cases, a minimum sidewalk width of 3' shall be maintained.	[Change]: If obstructions are within the path of a proposed sidewalk, the sidewalk width and placement may be adjusted to allow the obstruction to remain. The sidewalk shall be a minimum of 5' in width. In accordance with the Arlington Hike and Bike System Master Plan Design Guidelines.	In accordance with ADA standards
Design Criteria Manual	Section 4.6 Engineering Division/Department of Public Works; Section 5.6 Engineering Division/Department of Public Works; and Section 6.6 Engineering Division/Department of Public Works	Access ramps shall be designed and constructed at all street intersections concurrent with the street construction. Mid-block ramps are required for local streets and at signalized locations.	[Change]: Curb ramps should be fully contained within the markings. The design standards for all pedestrian amenities in the Arlington Hike and Bike System Master Plan shall be adhered to for new streets and modifications to existing streets. Crosswalks: Shall mean a right-of-way, publicly owned, 10' or more in width, which cuts across a block for the purpose of improving pedestrian access to adjacent streets or properties.The use of traffic calming devices such as raised intersections, lateral shifts, and roundabouts are encouraged as alternatives to conventional traffic control measures with approval of the Planning and Zoning Commission. A pedestrian crosswalk at least 10' in width may be required to provide convenient public access to a public area such as a park, greenway, or school, or to a water area such as a stream, river, or lake. Sidewalks and crosswalks must be ADA compliant and shall be installed in accordance to the Arlington Hike	
Design Criteria Manual	APPENDIX J Paving and Drainage Plan Checklist Subdivisions	Throughout Checklist	[Change]: Sidewalks shall be a minimum of 5' in width.	In accordance with ADA standards
Design Criteria Manual	APPENDIX H Intersection Geometric Layouts	Throughout All Drawings	[Change]: Sidewalks shall be a minimum of 5' in width. [Add]: Intersection Design Guidelines found in the Arlington Hike and Bike System Master Plan.	In accordance with ADA standards

City of Arlington Hike & Bike Policy Analysis *(continued)*

Source	Reference	Existing Text	Suggested Change	Notes
Design Criteria Manual	Entire Design Criteria Manual	NA	[Add]: Need to add pedestrian, bicycle and alternative non-motorized transportation language and guidelines throughout the entire Design Criteria Manual. These modes need to be stressed as equally if not more important than automobile provisions and facilities. Sidewalks, bicycle lanes, other pedestrian facilities, and bicycle racks need to be required with all new development and should follow the recommendations and design guidelines set forth in the Arlington Hike and	
Code of Ordinances: Traffic and Motor Vehicles	Article I Definitions	NA	[Add New Definition]: Bicyclist: means a person operating a bicycle.	
Code of Ordinances: Traffic and Motor Vehicles	Article I Definitions	NA	[Add New Definition]: Sidewalk: Shall mean a right-of-way, publicly owned, 5' or more in width which provides pedestrian access along a roadway. The design standards for all pedestrian amenities in the Arlington Hike and Bike System Master Plan shall be adhered to for new streets and modifications to existing streets.	
Code of Ordinances: Traffic and Motor Vehicles	Article I Definitions	NA	[Add New Definition]: Traffic: Pedestrians and vehicles including bicycles, automobiles and other conveyances either singly or together while using streets for the purposes of travel.	
Code of Ordinances: Traffic and Motor Vehicles	Article I Definitions	NA	[Add New Definition]: Crosswalks: Shall mean a right-of-way, publicly owned, 10' or more in width, which cuts across a block for the purpose of improving pedestrian access to adjacent streets or properties. Sidewalks and crosswalks must be ADA compliant and shall be installed in accordance to the Arlington Hike and Bike System Master Plan.	
Code of Ordinances: Traffic and Motor Vehicles	Article I Definitions	NA	[Add New Definition]: Pedestrian Easements: In such cases and at such locations as the Planning and Zoning Commission deems advisable, easements alongside or near lot lines not exceeding 20' in width may be required for pedestrian or bicycle traffic to and from schools, neighborhood parks, and other places that may attract or generate such traffic.	
Code of Ordinances: Traffic and Motor Vehicles	Article II Operation of Vehicles in City; Section 2.13 Bicycle Helmets	NA	[Add]: Add bicycle ordinance and bicycle parking text and change section title to Bicycles	
Code of Ordinances: Traffic and Motor Vehicles	Article II Operation of Vehicles in City; Section 2.13 Bicycle Helmets	It is unlawful for any child to operate or ride upon a bicycle or any side car, trailer, child carrier, seat or other device attached to a bicycle unless the child is wearing a helmet.	[Change}: Consider requiring helmets for ALL bicycle riders regardless of age.	
Code of Ordinances: Traffic and Motor Vehicles	Article V General Parking Requirements	NA	[Add]: Add bicycle parking ordinance text and add section title Bicycle Parking	

C.2 Draft Arlington Comprehensive Plan (2010)

The Arlington Comprehensive Plan, which was being developed during this planning process, will provide goals, guidance, and recommendations for the various planning realms within Arlington. Once adopted, this document will set forth goals, policies and strategies for Arlington to grow and prosper as a 21st century city.

Bicycling and walking are supported throughout the Plan, especially in the Transportation Chapter. Strategies are identified that build upon the existing roadway network, while looking for ways to maintain, enhance and improve mobility for all users.

Below are some key excerpts from Draft Comprehensive Plan that relate to bicycle, pedestrian, and trail issues:

- Roadway Section Goal: *"to provide a safe, efficient, and reliable roadway network that supports a multi-modal transportation system."*

- Roadway Section Policy: *"Educate the public on the benefits of a multi-modal system"*

- Roadway Section Strategy*: "Update the TDP and Design Criteria Manual to incorporate Context Sensitive Design principles"*

- Roadway Section Strategy*: "Incorporate access management standards into all new roadway or reconstruction projects.*

- On-Road Bicycle and Pedestrian System Strategies*:*

    1. *Maintain existing bicycle and pedestrian infrastructure.*

    2. *Implement the adopted Hike and Bike System Master Plan.*

    3. *Identify and pursue funding to implement bicycle and pedestrian projects.*

    4. *Require new developments and redevelopment projects to provide sidewalks and bicycle connections throughout and around the perimeter of their project or preserve right-of-way in accordance with the City's Hike and Bike System Master Plan.*

    5. *Improve existing facilities to meet new standards.*

6. *Increase public awareness of the availability of facilities, benefits, and safety issues related to walking and cycling.*

7. *Support Safe Routes to School initiatives.*

- Trail Section Goal: *Create a safe, efficient pedestrian and bicycle trail network that will connect users to key destinations, provide connections to adjacent cities, provide opportunities for a wide variety of recreational activities, and encourage walking and cycling.*

- Trail Section Policies:

  1. *Maintain and improve the quality and operation of trail facilities.*

  2. *Create a well-connected network of pedestrian and bicycle facilities so as to improve connectivity and access.*

  3. *Provide adequate amenities and end-of-trip facilities for cyclists.*

- Trail Section Strategies:

  1. *Implement recommendations in the adopted Hike and Bike System Master Plan, such as creating a Hike and Bike Advisory Committee, acquiring Bicycle Friendly Community status from the League of American Bicyclists, and creating a user-friendly website and trail maps.*

  2. *Coordinate Arlington's bicycle and pedestrian system with the regional Veloweb Plan and the plans of adjacent cities to maximize regional connectivity.*

  3. *Identify and pursue funding sources to help with implementation of the Master Plan.*

City of Arlington Hike & Bike Policy Analysis

C.3 Bicycle Ordinance (standalone ordinance)

The City of Arlington has bicycle-related ordinance articles found throughout the Code of Ordinances that primarily address bicycle helmet usage. It is recommended that the City of Arlington adopt the following standalone bicycle ordinance that addresses

DRAFT City of Arlington Bicycle Ordinance

ARTICLE 1. GENERAL PROVISIONS.

DEFINITIONS

In this chapter:

1. CHILD means a person younger than 18 years of age.
2. ADULT means any individual eighteen (18) years of age or older.
3. BICYCLE means a human powered vehicle with two (2) wheels in tandem designed to transport by a pedaling action a person seated on a saddle seat.
4. BICYCLIST means a person operating a bicycle.
5. PARENT means the natural or adoptive parent or court-appointed guardian or conservator of a child.
6. HELMET means properly fitted headgear that is not structurally damaged and that conforms to the standards of the American National Standards Institute, the American Society for Testing and Materials, the Snell Memorial Foundation or any federal agency having regulatory jurisdiction over bicycle helmets, as applicable, at the time of the manufacture of the helmet.

APPLICABILITY.

This chapter applies when a person operates a bicycle on a street, sidewalk, or bicycle path.

ARTICLE 2. BICYCLE TRAFFIC REGULATIONS.

APPLICABILITY OF VEHICLE TRAFFIC RULES.

A bicyclist shall comply with the requirements of this title imposed on a driver of a vehicle, to the extent that the requirements may be applied to operation of a bicycle.

OBEDIENCE TO TRAFFIC-CONTROL DEVICES.

1. A bicyclist shall obey the instruction of official traffic signals, signs, and other traffic-control devices applicable to vehicles, unless otherwise directed by a police officer.
2. Unless a bike lane or shared roadway is specifically designated otherwise, a bicyclist riding in a bike lane may not travel in the opposite direction of adjacent motor vehicles in the roadway.
3. A bicyclist shall obey traffic signs that prohibit a right, left, or "U" turn, except when the bicyclist dismounts from the bicycle to make the turn. A bicyclist who dismounts shall obey regulations applicable to pedestrians.

USE OF SIDEWALKS RESTRICTED.

1. No person shall ride a bicycle upon a sidewalk within a business district. A bicyclist shall ride in designated on-street bicycle facilities when available unless there are no designated on-street bicycle facilities in near proximity to the rider. The Director of Public Works and Transportation is

DRAFT City of Arlington Bicycle Ordinance (continued)

authorized to erect signs on any sidewalk or roadway prohibiting the riding of bicycles thereon. Whenever any person is riding a bicycle upon a sidewalk, such person shall yield the right-of-way to any pedestrian, give at least 3 feet of clearance when passing a pedestrian and walk their bicycle when that clearance cannot be allowed, and shall give an audible signal before overtaking and passing such pedestrian.

EXITING FROM ALLEY, DRIVEWAY, OR BUILDING.

A bicyclist exiting from an alley, driveway, or building shall yield the right-of-way to a pedestrian on a sidewalk or sidewalk area, or to a vehicle on a roadway.

PARKING.

1. A person may not park a bicycle
   (a) so that it obstructs vehicle or pedestrian traffic on a roadway, sidewalk, driveway, handicap access ramp, building entrance, or so that it prevents operation of a parking meter or newspaper rack; or
   (b) in a space designated as a vehicle parking place or between two designated vehicle parking places; or
   (c) secured to a fire hydrant or to a police or fire call box.
2. A person may not attach or secure a bicycle to public or private property in a manner that may damage, impair, or render the property unusable.
3. A person may park a bicycle:
   (a) against a street curb;
   (b) in a bicycle rack on a sidewalk; or
   (c) against a building.

RIDING RESTRICTIONS.

1. Except as otherwise directed by a traffic-control device or a police officer, a bicyclist shall ride:
   (a) as near to the right side of the roadway as safe, exercising due care when passing a standing vehicle or one proceeding in the same direction, except when making a left turn, when avoiding hazardous conditions, when the lane is too narrow to share with another vehicle, or when on a one-way street. Bicyclists may ride abreast when not impeding other vehicles;
   (b) in the center of the lane where vehicles are permitted to park along the right curb; or
   (c) in the right-hand portion of an un-laned street.
2. A bicyclist may not ride a bicycle between vehicles traveling or standing in the same direction within marked lanes of a roadway.

RIDING ON RESTRICTED OR PROHIBITED STREETS.

A bicyclist may not ride a bicycle on a street where bicycle riding is prohibited or on a street during the hours that bicycle riding is prohibited on the street.

ARTICLE 3. HARRASSMENT AND PASSING OF A BICYCLIST.

1. A person commits the offense of harassment of a bicyclist if the person:
   (a) knowingly throws an object at or in the direction of any person riding a bicycle; or
   (b) threatens any person riding a bicycle for the purpose of frightening or disturbing the person riding the bicycle; or

DRAFT City of Arlington Bicycle Ordinance (continued)

(c) sounds a horn, shouts or otherwise directs sound toward any person riding a bicycle for the purpose of frightening or disturbing the person riding the bicycle; or

(d) knowingly engages in conduct that creates a risk of death or serious physical injury to the person riding a bicycle.

2. Any motor vehicle passing a bicyclist must allow a clearance of 3 feet from the farthest extent of the vehicle to the bicycle on all roadways.

ARTICLE 4. BICYCLE HELMETS.

HELMET REQUIRED.

1. A child may not operate or ride on a bicycle, sidecar, trailer, child carrier, seat, or other device attached to a bicycle unless the child is wearing a helmet.
2. A parent may not permit a child to operate or ride on a bicycle, sidecar, trailer, child carrier seat, or other device attached to a bicycle unless the child is wearing a helmet.
3. Under this section, a helmet must:

   (a) be properly fitted and securely fastened to the child's head with the straps securely tightened;

   (b) not be structurally damaged; and

   (c) conform to the standards of the American National Standards Institute, the America Society for testing and Materials, the Snell Memorial Foundation, or a federal agency with regulatory jurisdiction over bicycle helmets at the time of the manufacture of the helmet.
4. In no situation can citations be issued to both a parent and a child for a single violation of this ordinance arising out of a single incident.
5. It is a defense to prosecution that the bicycle was not being operated upon a public way at the time of the alleged offense.

APPROVAL OF STANDARDS.

1. The city council approves the bicycle helmet standards promulgated by the American National Standards Institute, the American Society for Testing and Materials, and the Snell Memorial Foundation.

HEALTH CONDITION EXEMPTION.

1. A child is not required to wear a helmet if the child has in its immediate possession a health exemption identification prescribed by this section.
2. The city manager shall provide a health exemption identification to a child with a written statement:

   (a) from a licensed physician that states the child's health condition and explains why th condition prevents the child from wearing a helmet; and
3. The city manager shall establish procedures to implement this section.

CIVIL ACTIONS.

1. The city council adopts this article to encourage bicycle safety through the use of helmets and through the promotion of educational efforts.
2. The city council does not intend this article to be used in a manner to prejudice a person, child, or parent in a civil action arising out of a bicycle accident. The council encourages construction of this article accordingly.

DRAFT City of Arlington Bicycle Ordinance (continued)

ARTICLE 5. PASSENGERS

1. It shall be unlawful to operate a bicycle in the City to carry more persons at one time than the number of persons for which such bicycle was originally designed and equipped.
2. It is a defense to prosecution under this section that the person was in a child carrier, side car or trailer specifically designed and manufactured for the purpose of carrying or pulling a passenger on, beside or behind a bicycle and that such carrier, side car or trailer was equipped with a harness to hold such person securely in the seat and that protection was provided to keep the feet or hands of such person from hitting the spokes of the wheel of the bicycle. In no circumstance shall the operator of a bicycle transport any person under the age of one year on a bicycle.

ARTICLE 6. SALE OR LEASE OF BICYCLES BY DEALERS

1. It shall be unlawful for any dealer to sell a bicycle, bicycle side car, trailer or child carrier without providing a written statement to the purchaser advising of the terms of this Section. The statement shall be in a form promulgated by the Chief of Police. Upon request, the Chief of Police shall provide a sample of the required form to a dealer. However, printing of distribution copies shall be at the dealer's expense.
2. It shall be unlawful for any dealer to lease a bicycle to any person without providing a helmet for the use of each child who will operate or ride upon the bicycle or determining that each child who will operate or ride upon the bicycle has a helmet available. The dealer may impose an additional fee for use of the helmet if the dealer sells or leases a helmet to the bicycle lessee.

ARTICLE 7. PENALTY

1. Any person, firm, corporation, agent or employee thereof who violates any of the provisions of this ordinance shall be guilty of a misdemeanor and upon conviction shall be fined an amount not less than One Dollar ($1) nor more than One Hundred Dollars ($100).
   (a) On conviction of any person for a first offense under this section the court shall suspend execution of sentence and shall require the defendant to attend a bicycle safety course approved by the court. The court may require the parent of any child convicted under this section to attend the bicycle safety course with the child.
   (b) Not later than the 90th day after the date of a conviction under this section, the defendant shall present to the court, in the manner required by the court, evidence of satisfactory completion of a bicycle safety course.
   (c) On receipt of the evidence required under subsection (2)(b) the court shall discharge the defendant and dismiss the complaint against the defendant. The defendant would then be released from all penalties involved with the ordinance except that the defendant is considered to have been convicted of the offense if the defendant is subsequently convicted of an offense under this section committed after the dismissal of the first offense.
2. Each fiscal year an amount shall be designated from the general fund for the continuation, development or implementation of a bicycle safety program. That amount shall be equal to or greater than the amount of fines collected the previous year for any violations of this section.

(Amend Ord 97-140, 10/14/97)

additional, new issues and ideas such as riding on the sidewalk and motorist harassment of bicyclists. Numerous cities (Austin, TX, Fort Worth, TX, Columbia, MO, and Portland, OR) were researched to support the following recommended ordinance:

City of Arlington Bicycle Parking Ordinance

PURPOSE:

Bicycle parking encourages shoppers, customers, employees, messengers, and other visitors to use bicycles by providing a convenient and readily accessible place to park bicycles. Bicycle parking should serve the main entrance of a building or other facilities like pools, parks, etc., and should be visible to pedestrians and bicyclists.

LOCATION:

- Bike rack placement should not obstruct pedestrian or wheelchair movement along sidewalk, at bus stops, or at corners.
- Where possible, bike racks shall be located in well-lighted and highly visible areas in order to minimize theft and vandalism.
- Bicycle parking should be clearly marked as such.
- Avoid installation of bicycle racks inside designated loading/unloading, passenger, and pedestrian zones.
- For schools, retail, public buildings, and commercial uses it is recommended that half of the bicycle parking spaces be provided as long term parking, safe and secure from vandalism and theft, and protected from the elements.
- Bicycle racks should be at the same grade as the sidewalk or at a location that can be reached by an accessible route.
- Bicycle racks should be within 50 feet of the main entrance to the building as measured along the most direct pedestrian access route, for a building with more than one main entrance, bicycle racks should be placed at each main entrance.
- If the bicycle parking is more than 50 feet from a main entrance, it should be in a central location preferably along a pedestrian route.
- When a bike is parked at a rack there should be no less than 2 feet from the curb and 30 inches from any permanent object to allow for adequate maneuvering space for the bicyclist and for motorists accessing parked vehicles.
- There should be a desirable minimum of 6 feet or an absolute minimum of 4 feet for a clear pedestrian zone.
- There should be at least 2 feet of clearance beside each parked bicycle when installing multiple racks.
- Places of employment shall install bicycle parking inside the building structure for employees equivalent to the number of bicycle racks required outside the building structure.
- See drawings for more detail

City of Arlington Bicycle Parking Ordinance (continued)

AMOUNT OF BICYCLE PARKING:
Note: The amount of bike parking means the number of bicycles accommodated not the amount of bike racks installed.

Land Use:	Recommended Parking:
Multi-family	10% of all automobile spaces
Hotels/Motels	1 per 3 rooms
Schools/College	K-12: 1 per 10 students; college: 1 per 10 autos
Commercial and Retail-W/Off Street Parking	5% of all automobile spaces with a minimum of 2 and an optional 1 per 4 employees
Commercial and Retail-W/On Street Parking	1 per 5000 Sq feet of building with a minimum of 2 and an optional 1 per 4 employees
Governmental Institutions (Library, Medical Center, Court, Post Office, Civic Hall, Community Center, etc.)	1 per 10,000 Sq feet of building with a minimum of 2
Industrial	5% of all automobile spaces with a minimum of 2
Recreation	10% of all automobile spaces

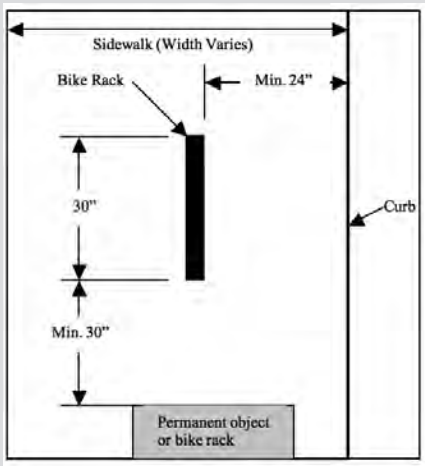
SUGGESTED EQUIVALENCY RATIO:

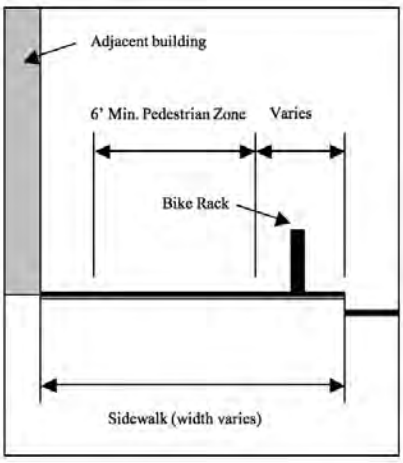
Required automobile parking spaces may be reduced at the ratio of one (1) automobile parking space (8′ x 17′) for six (6) bicycle parking spaces.

TYPES, SIZES, AND PLACEMENT OF RECOMMENDED BIKE RACKS:

- U racks accommodate 2 bicycles and measure approximately 34″ (L) x 6″ (W) x 36″ (H)

- Typical placement for inverted "U" bike racks





C.4 Bicycle Parking Ordinance

Bicycle parking is critical to provide placement of bicycles at end-of-trips. The following is a recommended bicycle parking ordinance for the City of Arlington that addresses proper placement, amount, and types of bicycle parking.

C.5 Existing Federal and State Policies

Current Federal Policies

As of December 2009, the *Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users* (SAFETEA-LU), a major bill funding federal transportation programs, is up for reauthorization. Speaking on this reauthorization, US Department of Transportation Secretary Ray LaHood has expressed his desire to see significant changes to federal transportation policy. His priorities include emphasizing livability and sustainability in all transportation projects. He has also noted that bicycle and pedestrian transportation are key elements to these goals. Additionally, he has been quoted saying "the right of way doesn't just belong to cars — it belongs to pedestrians and bicyclists as well." Adopting a national Complete Streets policy has gained momentum and will likely be part of this reauthorization bill. Therefore, bicycling and walking continues to gather strong support as the country realizes their importance for physical health and transportation.

The current U.S. Department of Transportation's policies on bicycling and walking are:

1. Bicycle and pedestrian ways shall be established in new construction and reconstruction projects in all urbanized areas unless one or more of three conditions are met:

- Bicyclists and pedestrians are prohibited by law from using the roadway. In this instance, a greater effort may be necessary to accommodate bicyclists and pedestrians elsewhere within the right of way or within the same transportation corridor.
- The cost of establishing bikeways or walkways would be excessively disproportionate to the need or probable use. Excessively disproportionate is defined as exceeding twenty percent of the cost of the larger transportation project.
- Where sparsity of population or other factors indicate an absence of need. For example, the Portland Pedestrian Guide requires "all construction of new public streets" to include sidewalk improvements on both sides, unless the street is a cul-de-sac with four or fewer dwellings or the street has severe topographic or natural resource constraints.

2. In rural areas, paved shoulders should be included in all new construction and reconstruction projects on roadways used by

more than 1,000 vehicles per day, as in states such as Wisconsin. Paved shoulders have safety and operational advantages for all road users in addition to providing a place for bicyclists and pedestrians to operate.

Rumble strips are not recommended where shoulders are used by bicyclists unless there is a minimum clear path of four feet in which a bicycle may safely operate.

3. Sidewalks, shared use paths, street crossings (including over- and undercrossings), pedestrian signals, signs, street furniture, transit stops and facilities, and all connecting pathways shall be designed, constructed, operated and maintained so that all pedestrians, including people with disabilities, can travel safely and independently.

4. The design and development of the transportation infrastructure shall improve conditions for bicycling and walking through the following additional steps:

- Planning projects for the long-term. Transportation projects are long-term investments that remain in place for many years. The design and construction of new projects that meet the criteria in item 1) above should anticipate likely future demand for bicycling and walking and not preclude the provision of future improvements. For example, a bridge that is likely to remain in place for 50 years, might be built with sufficient width for safe bicycle and pedestrian use in anticipation that connecting bicycle facilities or sidewalks will be available at either end of the bridge even if that is not currently the case.

- Addressing the need for bicyclists and pedestrians to cross corridors as well as travel along them. Even where bicyclists and pedestrians may not commonly use a particular travel corridor that is being improved or constructed, they will likely need to be able to cross that corridor safely and conveniently. Therefore, the design of intersections and interchanges shall accommodate bicyclists and pedestrians in a manner that is safe, accessible and convenient.

- Getting exceptions approved at a senior level. Exceptions for the non-inclusion of bikeways and walkways shall be approved by a senior manager and be documented with supporting data that indicates the basis for the decision.

- Designing projects to the best currently available standards and guidelines. The design of improvements for bicyclists and pedestrians should follow design guidelines and standards that are commonly used, such as the AASHTO *Guide for the Development of Bicycle Facilities*, AASHTO's *A Policy on Geometric Design of Highways and Streets*, and the ITE

Recommended Practice "*Design and Safety of Pedestrian Facilities*".

Federal and State- Safe Routes to School Policies

The Safe Routes to School (SRTS) programs make walking and biking to school safer and more appealing to children, including those with disabilities. SRTS projects and activities reduce traffic, fuel consumption and air pollution near primary and middle schools (grades K-8).

SRTS, contained in the 2005 federal transportation bill SAFETEA-LU, provides a healthy alternative to riding the bus or being driven to school. Each state receives funding based on its percentage of the national total of children in grades K-8. Texas received $44,684,980 in SRTS funding between 2005 and 2009. In addition to federal funds, state law dedicates revenue from the God Bless Texas and God Bless America specialty license plates to the Safe Routes to School Program.

Below are a few recent State of Texas policy and legislative changes that benefit the Safe Routes to School program and goals:

Matthew Brown Act

The Texas Legislature passed the Matthew Brown Act in 2001 and laid the foundation for the state Safe Routes to School infrastructure program. Twenty-seven awards were given in a 2003 call for infrastructure projects. The lessons learned from that pilot program helped establish the current TxDOT Safe Routes to School program.

Wellness

In 2003 and 2007 the Texas Legislature passed bills that require 30 minutes per day of physical activity for K-8.

Curriculum

In 1993 the Texas Legislature passed a bill requiring the Texas Department of Public Safety (DPS) to develop a bicycle safety curriculum. The SuperCyclist curriculum was developed in partnership with the Texas Bicycle Coalition Education Fund.

Below are some additional recommended State of Texas policy changes to aid the Safe Routes to School program and goals:

Complete Streets

The planning, design, construction, and maintenance of all roadway and transit facilities, as well as developments and new schools, should consider and include the needs of bicyclists and pedestrians from the inception of the project.

School Bus Cuts

School districts all across the country are struggling to

balance budgets and save money. When school districts face financial challenges, a common target for cuts are the school transportation system by cutting back bus routes, trimming the number of bus stops, or widening the walk radius around a school.

School Siting

Only about 35% of students in the United States live within two miles of their school. Statewide policies on school siting, acreage requirements, joint-use, and renovations can profoundly impact the percentage of students who live within walking or bicycling distance of their school.

State Policies (TxDOT)

To date, Texas does not have a Complete Streets policy, but the Texas Department of Transportation (TxDOT) does consider bicycling and walking as important modes of transportation. TxDOT has created several manuals that specify specific policies regarding bicycle and pedestrian planning and development. These manuals include, but are not limited to, the *Project Development Process Manual (Chapter 5, Section 4 Roadway Design), Landscape and Aesthetics Design Manual, (Chapter 3, Section 4 Design Bicyclist and Pedestrian Facilities and Chapter 4, Section 10 Bicycle and Pedestrian Access), and the Roadway Design Manual (Chapter 6, Section 4 Bicycle Facilities).*

A few excerpts from these manuals are below:

- Designers of *any* type of transportation improvement should consider the need for bicyclist and pedestrian accommodations. Designs must consider these legitimate forms of travel so that safety of all travelers is maximized. (*Project Development Process Manual)*

- TxDOT guidance states that when any of the following factors are present, sidewalks should be included on a project:

    - Facility is part of a locally adopted sidewalk planning document;
    - There is evidence of pedestrian traffic (either pedestrians are observed, there is a beaten path, or significant potential exists for pedestrians to walk in the roadway); or
    - Facility is located on a route to a school or a transit route.
    - In addition, where pedestrian generators/attractors exist, new sidewalk construction may be considered.
    - *All* pedestrian facilities must be designed according to the Americans with Disabilities Act Accessibility Guidelines (ADAAG) and the Texas Accessibility Standards (TAS). (*Project Development Process Manual)*

- If the minimum requirements stated in the *AASHTO Guide*

for the Development of Bicycle Facilities for bicycle lanes cannot be met, these variances will be submitted as design exceptions to the Roadway Design Exception Committee. For new shared lanes on a signed, designated bicycle route, the minimum lane width shall be 14 ft [4.2 m]. Proposed widths less than 14 ft [4.2 m] will require approval by the Roadway Design Exception Committee. (Roadway Design Manual)

- If the minimum requirements given in the *AASHTO Guide for the Development of Bicycle Facilities* for bicycle paths cannot be met, these variances will be handled by design waivers at the district level. (Roadway Design Manual)

See each manual for more policy specifics.

State of Texas – Context Sensitive Solutions
"Texas Moves Toward Creating Streets for People"
The Texas Department of Transportation became the first state DOT to adopt the *Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities*, written by the Institute of Transportation Engineers and the Congress for the New Urbanism in cooperation with the Federal Highway Administration and the Environmental Protection Agency. The document provides guidance in creating streets for all users that are consistent with the surrounding community. The result should be more and better sidewalks, more appropriate vehicle speeds, safer and more frequent pedestrian crossings, landscaping and stormwater management, and safer intersections - complete streets. This decision of TxDOT shows how we are moving towards "sustainable development patterns, rather than just mitigating traffic congestion."

Regional Policies (North Central Texas Council of Governments)
The North Central Texas Council of Governments has a Bicycle and Pedestrian Transportation program that was established in 1992 to address the various activities related to implementing bicycle and pedestrian projects as an alternative mode of regional transportation within the region.

The Mobility 2030 Plan contains a Bicycle and Pedestrian Chapter which details, in depth, various regional policies. One of the key focus areas is the development of the regional Veloweb system. A recommended policy is:

"To ensure the adequate attention to the funding needs of the Veloweb, it may be necessary to ensure local project selection under the Statewide Transportation Enhancement Program (STEP)."

Many states already allow Metropolitan Planning Organizations (MPOs) to select projects. Thus, this Plan supports a change in state policy to ensure MPO selection of transportation enhancement

C.6 Complete Streets Policy

Over 125 government agencies nationwide have adopted a Complete Streets policy to support the intent to change the burden of proof so that building sidewalks and bikeways becomes standard practice, instead of the present practice of demonstrating a need to build sidewalks and bikeways. Changing the burden of proof means that more sidewalks and bikeways will be built. It means they will be built at a steady pace, as government funds are invested at specific intersections, in districts, and along corridors. It means that citizens will begin seeing continuous, interconnected networks of safe opportunities for hiking and biking.

Recommended Complete Streets Policy

Sidewalks and bikeways are currently built in Arlington as special projects when justifiable by a demonstrated need, based on observations of pedestrians or bicyclists and only when space within the right-of-way and budgeted funds are sufficient. Over a period of time, the outcome of the established practice is a limited, disconnected patchwork of bicycle and pedestrian opportunities.

A recommendation of this Plan is for the Arlington City Council to adopt a resolution, then an ordinance adopting a Complete Streets Policy. The policy would establish the expectation by City Council that local, state and federal government funds spent to build and repair intersections and streets in Arlington will always consider the needs of pedestrians and bicyclists of all ages and abilities as facilities are designed and redesigned. The policy should have each of the following elements:

- Vision statement
- Includes all modes of travel
- Emphasizes connectivity
- Applies to all transportation projects and phases
- Specifies and limits exceptions to the policy, with management approval required
- Uses latest design standards and flexibility
- Is context-sensitive
- Sets performance measures
- Includes implementation steps

Recommended Complete Streets Text for a Resolution to City Council

RESOLUTION NO. _____

A Resolution of the Arlington City Council Expressing Support for the Complete Streets Concept and Requesting that a Complete Streets Ordinance be drafted as a component of the Thoroughfare Development Plan, Street Design Criteria Manual, and the Hike & Bike Plan.

WHEREAS, the "Complete Streets" concept promotes streets that are safe and convenient for all users including pedestrians, bicyclists, and transit riders;

WHEREAS, streets constitute a large portion of the public space and should be corridors for all modes of transportation including pedestrians, bicyclists, and transit riders;

Streets that support and invite multiple uses that include safe, active and ample space for pedestrians, bicycles, and transit are more conducive to the efficient movement of people than streets designed primarily to move automobiles and trucks;

WHEREAS, trends in public health, energy and transportation costs, and air quality necessitate a more comprehensive approach to mobility within communities to offer a greater variety of mobility choices that are not strictly automobile based;

WHEREAS, there are practical limits to roadway expansion as a response to traffic congestion;

WHEREAS, promoting pedestrian, bicycle and transit travel as an alternative to automobiles promotes healthy living, is less costly to the commuter, may delay the need to widen some streets, and reduces negative environmental impacts;

WHEREAS, the development of a more complete transportation network or "Complete Streets" can improve pedestrian safety, facilitate improvements in public health, increase the transportation network's capacity, and reduce climate change effects;

WHEREAS, the Federal Highway Administration has confirmed that designing streets with pedestrians in mind significantly reduces pedestrian risk. About one-third of Americans do not drive, including low-wealth Americans who cannot afford cars, school-age children, and an increasing number of older adults. Whether they walk or bicycle directly to their destinations, or to public transportation, these individuals require safe access to get to work, school, shops and medical visits, and to take part in social, civic and volunteer activities. In 2008, one fifth of pedestrian fatalities in Texas were children (nine percent) age 15 and under, and older adults (eleven percent) age 65 and older. More than ninety percent of all pedestrian fatalities in Texas in 2008 occurred away from intersections;

WHEREAS, obesity threatens the healthy future of of one-third of all American children. For the first time in American history, our children's life expectancy may be shorter than their parents;

WHEREAS, forty percent of American adults age fifty and older reported inadequate sidewalks in their neighborhoods. Nearly fifty percent reported they cannot cross main roads close to their home safely. Half of those who reported such problems said they would walk, bicycle, or take the bus more according to a 2008 American Association of Retired Persons (AARP) study;

WHEREAS, transportation expenses can be reduced if local infrastructure encourages active transportation, which helps families replace car trips with bicycling, walking, or

taking public transit. When roads are re-designed and maintained to attract pedestrians, the local economy improves and diversifies from increased buyers, which creates job growth and increased investment in the area, including surrounding property values;

WHEREAS, studies have found that providing more travel options, including public transportation, bicycling and walking facilities, is an important element in reducing congestion. When roads are better designed for bicycling, walking, and taking transit, more people do so;

WHEREAS, the construction of "Complete Streets" can be an essential component in reducing automobile trips since nearly fifty percent of all trips in metropolitan areas are three miles or less and twenty-eight percent are one mile or less – distances easily covered by foot or bicycle. Sixty-five percent of trips under one mile are now made by automobile, in part because of incomplete streets that make it dangerous or unpleasant to walk, bicycle, or take transit;

WHEREAS, other jurisdictions and agencies nationwide have adopted "Complete Streets" legislation, including the United States Department of Transportation, numerous state transportation agencies including Florida, regions including the Capitol Area (Austin) Metropolitan Planning Organization (MPO) and the San Antonio-Bexar County MPO, and cities such as North Little Rock, Miami, Chicago, San Diego, and Seattle;

WHEREAS, the "Complete Streets" concept is supported by the Institute of Traffic Engineers, American Planning Association and the National Association of Local Boards of Health many other transportation, planning and public health professionals; and

WHEREAS, the City Of Arlington strives to be a regional leader in First Lady Michelle Obama's "Let's Move" program encouraging our youth to increase their daily physical activity.

NOW, THEREFORE, BE IT RESOLVED by the Arlington City Council that the Arlington City Council requests that staff partner with community organizations and assess current street standards and land use and transportation plans with regard to the "Complete Streets" concept; identify relevant elements within the City's existing plans, regulations and operational standards that support the implementation of "Complete Streets" within the City; and identify the gaps and opportunities to supplement and fund said plans, regulations and standards in order to achieve the implementation of "Complete Streets" throughout the City and provide Council with guidance towards the creation of a "Complete Streets" ordinance.

ADOPTED BY THE CITY COUNCIL ON _____, 2010.

_____
City Clerk

Approved as to form:

_____
Assistant City Attorney

D. FUNDING RESOURCES

Appendix Contents

Overview

Federal Funding Sources

State Funding Sources

Nonprofit/Volunteer Groups

Local Funding Sources

Overview

Implementing the proposed recommendations of the Arlington Hike and Bike System Master Plan will require a strong level of local support and commitment to obtain funding through a combination of federal, state, local, and private sources.

To implement the Arlington Hike and Bike System Master Plan, it will be critical that the integration of bicycle and pedestrian considerations be included with the City of Arlington's mission, plans, policies, processes, and improvement projects. The intent is to change bicycling and walking in the City of Arlington from being perceived as "alternative" activities to being treated as "mainstream" activities by including them in documents used by decision-makers within the community. Every community differs and can find unique and effective ways to successfully accomplish pedestrian and bicycle improvements.

Competition is often very strong for state and federal funds, so it becomes critical that local governments work together to create partnerships to build pedestrian and bicycle improvement projects that are meaningful. Often, the long term success of a master plan is based on the communities' dedication of a local revenue stream for bicycle and greenway projects. It will be important that the City of Arlington fully evaluate all of its options and develop a funding strategy that can meet the community's needs.

The following section describes specific funding sources and strategies that can be used to support and construct the Arlington Hike and Bike System Master Plan recommendations. Creative planning and monitoring of funding options can potentially create new opportunities for additional funding sources that may not be included in this document. The City should strive to implement projects with high visibility to show local commitment and to build future momentum. The City should evaluate and set priorities to make hike and bike improvements. Priorities are usually opportunities associated with roadway improvement projects, schools, parks, urban centers, and neighborhoods that provide connectivity within the City and the surrounding communities.

Federal Funding Sources

The National Transportation Enhancements Clearinghouse has prepared a useful Technical Brief: *Financing and Funding for Trails*, which cites over thirty federal and national funding sources that could be used to help fund bicycling and walking improvements and/or programs, particularly trails. It is noted that prior to 1992, only a few million dollars per year of federal funds were being invested in bicycle or pedestrian facilities. While the energy crisis in 1970's spawned new interest in bicycle planning, very little money from government or non-government sources was invested in bicycle and pedestrian facilities. Throughout the 1970's and into 1980's, the greatest amount of funding for bicycling and walking were invested by state and local parks agencies building multi-use trails; levels of investment were very small compared to what they are today.

Starting in 1992 with the passage of ISTEA (the Intermodal Surface Transportation Efficiency Act), over $3 billion has been invested in bicycle and pedestrian projects, planning, safety, and promotion programs across the nation. Federal and state requirements for cost-sharing have brought state agencies, local governments, non-profit groups and private foundations fully into the funding stream. The growth in public funding at all levels of government has been tremendous since 1992. Park departments, health departments, land management agencies, schools, and law enforcement agencies are spending funds on bicycle and pedestrian-related activities. Foundations and other not-for-profit organizations are increasingly investing their resources into bicycle and pedestrian safety and promotion activities.

Today, some of the more frequently utilized federal programs used to improve pedestrian and bicycle access include:

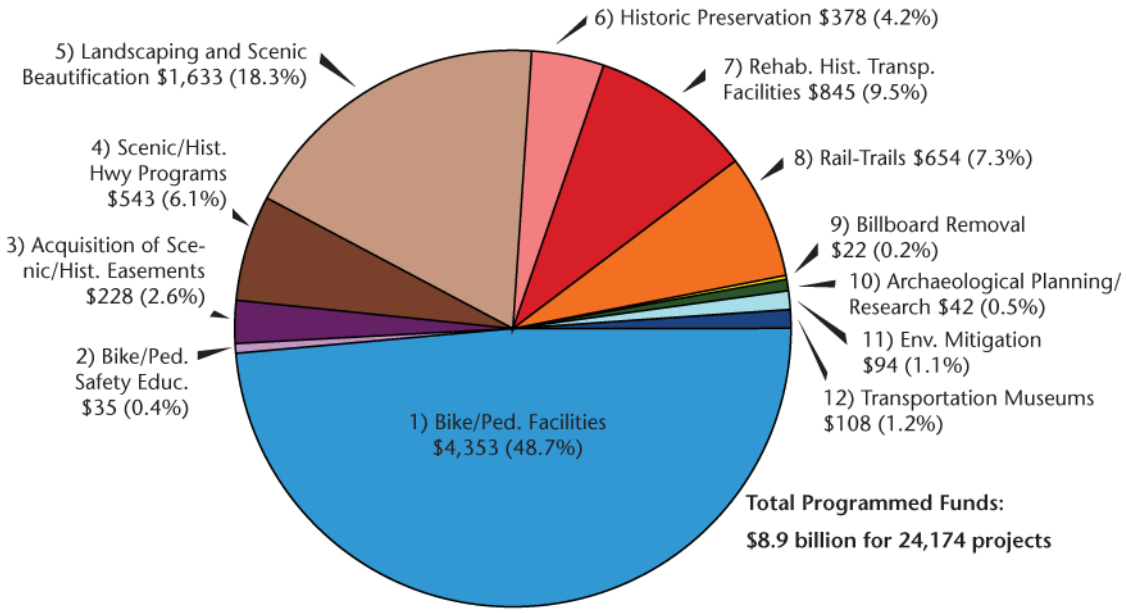
Transportation Enhancement (TE) Program

The Transportation Enhancement (TE) Program is administered by the Texas Department of Transportation (TxDOT). Transportation enhancement projects fall under 12 different categories, which include projects such as pedestrian and bike facilities (including bike trails), conversion of abandoned rail corridors into trails, and acquisition of scenic vistas. All projects must be related, in some way, to transportation. In each state, regional coordinators recommend projects be approved at the state level. TE projects are considered Federal-aid reimbursement activities, which means that sponsors receive funding after expenditures have been made. The federal government provides 80 percent of the funds, and the municipalities need to contribute a 20 percent match. The federal government gives final approval to the projects and distributes the funds directly to the municipalities or nonprofits. The TE program funds transportation-related activities contributing to quality communities, preserving the environment, encouraging multimodal travel, and enhancing the aesthetics of roadways. More Information is available at www.enhancements.org.

The American Recovery and Reinvestment Act of 2009 (ARRA)

The ARRA was signed into law by President Obama on February 17, 2009. It is an unprecedented effort to jumpstart our economy, create or save millions of jobs, and place a down payment on addressing long-neglected challenges so our country can thrive in the 21st century.

The AARA includes measures to modernize our nation's infrastructure, enhance energy independence, expand educational opportunities, preserve and improve affordable health care, provide tax relief, and protect those in greatest need. Through the U.S. Department of Transportation, up to $1.5 billion in ARRA funding is avail-



Project Count for Each Category:

1	2	3	4	5	6	7	8	9	10	11	12
12,186	199	369	1,018	5,127	1,180	1,969	1,274	62	190	353	247

Distribution of Federal Funds by TE Activity FY 1992 through FY 2008 (Federal funds in millions) (Above)

able nationally through September 30, 2011, for the Transportation Investment Generating Economic Recovery (TIGER) Discretionary Grant Program. Funding will be awarded on a competitive basis to state and local governments for capital transportation investments that will have a significant impact on the nation, a metropolitan area, or a region.

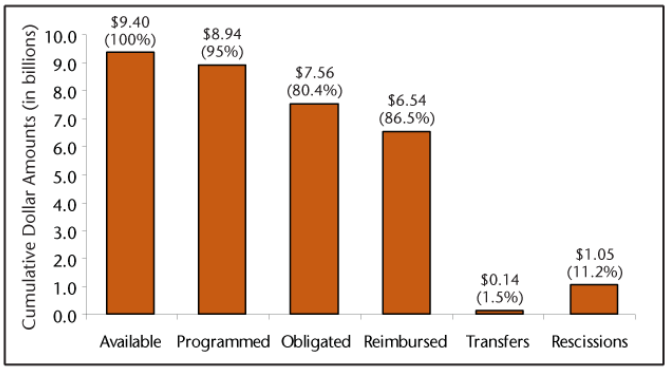
SAFE, ACCOUNTABLE, FLEXIBLE, EFFICIENT, TRANSPORTATION EQUITY ACT (SAFETEA-LU)

(U.S. Department of Transportation Federal Highway Administration)

This program was the successor to TEA-21, the Transportation Equity Act for the 21st Century (1998), which was the successor to the Intermodal Surface Transportation Efficiency Act (ISTEA) in 1992. ISTEA is now viewed as the Federal Act that initiated a major policy shift in federal funding priorities making federal funds much more accessible for state and local bicycling and walking facilities and programs. SAFETEA-LU continues and strengthens this new emphasis on improving conditions for bicycling and walking.

The SAFETEA-LU bill is a six-year funding bill signed into law on August 10, 2005 to current. Funding will be available for obligation until September 30, 2012. Features of the bill include:

- Authorization of $244.1 billion in federal gas-tax revenue and other federal funds for all modes of surface transportation.
- Includes highways, bus, rail transit, bicycling, and walking.
- Funds can be dedicated for solely for bicycle or pedestrian facilities or programs.
- $85,000,000 has been authorized for the recreational trail program for fiscal year 2009.



Cumulative Transportation Enhancements Financial Summary FY 1992 through FY 2008

Recreational Trails Program (RTP)

The reauthorization of the RTP was incorporated into SAFETEA-LU program since its inception. This 5-year program will have distributed a total of $370 million nationwide, an increase of $100 million over TEA-21. During the life of SAFETEA-LU program, it is anticipated that over $3 million will be available for distribution in Texas each year. The RTP application, administered by Texas Park Wildlife Department (TPWD), are due June 15 of each year. Thirty percent of the program funds must be spent for non-motorized trails, 30 percent for motorized trails, and the remaining 40 percent can be allocated for either option. New to SAFETEA-LU is a strong emphasis on trail construction. Funds can be spent to construct new recreational trails, improve or maintain existing trails, develop or improve trailheads or trailside facilities, install signage, purchase trail tools, and acquire trail corridors or easements. Currently, reimbursements from this program may range between $5,000 and $100,000, though the limits may be increased by TPWD in the future. Federal guidelines allow RTP-funded trails to receive up to an 80 percent funding match, and other federal agencies, such as the Army Corps of Engineers, can raise the total federal share to 95 percent. Allowable costs for the sponsor's match can include appraised value of donated land or easement, service contracts, volunteer labor, materials, rental equipment, or money. Most funds are awarded to soft-surface trails.

Trails can be on public or private lands. However, to receive funding for trails on private lands, the sponsor must obtain a legally-binding easement, lease, or license satisfactory to TPWD, and keep the trail open to the public for a minimum of twenty (20) years. Trails on private lands cannot be managed as a commercial enterprise. Development of urban trail linkages near homes and workplaces, including trail links to schools, parks, and existing trails, must be used for recreational purposes. A trail less than one-half mile long is eligible only if interpretation or disabled access is its primary recreational purpose. Trails or walkways to connect facilities within parks are not eligible. Trail restoration or rehabilitation includes rerouting or repair of areas damaged by trail use, flooding, or erosion. Eligible facilities include signs and displays, restrooms, parking areas, drinking water, horse-watering facilities, hitching posts / corrals, bike racks, benches, fencing, and bollards. Ineligible facilities include those that support other recreation activities, landscaping, or buildings. For additional Recreational Trails Program information, contact Trey Cooksey, State Parks Trails Coordinator at 512 / 389-8743 or email at trey.cooksey@tpwd.state.tx.us

Safe Routes to School (SRTS)

The SRTS is managed by TxDOT. SRTS is a program funded through the U.S. Department of Transportation's Federal Highway Administration (FHWA). The program was established under SAFETEA-LU. The SRTS program focuses on incorporating the 5 "E's": engineering, education, encouragement, enforcement, and evaluation, to promote a healthy lifestyle and safe environment near schools.

TxDOT received $40 million to allocate between 2005 and 2009 to facilitate the planning, development, and implementation of projects that encourage walking and bicycling to and from school. In 2007, the first SRTS projects awarded $24.8 million to Texas school districts. In 2009, the TxDOT announced its second round for the SRTS program in the Texas Register. Approved SRTS funding allocation for 2009 was $13,500,000. The timing of the next call for funding will be determined after this cycle is completed. There are three different types of applications: Non-Infrastructure Plan Implementation, Non-Infrastructure Statewide Services, and Infrastructure Projects. The Non-Infrastructure and Infrastructure applications require that a SRTS Plan be submitted for consideration of funding.

The TxDOT SRTS State Coordinator and regional SRTS staff have hosted dozens of meetings around the state to explain the new SRTS application process. Grantees are required to complete evaluation and scoring forms with each application. Texas also utilizes the Texas Transportation Institute to formally evaluate the success of the program. To learn more about SRTS, visit the links below for more information:

- Sample Plan http://www.txdot.gov/safety/safe_routes/information.htm
- 2007 Texas Transportation Commission Approved Funding Letter http://www.nctcog.org/trans/sustdev/landuse/funding/2007ApprovedFundingLetter.pdf
- 2007 Texas Transportation Commission Funded Projects http://www.nctcog.org/trans/sustdev/landuse/funding/2007ApprovedFundingLetter.pdf

Texas's SRTS funding from FY2005-2009 totaled $44,751,640. SRTS is being continued into FY2010 at FY2009 levels.

Congestion Mitigation and Air Quality (CMAQ) Improvement Program

CMAQ funds are competitively awarded through the North Central Texas Council of Governments (NCTCOG) utilizing SAFETEA-LU funds. Since 2001, the NCTCOG SAFETEA-LU CMAQ program in the EPA-designated DFW Metropolitan Management Area (for air quality non-attainment) is the Sustainable Development Joint Venture program. Projects must be located in a designated 'Ozone Non-Attainment Area'. The Mobility 2030- 2009 Amendment is the Dallas – Fort Worth region's vision for transportation systems and services in the Dallas-Fort Worth Metropolitan Area. Mobility 2030: The Metropolitan Transportation Plan for the Dallas-Fort Worth Area, 2009 Amendment was adopted in 2009 to meet air quality requirements. It also outlines the expenditure of nearly $71 billion of federal, state, and local funds expected to be available for transportation improvements through 2030. The amendment details the goals, responsibilities, and activities of the Bicycle and Pedestrian program by setting strategies for providing "effective, cost efficient, safe intermodal access for bicyclists and pedestrians." Sustainable development leverages the land use / transportation relationship to improve mobility, enhance air quality, support economic growth, and ensure the financial stability of the transportation system. For more information on CMAQ-funded programs go to: nctcog.org/trans.

Highway Safety Improvement Program (HSIP)

This new program replaces the Safety Set-aside program and provided $5 billion nationally between 2006-2009. Nearly one percent of these funds are anticipated to go toward bicycle and pedestrian projects. The detailed definition of "highway safety improvement projects" includes improvements for pedestrian or bicyclist safety, construction of traffic calming features, and installation and maintenance of fluorescent yellow-green pedestrian / bicycle crossing warning signs.

Other Federal Funding Sources

There is a wide range of other federal funds that can be used for bicycling and walking projects.

Land & Water Conservation Fund (LWCF) Stateside

The Land and Water Conservation Fund (LWCF) was established by Congress in 1965. The Act designated that a portion of receipts from offshore oil and gas leases be placed annually into a fund for state and local conservation, as well as for the protection of our national treasures (parks, forest and wildlife areas). LWCF is authorized at $900 million annually, a level that has been met only twice during the program's 40-year history. The program is divided into two distinct funding categories: state grants and federal acquisition funds.

The LWCF provides grants to the states to use for land protection. It provides a 50% match to states for planning, developing and acquiring land and water areas for natural resource protection and recreation enhancement. Annual appropriations to the Fund have ranged from a high of $369 million in 1979 to four years of zero funding between 1996 and 1999. Beginning in 2000, the Fund has experienced a significant increase in appropriations for state and local grants with $40 million in FY 2000, almost $89 million in FY 2001, $140 million in FY 2002, and $95 million for FY 2003. Funds are distributed to states based on population and need.

The "stateside" of LWCF is distributed to all 50 states, DC and the territories by a formula based on population among other factors. Once the funds are distributed to the states, it is up to

each state to choose the projects, though the National Park Service has final approval.

Under stateside, a project must fit into a state's recreation plan, furthering its goals on recreation and open space. Usually each state has a ranking system that determines how grant funds will be spent. State grant funds can also be used for park development and for acquisition of lands and easements. State park directors solicit communities to apply for projects and distribute funds to those worthy projects based on a scoring process.

More information about the federal Land and Water Conservation Fund is available from Americans for Our Heritage and Recreation and the National Park Service website.

Farm and Ranch Land Protection Program (FRPP)

The federal Farm and Ranch Land Protection Program (FRPP) promotes the conservation of productive agricultural land through the purchase of development rights (PDR), or conservation easements. The 2002 Farm Bill provided a total of $600 million in funding authorization for FRPP between fiscal 2002 and 2007, up from $53 million in the prior Farm Bill. Between 1996 and 2002, more than 108,000 acres were protected through PDRs as a result of the program. In fiscal year 2004, the FRPP provided $87 million in grants to states, local governments and non-profit conservation groups to purchase conservation easements on agricultural land.

Grants for 50 percent of the cost of a permanent conservation easement (PDR) are awarded on a competitive basis, according to national and state criteria. Up to 25% of the easement's value can be donated by the landowner and counted as match. Grant applications are submitted by a state or local entity, or eligible non-profit, to the State Conservationist, a federal employee who oversees all USDA Natural Resources Conservation Service (NRCS) programs in that state. The state conservationist then prioritizes the projects and sends them to NRCS in Washington for approval of funding.

Forest Legacy Program (FLP)

Established in 1990, the Forest Legacy Program provides federal funding to states to assist in securing conservation easements on forestlands threatened with conversion to non-forest uses. States must first qualify before agencies or organizations within that state are eligible for funds.

A state voluntarily enters the program by submitting an Assessment of Need (AON) to the Secretary of Agriculture for approval. These plans establish the lead state agency, the state's criteria for Forest Legacy projects, and Forest Legacy areas within which proposed Legacy projects must be located. Some states draw very specific lines; others designate the entire state as an eligible Forest Legacy area.

The Forest Legacy Program rules require that states submit a list of proposed Forest Legacy projects to the U.S. Forest Service for funding consideration. To prepare that list, a state Forest Stewardship Committee meets to prioritize eligible projects. Each enrolled state has a Forest Legacy Program coordinator who oversees the project recommendation process and acts as the state's liaison to the U.S. Forest Service.

For much of the history of the program, funding was extremely limited. From a low point of $2 million in FY 1997, concerted efforts to improve the funding outlook for the program have been successful, resulting in a strong and steady increase to $30 million in FY00 and $71 million in FY04.

North American Wetlands Conservation Act (NAWCA)

The North American Wetlands Conservation Act was passed in 1989 to acquire, restore or enhance wetland ecosystems for waterfowl and other migratory birds. The program is administered by the U.S. Fish and Wildlife Service. There are standard grants and small grants – standard grants are from $51,000 to $1 million dollars and small grants are for up to $50,000.
The grants are available for private or public agencies in the U.S., Canada or Mexico. There is a 1:1 grant match requirement.

In December 2002, Congress reauthorized appropriations for the Act through FY 2007, reflecting its and the public's support of the Act's goals. Congress increased the appropriation authorization to $55 million in 2003, with $5 million appropriation increases to occur annually until FY 2007, when the appropriation cap will be $75

million (actual appropriations are determined each year). The NAWCA program's appropriation was $37.5 million in FY 2004. The southern states have been the most effective at applying for NAWCA grants. The projects are approved at the national level through the North American Wetlands Conservation Council.

Urban Park and Recreation Recovery Program (UPARR)

The Urban Park and Recreation Recovery Program was developed as the urban component to the Land and Water Conservation Fund in 1978. UPARR grants are given to eligible cities and counties and are meant to assist disadvantaged areas. The grants fund rehabilitation and planning for recreational services in urban areas. From the program's inception in 1978 to 2002, it has distributed approximately $272 million for 1,461 grants to local jurisdictions in 43 states, the District of Columbia and Puerto Rico. A local match of at least 30 percent is required for most grants. Appropriations for this program have varied widely from a high of more than $60 million in 1980 to zero dollars in 2003.

Community Development Block Grants (CDBG)

The Community Development Block Grants through the Department of Housing and Urban Development (HUD), provide funds for community-based projects. Examples of these types of funded projects are:

- Commercial district streetscape improvements;
- Sidewalk improvements;
- Safe routes to school; and
- Neighborhood-based bicycling and walking facilities that improve local transportation options or help revitalize neighborhoods.

Additional funds are available through Federal Land Agencies such as the National Forest Service, National Park Service, or Bureau of Land Management. These funds are primarily for trails and must be on federal lands.

State Funding Sources

The North Central Texas Council of Governments (NCTCOG) is a voluntary association of, by, and for local governments, and was established to assist local governments in planning for common needs, cooperating for mutual benefit, and coordinating for sound regional development. NCTCOG's purpose is to strengthen both the individual and collective power of local governments and to help them recognize regional opportunities, eliminate unnecessary duplication, and make joint decisions.

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There are a number of groups and organizations that advise and take direction from the NCTCOG. The Bicycle and Pedestrian Advisory Committee (BPAC) assists the Regional Transportation Council and the Executive Board of the NCTCOG in the selection of funded bicycle and pedestrian projects. The Bike Web is a tool on the NCTCOG website that gives information regarding existing and future bicycle trails information for the Dallas-Fort Worth Metroplex. For example, the Regional Veloweb is an advertised bicycle trail project being planned as a designated off-street 644 mile bicycle trail.

NCTCOG serves a 16-county region of North Central Texas, which is centered around the two urban centers of Dallas and Fort Worth. NCTCOG has over 230 member governments, including 16 counties, numerous cities, school districts, and special districts.

The NCTCOG relies on competitive calls for projects and other funding initiatives to determine which projects receive money. Projects are

selected that advance regional priorities. Projects are evaluated on their merits and impact on the transportation system. The selection criteria include cost effectiveness, congestion reduction and coordination with other modes of transportation.

There are a number of funding opportunities associated with NCTCOG including Transportation Enhancement (TE) Program, Sustainable Development Call for Projects (which receive funds from multiple sources), Local Air Quality Bicycle / Pedestrian Project Recommendations 2006, and Regional Tollway Revenue Funding Initiative. Some of these opportunities utilize outside funding sources while facilitating the selection process of projects such as the Sustainable Development Call for Projects while others benefit from generating their own funding source such as Regional Tollway Revenue Funding Initiative. CMAQ and STPMM are federal funds that get allocated to the States, and the State of Texas allocates these funds every six years in their traffic budgeting. STP-MM funds (Surface Transportation Program-Metropolitan Mobility), known as 'Mobility Funds', are federal funds selected by the RTC used on used on Capacity Increasing Projects (freeways, traffic flow improvements, air quality project, etc.).

Sustainable Development Program

This program is designed to foster growth and development in and around historic downtowns and Main Streets, infill areas, and passenger rail lines and stations. The program allocates transportation funds to projects promoting alternative transportation modes or reduced automobile use in an effort to address mounting air quality, congestion, and quality of life issues. For projects to be selected for this program, NCTCOG has issued Calls for Sustainable Projects. The NCTCOG Sustainable Development Program has facilitated a Call for Projects in a number of years including 2001, 2005, and 2009. In 2001, projects were funded through CMAQ and STPMM funds. In 2005, a local dollars bond was established that funded projects. 2009, the two regions that NCTCOG provides services were broken in half for funding sources. The Eastern region utilized Regional Toll Revenue funds while the Western region used STPMM funds.

Eligible project types included: infrastructure, land banking, Center of Development Excellence, and Sustainable Development projects. Through the 2005 Call for Projects, more than $16.9 million in funding was awarded to Sustainable Development projects with bicycle and pedestrian elements. The 2009 Call for Projects awarded $42 million dollars to sustainable transportation projects.

Local Air Quality Bicycle/Pedestrian Project Recommendations 2006

NCTCOG initiated the 2006 Local Government Air Quality Program in an effort to address the new federal 8-hour ozone standard, and the current non-attainment status of the Dallas-Fort Worth region. Eligible project types included: traffic signals, bicycle/pedestrian connections, park-and-ride reduction programs, air quality outreach and marketing programs, vanpool programs, and other air quality strategies. Bicycle and Pedestrian Projects received more than $9 million in funding through the Local Government Air Quality Program. The source for the funding of this program comes from CMAQ funds.

Visit the link below to view regional projects that were awarded funding through the 2006 Local Air Quality Funding Initiative.
www.nctcog.org/trans/tip/2006AugSTTCActionDRAFT_Recomnds_BikePed.pdf

Regional Tollway Revenue Funding Initiative

NCTCOG announced the Regional Tollway Revenue Funding Initiative in April 2007 and closed the Call for Projects on August 3, 2007. The Regional Tollway Revenue Funding initiative will distribute $2.5 billion in toll proceeds from State Highway 121 to fund roadway, transit, air quality, safety, sustainable development, and bicycle and pedestrian projects. Cost overruns and projects affected by federal recessions will receive priority funding. Of the 561 total projects submitted, the funding request for the 41 bicycle and pedestrian specific projects totals more than $94 million.

Visit the Regional Tollway Funding Initiative link below for the current status of NCTCOG funding recommendations.
www.nctcog.org/trans/tip/cda/index.asp

Future Transportation Needs

Currently, TxDOT is updating its statewide Long-Range Transportation Plan (LRTP), and is asking for input in developing this blueprint for how Texas addresses its future transportation needs. This plan will provide a framework for developing and implementing a multi-modal transportation system through 2035, including highways, rail, water ports, airports, pedestrian and bicycle facilities, pipelines, and Intelligent Transportation Systems. The LRTP is the foundation for many planning efforts underway at TxDOT. It is critical to inform TxDOT and the public about the importance of pedestrian and cycling issues. This will help to incorporate hike and bike-friendly language into the state-wide transportation plan.

State Coordinator

Typically, each state has a Bicycle and Pedestrian Coordinator in its state department of transportation. The coordinator helps promote and facilitate the increased use of nonmotorized transportation, including developing projects for the use of pedestrians and bicyclists and public educational, promotional, and safety programs for using such facilities. Typically, the FHWA Bicycle and Pedestrian Program issues guidance and is responsible for overseeing that requirements in legislation are understood and met by the states and other implementing agencies.

Bike Texas – Share the Road Program

BikeTexas launched an ongoing, extensive educational campaign on how to best Share the Road. The most effective cycling occurs when the bicycle is operated like a motor vehicle, sharing the same rights and responsibilities as the operators of other vehicles. The most powerful campaign has been the "Share the Road Y'all" specialty license plates.

Commorative Lance Armstrong license plate sales generate revenue to fund the Share the Road Program.

Not only have the plates brought in an estimated $40,000 for bicycle education in one year alone, but they have also provided matching leverage for $400,000 in federal grants and emphasized, to motorists and cyclists alike, the importance of sharing the road. For every plate sold, $22.00 goes to bicycle and motorist safety education programs. Also available are the Share the Road Ya'll Souvenir License Plates. For each souvenir plate, $10.00 goes to word BikeTexas education programs as well.

Bike Texas - Community Trails Program

The mission of BikeTexas is to advance bicycle access, safety and education in Texas. BikeTexas, formerly known as Texas Bicycle Coalition, was formed in 1991 to unify the voices of thousands of bicycle enthusiasts, the bicycle industry, Texas bicycle clubs and Texas-based bicycle rides and events. With the support of these members and community partners, BikeTexas seeks to develop and steward the future of bicycling in Texas and encourage bicycle use as a healthy and mainstream lifestyle and transportation choice.

BikeTexas has achieved unprecedented success, gaining statewide, national and even international prominence. Longstanding partners such as the Texas Department of Transportation (TxDOT), the Texas Department of Public Safety (TxDPS), the Texas Education Agency (TEA), the Texas Parks & Wildlife Department, the National Highway & Traffic Safety Administration (NHTSA), and the U.S. Department of Education have helped BikeTexas establish landmark programs such as the Texas SuperCyclist Program, the Texas SuperCollege Program, the BikeTexas Safe Routes to School Program, the BikeTexas Kids Kup, and many others.

BikeTexas is a nonprofit 501(c)(4) organization. Contributions and membership dues can be used for legislative efforts and therefore are not tax-deductible. BikeTexas Education Fund is a nonprofit 501(c)(3) organization. All donations to the Education Fund are tax-deductible to the extent allowed by law.
www.biketexas.org/index.php?option=com_content&view=article&id=48&Itemid=60

Seeking Foundation Support and Applying for Grants

Certain foundations and organizations exist which assist in direct funding for trail, bicycling and walking projects, while others exist to help citizen efforts become established with small seed funds or technical and publicity assistance. Before applying for any grant, it is crucial to review The Foundation Directory and The Foundation Grants Index published by the Foundation Center to learn if a particular project fits the requirements of the foundation. These publications are issued in electronic and printed forms, and may be found in public libraries. Contact each foundation for clarification of their particular requirements prior to deciding to submit an application. More information about the Foundation Center services is available by calling 212-620-4230. The best way to find such foundations is through the research and information services provided by the National Foundation Center. They maintain a vast storehouse of information, including the guidelines and application procedures for most foundations, and their past funding records. They can be reached at the website below. www.fdncenter.org

Texas Parks and Wildlife Department Recreational Trail Grants

The Texas Parks and Wildlife Department (TPWD) administers the National Recreational Trails Fund in Texas under the approval of the Federal Highway Administration (FHWA). A portion of the funding is received from federal gas taxes paid on fuel used in non-highway recreational vehicles. Trail grants can fund up to 80% of project cost for both motorized and non-motorized recreational trail projects. Eligible project types include: the construction of new recreational trails, improvement of existing trails, development of trailheads or trailside facilities, and acquiring property for trail corridors.

Visit the TPWD Recreational Trail Grants link to learn more about this funding opportunity.
www.tpwd.state.tx.us/business/grants/trpa/

Robert Wood Johnson Foundation (RWJF)

The RWJF awarded Texas with a $2 million childhood obesity grant. This grant will be used to evaluate the effectiveness of childhood obesity prevention policies. Texas is one of three states recently awarded $2 million by the RWJF to evaluate the effectiveness of childhood obesity prevention policies. Two key childhood obesity prevention policies will be evaluated: Texas SRTS program, a program encouraging students to be more physically active by walking to school, and food allocation package revisions administered through the Texas Women, Infants and Children (WIC) nutrition program. The purpose of the grants is to inform decision makers about the effectiveness of these two childhood obesity prevention policies. These studies will also help local, state, and national policymakers identify policies that work toward promoting children's healthy eating and increased physical activity. This grant is unique in that the size and diversity of Texas will allow for a large study of underserved populations, determining how these policies affect different segments of the at-risk population, including the Hispanic/Latino population along the Texas/Mexico border.

Grant Writing Tips

The following are some helpful tips for successful grant writing:

1. Read the directions and applications thoroughly.
2. Find out what projects were previously funded.
3. Obtain a copy of a successful application.
4. Find out who reviews the applications and talk to him or her; it may be an individual or a larger group.
5. Always include a picture and graphic that quickly conveys what is being requested in the application.
6. Identify key words and concepts in the grant application and then use them in your narrative.
7. Convey a sense of urgency. For example, if funding is not obtained, something of value such as a rail corridor will be lost.
8. Provide a timeline. Demonstrate that the project is ready to go once funding is secured.
9. Focus on a tangible product (e.g., construct something, purchase property,

etc.) Minimize the amount that could be spent overhead and design.

10. Demonstrate that you are leveraging funds and that this is not the only funding source; no one wants to be a sole source of funds for a project or program.

11. Demonstrate community support through letters from neighborhood associations, advocacy groups, and local businesses.

Nonprofit/Volunteer Groups

Many volunteer groups have established a history of developing trails throughout their communities. Nature, equestrian, and off-road bicycle trails can be built and maintained with the help of volunteer groups. Their efforts can be used as part of the required match for the Recreational Trails Program, (generally at $10 per volunteer hour, unless a volunteer is providing pro bono services in his normal line of work, then at his standard hourly rate). There are a variety of sources for nonprofit and volunteers, including national organizations, user groups, local residents, corporate community service initiatives, and business and civic support groups. Shared-use trails have spawned a widespread movement of local, non-profit organizations. Many of them have raised hundreds of thousands of dollars to plan and construct trails. A few of these organizations include:

The Trust for Public Land

The Trust for Public Land (TPL) is a national, nonprofit, land conservation organization that conserves land for people to enjoy as parks, community gardens, historic sites, rural lands, and other natural places, ensuring livable communities for generations to come. The Trust for Public Lands mission statement includes conserving land for people to enjoy as parks, gardens, and other natural places, ensuring livable communities for generations to come. Since 1972, TPL has worked with willing landowners, community groups, and national, state, and local agencies to complete close to 4,000 land conservation projects in 47 states, protecting 2.8 million acres. Since 1994, TPL has helped states and communities craft and pass over 380 ballot measures, generating $36 billion in new conservation-related funding. TPL's professional staff bridges the gap between the demands of the fast-moving private sector and the needs of public agencies to acquire important lands at a fair value. TPL seeks long-term relationships with local governments by providing services that include setting priorities for conservation, raising conservation funds, and acquiring land for public use. As an independent nonprofit, TPL can work in the marketplace in ways that public agencies often cannot. TPL can lend real estate expertise to complex land transactions and bridge gaps in public finances to secure and hold vital lands until the public acquisition process can proceed. TPL is a 501(c)(3) tax-exempt organization.

TLP Conservation Initiatives include:

- **Parks for People:** Working in cities and suburbs across America to ensure that everyone—in particular, every child—enjoys close-to-home access to a park, playground, or natural area.
- **Working Lands:** Protecting the farms, ranches, and forests that support land-based livelihoods and rural ways of life.
- **Natural Lands:** Conserving wilderness, wildlife habitat, and places of natural beauty for our children's children to explore.
- **Heritage Lands:** Safeguarding places of historical and cultural importance that keep us in touch with the past and who we are as a people.
- **Land & Water:** Preserving land to ensure clean drinking water and to protect the natural beauty of our coasts and waterways.

TLP Conservation Services include:

- **Conservation Vision:** TPL helps agencies and communities define conservation priorities, identify lands to be protected, and plan networks of conserved land that meet public need.
- **Conservation Finance:** TPL helps agencies and communities identify and raise funds for conservation from federal, state, local, and philanthropic sources.
- **Conservation Transactions:** TPL helps structure, negotiate, and complete land transactions that create parks, playgrounds, and protected natural areas.
- **Research & Education:** TPL acquires and

shares knowledge of conservation issues and techniques to improve the practice of conservation and promote its public benefits.

Recent TPL North Texas Projects

1. The Shadows, Wylie – 253 acres in 2005
2. Bowman Springs Nature Preserve, Arlington – 60 acres 2005
3. Arlington – 58 acres in 2005
4. Molsen Farm, Allen-52 acres in 2006
5. Pacific Plaza, Downtown Dallas – 1.5 acres in 2008
6. Wilson Creek Trail, McKinney – 55 acres in 2008
7. Chalk Hill Trail, Dallas – 33 acres in 2009
8. Dickerson Park, Dallas – 3.5 acres in 2009
9. Wilson Creek Trail, McKinney – 1.5 acres in 2009
10. Doubletree Ranch, Highland Village – 37 acres in 2009

For more information about the TPL, visit:
www.tpl.org

Bikes Belong Coalition

Bikes Belong Coalition (BBC) is sponsored by members of the American Bicycle Industry, and has a mission of putting more people on bikes more often. They will accept applications for grants of up to $10,000 each, and will consider successor grants for continuing projects, subject to policy guidelines. BBC will consider grants from local organizations, agencies, and communities in developing bicycle facilities projects. Contact BBC before submitting a completed application. Direct inquiries to Grants Program Administrator at 303-449-4893, or visit the website below.
www.bikesbelong.org

Bike DFW

Bike DFW is a group of cyclists and community members working to make cycling safer and easier in the Dallas and Fort Worth area. Their mission is to work with local cyclists, bike clubs, neighborhood advocacy groups, businesses, and city and county governments to increase utilitarian and recreational use of bicycles in North Texas. An important goal is to provide education to cyclists and motorists to encourage increased use of bicycles for transportation and making cycling safer. Bike DFW uses its own curricula and those developed by the League of American Bicyclists to provide bike-related education to individuals, cities, and cycling groups. Bike DFW members also participate in local and regional advisory committees, task forces, and planning groups to encourage and facilitate incorporation of bicycle-friendly policies and infrastructure into city and county transportation plans. Visit the website below for more information. www.bikedfw.org/

Carol M. White Physical Education Program

The purpose of the Carol M. White Physical Education Program is to provide funds to local educational agencies and community-based organizations (including faith-based organizations). The program initiates, expands, and improves physical education programs for students in one or more grades from kindergarten through 12 in order to make progress toward meeting state standards for physical education by providing funds for equipment, support, and the training and education of teachers and staff. In order to receive funding, each applicant must design and implement a program that clearly aligns to state standards for physical education and provides for one or more of the following elements:

- Fitness education and assessment to help students understand, improve, and maintain physical well-being.
- Instruction in motor skills and physical activities designed to enhance physical, mental, social, and emotional development.
- Development of, and instruction in, cognitive concepts about motor skills and physical fitness that support healthy lifestyles.
- Opportunities to develop positive social and cooperative skills through physical activity participation.
- Instruction in healthy eating habits and good nutrition.
- Opportunities for professional development for physical education teachers to stay abreast of current research, issues,

and trends in physical education.

Local Funding Sources

There are many examples of local communities creating revenue streams to improve conditions for bicycling and walking. Three common approaches include: special bond issues; dedications of a portion of local sales taxes or a voter-approved sales tax increase; and use of the annual capital improvement budgets of Public Works and/or Parks agencies.

Local Businesses and Partnerships

There is increasing corporate and business involvement in trail and conservation projects. Employers recognize that creating places to bike and walk is one way to build community and attract a quality work force. Bicycling and outdoor recreation businesses often support local projects and programs. Partnership engenders a spirit of cooperation, civic pride and community participation. Name recognition for corporate partners could be accomplished through signage and naming rights.

For further details and tips for accessing the corporate and business community contact the Trails and Greenways Clearinghouse at the Rails-to-Trails Conservancy: 1-877-GRNWAYS (476-9297).

Bond Funds or Capital Improvement Programs (CIP)

Other funding may come from bonding or CIP funds, either in conjunction with roadway transportation projects, as park development projects, or as stand alone trail or bicycle improvement projects. Bond or CIP election could be held to support the development of the bicycle and trail system. Trails can be implemented using bond funds alone or as the local match in grant applications. These funds are usually targeted for new facilities. Bonds can be used as the local match in applying for reimbursement grants offered by the Federal Highway Administration through TxDOT. Several bonding opportunities exist that include, Revenue Bonds, General Obligation Bonds and Special Assessment Bonds

Special Districts

Several kinds of special districts can help fund land Bikeway and walkway improvements, acquisition or maintenance. Special assessment districts are separate units of government that manage specific resources within defined boundaries. Districts vary in size, encompassing a single community or business district. They can be established by the local government or by voter initiative, depending on state laws and regulations. As self-financing legal entities, these districts have the ability to raise a predictable stream of money (through taxes, user fees, or bonds) directly from the people who benefit from the services—often parks and recreation. Special districts are helping protect and maintain parkland throughout the country.

Development and Impact Fees

Development fees can be used for park and trail development anywhere within the city. Impact fees can be used for sidewalks and street improvements for bicycling within the development area for which they were collected. These funds may also be used as the local match for projects when applying for reimbursement grants.

Taxes

Many communities have raised money through self-imposed increases in taxes. A number of taxes provide direct or indirect funding opportunities for local governments.

Property Tax or Real Estate Transfer Tax is a real estate tax on the sale of residential and commercial property to raise money for open space acquisition, including trail and sidewalk improvements. Cost can be imposed on sellers or purchasers of the property. Revenues are typically tied to the ups and downs of the real estate market. It has been utilized in a number of communities.

Another example is Gas Tax. Every state raises revenue for highway and transportation infrastructure through a state motor-vehicle fuel tax. Some states also raise funds through vehicle licensing fees. In many states, the laws governing how these funds can be spent would make

most pedestrian projects and programs eligible for these funds.

Sales or excise taxes at both the local and state levels are taxes on specific goods and services that require special legislation to enact. Sales tax is typically the second largest source of income after property taxes for state and local govenments. The funds made from the tax are limited to a specific use, such as food and beverage taxes for the promotion of greenway, bikeway, or walkway improvements.

Occupancy tax on hotel and motel rooms (special tax increment financing) for special districts may also be established throughout the community to create funding that can be dedicated to sidewalk and bicycle projects and improvements. This is often successful in commercial areas.

Impact Fees

An impact fee is a one-time charge that private entrepreneurs, often developers, must pay to the local government in order to build new housing units. In turn, the revenue from the impact fee finances public goods and services that the developer would not otherwise provide. Water and sewer lines, streets and bridges, and parks and recreational facilities are typical projects funded by impact fees. Most state statutes require a direct correlation between the projects funded and the impact of the development. The goal of impact fees is to enable a community to maintain a constant "level of service" (park acres/resident, library books/resident, road miles/resident), despite facing growth. However, impact fees are not designed to allow a community to provide higher levels of service than existed prior to a development's creation.

Impact fees have their detractors, who oppose the added cost of development and, in some cases, a decreased availability of affordable housing due to the impact of the fee. Impact fees often face legal challenges, primarily from developers who feel that they are being assessed to provide higher levels of service. To withstand litigation, proponents must carefully construct their impact fee program. Despite these challenges, impact fees are growing as a source of funding for the acquisition, construction and maintenance of parks and recreational facilities near new development.

City Budget

Low cost on-street bikeway improvements such as re-striping can often be accommodated within the transportation operation budgets. For streets requiring construction or reconstruction, space for on-road bicycling should be incorporated in the design and construction of these facilities. Streets built by developers to support their subdivisions should also incorporate space for bicyclists.

The Neighborhood Initiative Program (NIP)

The Neighborhood Initiative Program is designed to enhance the quality of life for neighborhood residents through the concentrated delivery of services and programs provided by working in partnership with the neighborhoods. The city's goal is to raise awareness of code and zoning ordinances, provide information on accessing city services and promote clean and safe neighborhoods.

Community Fundraising

A common approach is to find creative ways to break a large project into small pieces that can be "purchased" by the public or community through special fundraising activities and reinvigorate a community's sense of civic pride.

Regulatory or Development Controls

Through use of zoning, development, or redevelopment regulations, opportunities exist that would require private development activities to participate in the dedication of easements or the building of the proposed hike and bike improvements.

Arlington Tomorrow Foundation

The Arlington Tomorrow Foundation (ATF), a 501 (c) 3 non-profit foundation, was formed by the Arlington City Council to enhance the quality of life in the community. The ATF supports work throughout the community that will have a positive impact on the following:

- Safe and strong neighborhoods

- Historic preservation and beautification
- Arts and culture
- Libraries
- Environmental and energy conservation
- Parks and recreation
- Animal services
- Youth and families

The foundation oversees an endowment fund created from natural gas revenues on city-owned property. Ninety percent of gas well lease bonus earnings and fifty percent of all royalties earned on wells go to the permanent endowment. The interest earnings from this fund will be distributed to charitable and government organizations through grants to help improve the quality of life for the citizens of Arlington. In its first year of operation, the Foundation contributed more than $2 million to charitable and city organizations dedicated to serving the people of Arlington.

Summary of Funding Sources and Opportunities

	Funding Program	Source	Primary Purpose	Eligilibility	Availability	Case Studies
1	National Highway System (NHS)	Federal	Improvements to roads that are part of the NHS and NHS Intermodal connectors.	Construction of pedestrian and bicycle facilities on adjacent to any highway on the NHS.	Variable	
2	The American Recovery and Reinvestment Act of 2009 (ARRA)	Federal	Construction, resurfacing, and operational improvements for highway and bridges including transit and other modes.	Construction of bicycle and pedestrian transportation facilities; Non construction project for safe bicycle use; upgrade public sidewalks to comply with ADA. Project do not have to be in the right-of-way of a federal highway.	Variable, good source.	
3	The American Recovery and Reinvestment Act of 2009 (ARRA TE)	Federal	ARRA 3% set-aside for Transportation Enhancement Activities.	Construction of bicycle and pedestrian transportation facilities; Construction project for safe bicycle use; upgrade public sidewalks to comply with ADA. Project do not have to be in the right-of-way of a federal highway.	Variable, good source.	
4	Surface Transportation Program (STP)	Federal	Construction, resurfacing, and operational improvements for highway and bridges including transit and other modes.	Construction of bicycle and pedestrian transportation facilities; Construction project for safe bicycle use; upgrade public sidewalks to comply with ADA. Project do not have to be in the right-of-way of a federal highway.	Variable, good source.	
5	Surface Transportation Program (STP TE)	Federal	Surface Transportation Program set-aside for Transportation Enhancement Activities.	Construction of bicycle and pedestrian transportation facilities; Construction project for safe bicycle use; upgrade public sidewalks to comply with ADA. Project do not have to be in the right-of-way of a federal highway.	Variable, good source.	
6	Surface Transportational Program Enhancement Set aside (STP-E) or Transportation Enhancements, TE	Federal	Funds twelve specific activities including pedestrian and bicycle facilties.	3 out the 12 categories are pedestrian and bicycle facilities, safety and education for pedestrians and bicyclists and rail trail projects	Variable, good source.	
7	Office of Bicycle and Pedestrian Transportation	Federal	State may spend a portion of its federally allocated STP funds on bicycle and pedestrian facilities.	Construction of pedestrian and bicycle facilities, including Rails to Trails projects and non-construction projects such as brochures, public service announcements and route maps.	Variable, project must be part of a long range transportation plan.	
8	Environmental Protection Agency (EPA)	Federal	Funds are used to improve air quality and reduce transportation emissions.	Construction of bicycle facilities and greenways to reduce automobile use and promote bicycle use.	Variable, funding is approved through EPA's Office of Transportation and Air Quality (OTAQ).	

Summary of Funding Sources and Opportunities						
	Funding Program	**Source**	**Primary Purpose**	**Eligilibility**	**Availability**	**Case Studies**
9	Congestion Mitigation and Air Quality (CMAQ)	Federal	Funds projects in nonattainment and maintenance areas that reduce transportation related emissions.	Construction of pedestrian and bicycle facilties. Non construction projects for safe bicycle use. Projects do not have to be federal highway right-of-way but must demonstrate an air quality benefit.	Annual variable program, bicycle projects along commuter and through fair routes have the best potential to receive CMAQ funds.	
10	Highway Safety Improvement Program (HSIP)	Federal	Reduction in traffic fatalities and serious injuries on public roads.	Improvements for bike and ped safety. Construction of safety signage in school zones. Correction of hazardous locations including roadside obstacles, railway, highway crossing needs, poorly market roads that constitute a danger to bike and ped. Highway safety improvement projects on bike and ped pathways or trails.	Variable, good funding source for urban areas and crash-prone bicycle routes.	
11	Safe Routes to School (SRTS)	Federal	Enable and encourage children including those with disabilities to walk and bicycle to school. Facilitate the planning and development and implementation of projects and activities that will improve safety and reduce traffic, fuel consumption, air pollution in the vicinity of schools.	Sidewalk improvements, traffic calming and speed reduction improvements, pedestrian and bike crossing improvements, on street bike facilities, off street bike facilities, traffic diversion improvements. Public awareness campaigns and outreach, traffic education and enforcement in school zones.	SAFETEA-LU Coordinate with TxDOT. Six-year funding bill signed into law on August 10, 2005. Authorizes $244.1 billion in federal gas-tax revenue and other federal funds for all modes of surface transportation. Includes highways, bus and rail transit, bicycling, and walking. Bicycle and pedestrian programs can be included in programs eligible for over half the funds. None of the funds are dedicated solely for bicycle or pedestrian facilities or programs.	
12	Recreational Trails Program (RTP)	Federal	Develop and maintain recreational trails and trail related facilties for nonmotorized/motorized recreational trail uses.	Non motorized or mixed use (nonmotorized and motorized) trails. Eligible categories include trail maintenance and rehabilitation, trailside or trailhead faciltiies,construction and maintenance equipment, trail construction, trail assessments trail safety and environmental protection	Variable	
13	Land and Water Conservation Funds (LWCF)	Federal	Build a variety of park and recreational facilities including trails and greenways.	Greenway and trail facilities.	Variable	
14	Wetland Reserve Program	Federal	Provide technical and financial assistance to landowners who want to restore and protect wetland and riparian areas and place sensitive areas under permanent easements.	Open space and greenways in riparian buffers.	Variable administered through USDA's Natural Resource Conservation Service.	

Summary of Funding Sources and Opportunities						
	Funding Program	**Source**	**Primary Purpose**	**Eligibility**	**Availability**	**Case Studies**
15	National Endowment for the Arts	Federal	Funds related to arts program through the Design Arts Program Assistance and provides links to other federal departments/agencies that offer funding opportunities for arts and cultural programs.	Can support development of ancillary greenway and bicycle facilties that incorporate and celebrate community culture, art and history.	Variable	
16	Highway Bridge Replacement and Rehabilitation (HBRRP)	Federal	Replace and rehabilitate deficient highway bridges and retrofit bridges.	Pedestrian and bike facilities on highway bridges. If a highway bridge deck is replaced or rehabilitated and bicycles are permitted, then the bridge project must include safe bicycle accommodations.	Variable	
17	Job Access and Reverse Commute Grants	Federal	Intended to transport welfare recipients and eligible low-income individuals to and from employment.	Can fund pedestrian and bicycle-related services.	Variable	
18	Urbanized Area Formula Grants (Section 5307)	Federal	Transit capital and planning assistance to urbanized areas with populations over 50,000 and operating assistance to areas of populations of 50,000 - 200,000.	Improve bicycle and pedestrian access to transit facilities and vehicles, including bike stations.	Variable	
19	Urbanized Area Formula Grants Transportation Enhancements Set-aside	Federal	1% onset aside of section 5307 funds for areas with populations over 200,000 for 9 specific Transit Enhancement Activities.	Pedestrian and bike access, storage facilities, installing equipment to transport bikes on buses.	Variable	
20	Community Development Block Grants (CDBG)	Federal	Directly provides funds to cities and towns for projects with community wide benefits. Activities must benefit low to moderate income persons.	Greenways, trails, and bicycle facilities that provide increased safety, access, and transportation options.	Variable, through US Department of Housing and Urban Development (HUD).	
21	Other	Federal	High Priority Projects; Bridge; Interstate Maintenance; Federal Lands Highway Program (primarily Public Lands Highway Discretionary earmarks); Corridor Planning and Development and Border Infrastructure; Transportation, Community, and System Preservation; National Scenic Byways; Congressionally-earmarked funds, etc.	Greenways, trails, bicycle streetscape and other facilities that provide increased safety, access and transportation options and improvements.	Variable	
22	U.S. DOE - Carol M White Physical Education Program	Federal	Initiate, expand, and improve physical education programs (including after school programs) for students in one or more grades from kindergarten through 12.	Implement a physical education program to that furthers physical development through activities or education.	Variable, good source.	BikeTexas SRTS Program

Summary of Funding Sources and Opportunities

	Funding Program	Source	Primary Purpose	Eligibility	Availability	Case Studies
23	Transportation, Community, and System Preservation Program (TCSP)	Federal	Investigate the relationships between transportation, community, and system preservation plans and practices and identify private sector-based initiatives to improve such relationships.	Bicycle and pedestrian projects are eligible under this program.	Variable, $21,384,891 to Texas since 1999.	
24	Alternative Transportation in Parks and Public Lands	Federal	Enhance the protection of national parks and federal lands, and increase the enjoyment of those visiting them.	Alternative transportation projects, including non-motorized modes, in national parks and on other public lands.	Variable	
25	Share the Road Program	State	To educate and emphasize the importance of sharing the road with vehicles and cyclists.	Activities that promote bicyclist safety, education and access through education and awareness programs, training, workshops, educational materials and media events.	Variable	Bike Texas
26	Texas Parks and Wildlife Department (TPWD) -- Texas Recreation and Parks Account	State	Administered by TPWD's Recreation Grants Branch and funds five grant programs.	Construction of new recreational trails, improvement of existing trails, development of trailheads or trailside facilities, and acquiring property for trail corridors.	Variable. Outdoor Recreation Grants provide a 50 percent match to acquire and develop parkland or to renovate existing public recreation areas. The maximum grant awarded is $500,000. Small Community Grants provide a 50 percent match to develop and beautify parkland or to meet the recreation needs of Texas communities with a population of 20,000 and under. The maximum grant awarded is $50,000.	The City of Texarkana, Texas, has received a $100,000 Texas Parks and Wildlife matching grant to help complete the two-mile pathway around Spring Lake Park.
27	NCTCOG Sustainable Development Program	State	Promoting alternative transportation modes or reduced automobile use in an effort to address mounting air quality, congestion, and quality of life issues.	Infrastructure and planning grants.	Variable. Through the 2005 Call for Projects, more than $16.9 million of funding was awarded to Sustainable Development Projects with bicycle and pedestrian elements.	
28	NCTCOG 2006 Local Government Air Quality Program	State	Address the new federal 8-hour ozone standard, and the current non-attainment status of the Dallas-Fort Worth region.	Traffic signals, bicycle/pedestrian connections, park-and-ride reduction programs, air quality outreach and marketing programs, vanpool programs, and other air quality strategies	Bicycle and Pedestrian Projects received more than $9 million in funding through the Local Government Air Quality Program.	
29	Regional Tollway Revenue Funding Initiative	Regional	Expedites transportation projects by providing desperately needed funding.	Roadway, transit, air quality, safety, sustainable development, and bicycle and pedestrian projects.	Distribute $2.5 billion in toll proceeds from State Highway 121. Of the 561 total projects submitted, the funding request for the 41 bicycle and pedestrian specific projects totals more than $94 million.	

Summary of Funding Sources and Opportunities

	Funding Program	Source	Primary Purpose	Eligilibility	Availability	Case Studies
30	Bond Funds	Varies	Support the development of the trail system.	Trails can be implemented using bond funds alone or as the local match in grant applications. These funds are usually targeted for new facilities.	Variable	
31	Foundation and Corporate Grants	Varies	Develop trail projects, while others exist to help citizen efforts get established with small seed funds or technical and publicity assistance.	Contact each foundation for clarification of their particular requirements prior to deciding to submit an application.	Variable	
32	Grants for Greenways	Varies	Support for greenway interests.	Broad spectrum of both general and specific groups who provide technical and financial support.	Variable	
33	Bikes Belong Coalition	Membership Organization	Putting more people on bikes more often.	Bike paths and rail trails, as well as mountain bike trails, bike parks, BMX facilities, and large-scale bicycle advocacy initiatives.	Grants of up to $10,000 each, and will consider successor grants for continuing projects.	Texas Safe Routes to School, awarded Texas Bicycle Coalition a $10,000 grant to fund an informational campaign directing schools and the public through the Texas Safe Routes to School Program application process.
34	Neighborhood Initiative Program (NIP)	Local	Designed to enhance the quality of life for neighborhood residents through the concentrated delivery of services and programs.	Service or program that directly enhances quality of life in a neighborhood.	Variable	City of Corpus Christi
35	Funding from Independent School Districts	Local	Support the development of the trail system.	Some of these funds can be dedicated to trail development, especially near school zones.	Variable	
36	Tax Increment Financing (TIF)	Local	Support the development of the trail system.	Trail and greenway systems near commercial use.	Variable: Some of these funds can be dedicated especially in commercial areas.	
37	Development and Impact Fees	Local	Support the development of the trail system.	Park and trail development anywhere within the city. Impact fees can be used for sidewalks and street improvements for bicycling within the development area for which they were collected.	Variable	
38	Arlington Tomorrow Foundation	Local	Enhance the quality of life in the Arlington community.	Charitable and government organizations through grants to help improve the quality of life for the citizens of Arlington, Texas.	Variable, In its first year of operation, the foundation contributed more than $2 million to charitable and City organizations dedicated to serving the people of Arlington.	Arlington Parks and Recreation
39	Partnering with Volunteer Groups	Local	Support the development of the trail system.		Variable	

Successfully Funded Texas Bicycle and Pedestrian Projects

District / Agency	County	Program	Project Name / Facility	Project Limits	Project Description	Funds	Project Status
TXDOT-Dallas	Collin	ARRA-Enhancement	Richardson Trail	Alma Road to 0.24 Miles; South of Renner Rd.	Construct 10 foot wide concrete trail.	ARRA-$975,600	Under Construction
N/A	Dallas	ARRA-Enhancement	Tenison Trail - East Dallas Veloway	Winsted Dr Within Old SP & SF RR ROW to S.E. Over Garland Rd. to Glasgow St.	Construct bicycle / pedestrian path	ARRA-$1,982,128	Under Construction
TXDOT-Dallas	Dallas	ARRA-Enhancement	Santa Fe Trestle Bridge Trail	Existing trailhead at Moore Park to N. Trinity River Levee, Downtown	Santa Fe Trestle Hike and Bike Trail	ARRA-$3,547,603	Low Bid Accepted-Construction Begins March 2010
TXDOT-Dallas	Dallas	ARRA-Enhancement	Lancaster Historic District	City of Lancaster Historic District	Scenic beautification project to provide street furniture elements / lights, tables, trash cans, bike racks	ARRA-$470,932	Under Construction - Bid September 2009
TXDOT-Dallas	Dallas	ARRA-Enhancement	Spring Valley / COIT Amenities	NW side of Coit Rd from Spring to Valley North to Hay Meadow Dr.	Pedestrian bicycle trails	ARRA-$582,240	60% Design Completed
TXDOT-Dallas	Dallas	ARRA-Enhancement	Woodall Rodgers Deck/ Plaza/ Sp 366	West of Saint Paul to East of Pearl St.	Construction of deck and plaza over freeway	ARRA-$16,700,000	Under Construction - March 26, 2009
TXDOT-Fort Worth	Parker	ARRA-Enhancement	Town Creek Hike and Bike Trail	Downtown Weatherford to Subdivisions , Hospital facility	Construct hike and bike trail to connect downtown with other facilities in Weatherford	ARRA-$3,225,930	Funds 2002 - 60% Design Completed Construction June 2010
TXDOT-Fort Worth	Tarrant	ARRA-Enhancement	North Richland Hills Multi-Use Trail	N Richland Hills Multi-Use Trail and Landscaping in N. Richland Hills	N. Richland Hills Multi-Use Trail	ARRA-$475,315	60% Design Completed
Waco	McLennan	Transportation Enhancement	Waco Suspension Bridge and Trail	Near Brazos Riverfront	Multi-use trail on riverfront	$320,000	Let June 1995 - Completed
Wichita Falls	Wichita	Transportation Enhancement	Holliday Creek Hike and Bike Trail, Phase 1,2, and 3, and Riverwalk Bridge Project	Holliday Creek	Segments of bicycle and pedestrian multi-use trail that will ultimately form a loop around Wichita Falls	$2,294,712 (4 Total Projects)	Let January 1996 - Completed
San Angelo	Tom Green	Transportation Enhancement	San Angelo Pedestrian Mallway	Along Concho River	Pedestrian bicycle path / riverwalk to connect City's transit terminal with downtown area	$192,000	Let June 1997 - Completed

ARRA FUNDS BEGAN FEBRUARY 17, 2009 TO CURRENT.

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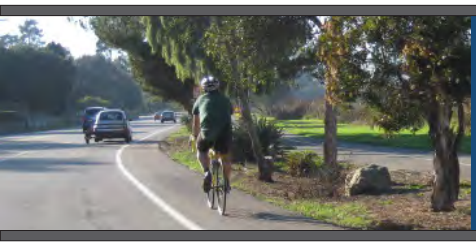


E. BIKE NETWORK TABLE

Appendix Contents

Overview

Bike Network Table

Overview

This appendix breaks out the entire recommended bicycle network into an alphabetized list that includes the parameters, types, construction method, and distances of each segment.

Bike Network Table

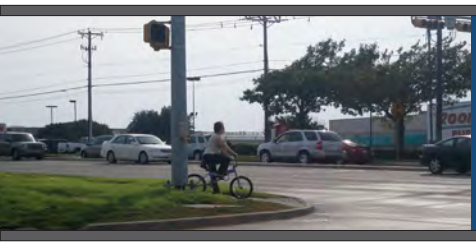
Roadway	To	From	Bike Facility Type	Bike Facility	Const. Method	Distance (feet)
Aires Drive	Pierce Arrow Dr.	W. Lynn Creek Dr.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	1,150
Ascension Boulevard	N.E. Green Oaks Blvd.	Brown Blvd.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	1,550
Beachview Drive	Shorewood Dr.	Edgewater Ct.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	950
Bert Drive	Margaret Dr.	N. Cooper St.	Separated in-roadway	Bike Lane	Stripe	1,500
Bever Boulevard	W. Inwood Dr.	W. Tucker Blvd.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	650
Big Springs Drive	Kelly Elliott Rd.	Highgrove Dr.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	1,492
Butterfield Road	Dangerfield Ct.	Cameron Dr.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	250
Calender Road	Collard Rd.	W. Sublett Rd.	Separated in-roadway	Bike Lane	New Construction	3,500
Calender Road	Curry Rd./Eden Rd.	Turner Warnell Rd.	Separated in-roadway	Bike Lane	New Construction	8,000
California Lane	Medlin Dr.	Park Dr. (DWG)	Shared bikeway roadway	Signed Bike Route	Signage and Markings	9,450
Cameron Drive	Butterfield Rd.	Crest Dr.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	800
Chapel Springs Drive	Spring Creek Rd.	Overridge Dr.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	790
Craig Hanking Drive	New York Ave.	Sherry St.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	2,700
Cresswell Drive	W. Harris Rd.	Tin Cup Dr.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	1,500
Crest Drive	Stage Line Dr.	Cameron Dr.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	700
Curry Road/ Eden Road	Calender Rd.	Calender Rd.	Separated in-roadway	Bike Lane	New Construction	440
Curt Drive	Indian Summer Ln.	Kelly Perkins Rd.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	1,300
Dangerfield Court	Little Rd.	Butterfield Rd.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	600

Roadway	To	From	Bike Facility Type	Bike Facility	Const. Method	Distance (feet)
Daniel Drive	Lovers Ln.	E. Pioneer Pkwy.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	2,000
Daniel Drive	E. Pioneer Pkwy.	Timberview Ln.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	2,700
Doug Russell Road	S. Oak St.	S. Pecan St.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	350
E. Border Street	S. Center St.	S. Mesquite St.	Separated in-roadway	Bike Lane	Road Diet	400
E. Embercrest Drive	Matlock Rd.	Yaupon Dr.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	3,470
E. Lovers Lane	S. Collins St.	New York Ave.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	5,300
E. Lynn Creek Drive	Matlock Rd.	Limerick Ln.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	900
E. Mitchell Street	S. Center St.	Mary St.	Separated in-roadway	Bike Lane	Road Diet	1,100
E. Mitchell Street	Mary St.	McKay St.	Separated in-roadway	Bike Lane	Stripe	3,100
E. Mitchell Street	McKay St.	Susan Dr.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	11,450
E. Sanford Street	N. Mesquite St.	N. Collins St.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	3,500
E. Sanford Street	N. Collins St.	Stadium Dr.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	4,100
E. Second Street	S. Center St.	Mary St.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	1,350
E. Timberview Lane	S. Center St.	Sherry St.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	10,600
E. Tucker Boulevard	S. Center St.	S. Collins St.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	2,300
Edgewater Court	Beachview Dr.	Utility Corridor	Shared bikeway roadway	Signed Bike Route	Signage and Markings	200
Gentle Springs Drive	Kelly Elliott Rd.	Park Springs Blvd.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	2,700
Hardisty Drive	Bluebird Dr.	S. Cooper St.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	4,700
Hardisty Drive	S. Cooper St.	Pierce Arrow Dr.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	1,120
Indian Summer Lane	Indian Trl.	Curt Dr.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	850
Indian Trail	Indian Summer Ln.	Sieber Dr. (DWG)	Shared bikeway roadway	Signed Bike Route	Signage and Markings	3,900
Kelly Elliott Road	Bardin Rd.	Gentle Springs Dr.	Separated in-roadway	Bike Lane	New Construction	9,400
Kelly Elliott Road	Gentle Springs Dr.	Big Springs Dr.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	2,400
Kelly Elliott Road	W. Pleasant Ridge Rd.	Bardin Rd.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	5,400
Lincoln Drive	Pitkin Dr.	N.E. Green Oaks Blvd.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	1,300
Lincoln Drive	N.E. Green Oaks Blvd.	N. Center St.	Separated in-roadway	Bike Lane	Stripe	9,500
Little Road	W. Green Oaks Blvd.	Treepoint Dr.	Separated in-roadway	Wide Outside Lane	Stripe	6,000
Mansfield Webb Road	Silo Rd.	Bowman Branch Linear Park	Shared bikeway roadway	Signed Bike Route	Signage and Markings	1,750

Roadway	To	From	Bike Facility Type	Bike Facility	Const. Method	Distance (feet)
Mansfield Webb Road	Silo Rd.	New York Ave.	Separated in-roadway	Bike Lane	New Construction	8,500
Margaret Drive	N.W. Green Oaks Blvd.	Bert Dr.	Separated in-roadway	Bike Lane	Stripe	3,450
Margaret Drive	Bert Dr.	Wayland Dr.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	2,600
Medlin Drive	W. Arkansas Ln.	California Ln.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	2,600
N. Center Street	Lincoln Dr.	E. Road to Six Flags St.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	1,900
N. Center Street	E. Road to Six Flags St.	E. Main St.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	7,800
N. Davis Drive	W. Sanford St.	W. Main St.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	2,100
N. Mesquite Street	N. Center St.	E. Main St.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	5,550
New York Avenue	Tech Centre Pkwy.	E. Bardin Rd.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	3,250
Norwood Lane	W. Park Row	Lynnwood Dr.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	1,650
Norwood Lane	Lynnwood Dr.	S. Bowen Rd.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	4,150
Norwood Lane	W. Abram St.	S. Fielder Rd.	Separated in-roadway	Bike Lane	Road Diet	3,400
Oakwood Lane	N.W. Green Oaks Blvd.	W. Randol Mill Rd.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	5,800
Oakwood Lane	W. Randol Mill Rd.	W. Sanford St.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	2,650
Overridge Drive	Stage Line Dr.	Chapel Springs Dr.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	1,250
Park Drive (DWG)	California Ln. (DWG)	Sunset Ln. (DWG)	Shared bikeway roadway	Signed Bike Route	Signage and Markings	1,350
Perkins Place	W. Arkansas Ln.	Perkins Rd.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	1,230
Perkins Road	Perkins Plc.	Waterview Dr.	Separated in-roadway	Bike Lane	Road Diet	3,450
Petra Drive	Wimbledon Dr.	W. Nathan Lowe Rd.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	2,850
Pierce Arrow Drive	Hardisty Dr.	Aires Dr.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	2,400
Pitkin Drive	Proposed greenway	Lincoln Dr.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	420
Ponselle Drive	Proposed Greenway	Stetter Dr.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	120
Redstone Drive	Park Springs Blvd.	Sandstone Dr.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	4,450
S. Bowen Road	W. Bardin Rd.	near Vintage Dr.	Separated in-roadway	Bike Lane	New Construction	9,950
S. Center Street	W. Main St.	E. Park Row Dr.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	6,250
S. Center Street	E. Arkansas Ln.	E. Timberview Ln.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	2,400
S. Center Street	Highlander Blvd.	Knightsbridge Rd.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	6,100
S. Davis Drive	W. Main St.	Park Row Dr.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	5,750

Roadway	To	From	Bike Facility Type	Bike Facility	Const. Method	Distance (feet)
S. Davis Drive	Park Row Dr.	W. Arkansas Ln.	Separated in-roadway	Bike Lane	Stripe	5,350
S. Mesquite Street	E. Main St.	S. Center St.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	4,900
S. Oak St./ Brookview Dr.	Doug Russell Rd.	W. Inwood Dr.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	3,600
S. Pecan Street	W. Mitchell St.	W. Park Row Dr.	Separated in-roadway	Bike Lane	Road Diet	2,300
Sandalwood Lane	Wimbledon Dr.	W. Embercrest Dr.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	1,900
Sandstone Drive	Redstone Dr.	Kingswood Dr.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	800
Sherry Street	E. Mitchell St.	Shagbark Ln.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	6,000
Shorewood Drive	Beachview Dr.	W. Poly Webb Rd.	Separated in-roadway	Bike Lane	Stripe	3,200
Shorewood Drive	W. Poly Webb Rd.	Bowman Springs Rd.	Separated in-roadway	Bike Lane	Road Diet	1,300
Sieber Drive (DWG)	Spanish Trl.	Indian Trl. (DWG)	Shared bikeway roadway	Signed Bike Route	Signage and Markings	1,450
Silo Road	Cravens Park Dr.	E. Sublett Rd.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	3,000
Silo Road	E. Sublett Rd.	Mansfield Webb Rd.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	8,200
Smith Barry Road (Pantego)	Spanish Trl. (Pantego)	S. Bowen Rd.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	5,200
Southeast Parkway	Sublett Rd.	East City Limit	Separated in-roadway	Bike Lane	New Construction	12,500
Spanish Trail	Smith Barry Rd. (Pantego)	Sieber Dr. (DWG)	Shared bikeway roadway	Signed Bike Route	Signage and Markings	4,800
Spring Creek Road	Chapel Springs Dr.	W. Bardin Rd.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	1,200
Stage Line Drive	Crest Dr.	Overridge Dr.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	2,150
Stetter Drive	W. Lynn Creek Dr.	Ponselle Dr.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	2,800
Sunset Lane (DWG)	Sieber Dr. (DWG)	Park Dr. (DWG)	Shared bikeway roadway	Signed Bike Route	Signage and Markings	850
Susan Drive	E. Mitchell St.	Deer Creek Dr.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	400
Susan Drive	Deer Creek Dr.	E. Pioneer Pkwy.	Separated in-roadway	Signed Bike Route	Signage and Markings	4,600
Tech Centre Parkway	Trace Mills Dr.	New York Ave.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	700
Tin Cup Drive	Cresswell Dr.	Bowman Branch Linear Park	Shared bikeway roadway	Signed Bike Route	Signage and Markings	2,800
Treepoint Drive	Little Rd.	SW Nature Preserve	Shared bikeway roadway	Signed Bike Route	Signage and Markings	3,900
UTA Boulevard	S. Davis Dr.	S. Center St.	Separated in-roadway	Bike Lane	Road Diet	5,000
W. Arkansas Lane	Richard Simpson Park	Perkins Plc.	Separated in-roadway	Bike Lane	Stripe	2,100
W. Embercrest Drive	Sandalwood Ln.	Matlock Rd.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	1,500
W. Inwood Drive	Bever Blvd.	Brookview Dr.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	2,800

Roadway	To	From	Bike Facility Type	Bike Facility	Const. Method	Distance (feet)
W. Lynn Creek Drive	Aires Dr.	Matlock Rd.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	2,500
W. Mitchell Street	S. Davis Dr.	S. Center St.	Separated in-roadway	Bike Lane	Road Diet	5,600
W. Sanford Street	Oakwood Ln.	N. Mesquite St.	Separated in-roadway	Bike Lane	Stripe	10,500
W. Second Street	S. Fielder Rd.	S. Davis Dr.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	2,650
W. Sublett Road	West City Limit	Hwy 287	Separated in-roadway	Paved Shoulder	New Construction	3,500
W. Tucker Boulevard	S. Bowen Rd.	Bever Blvd.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	9,100
Wagon Wheel Trail	W. Park Row Dr.	Smith Barry Rd. (Pantego)	Shared bikeway roadway	Signed Bike Route	Signage and Markings	2,700
Washington Drive	N. Cooper St.	Lincoln Dr.	Separated in-roadway	Bike Lane	Stripe	3,200
Waterview Drive	Perkins Rd.	Woodlake Dr.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	850
Wimbledon Drive	Petra Dr.	Sandalwood Ln.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	1,050
Woodlake Drive	Waterview Dr.	N. of Amicable Dr.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	200
Woodside Drive	Woodland Park Blvd.	W. Pleasant Ridge Rd.	Shared bikeway roadway	Signed Bike Route	Signage and Markings	11,750



F. INTERSECTION INVENTORY AND RECOMMENDATIONS

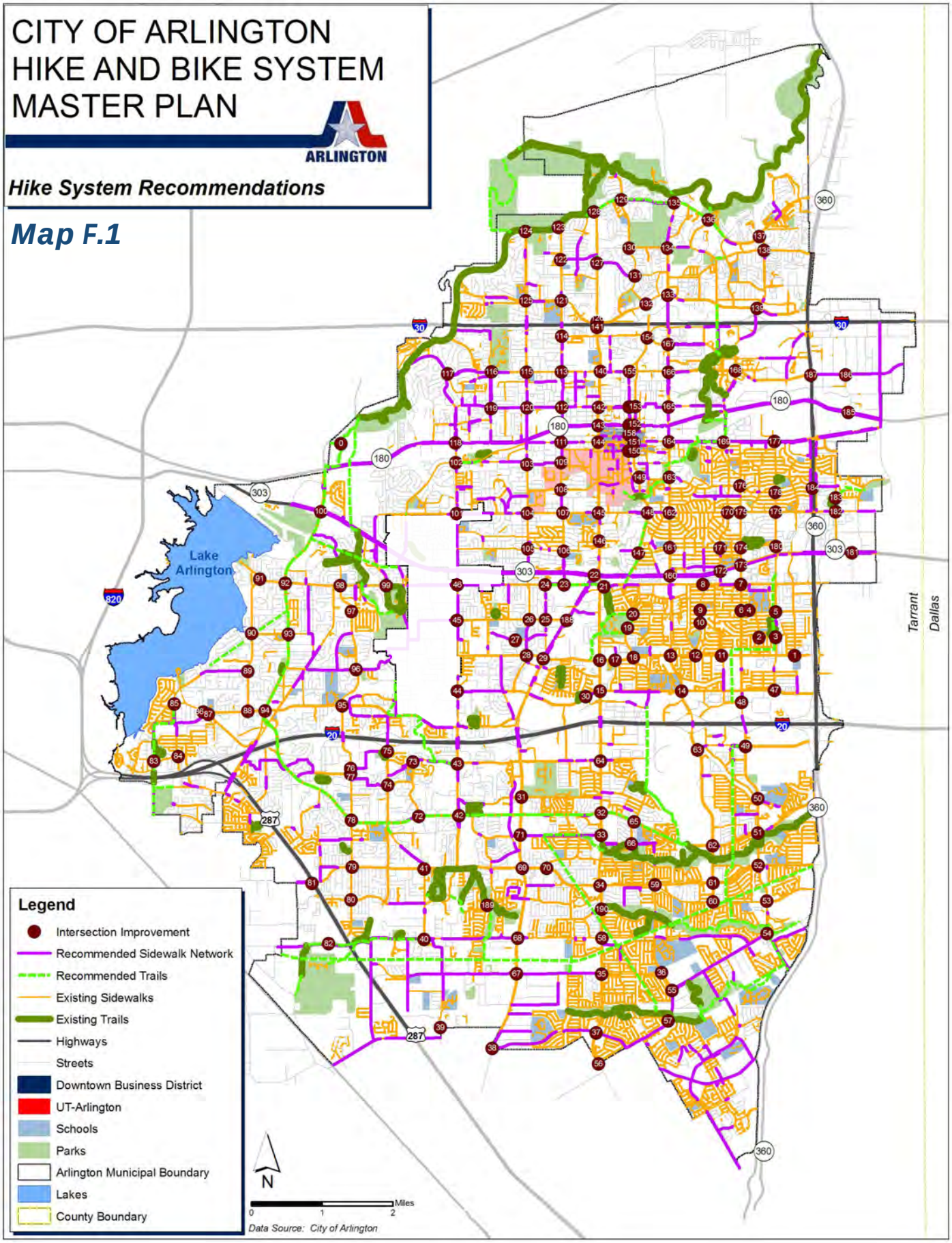
Appendix Contents

Overview

Intersection Inventory Tables

Overview

Committee input, public input, and consultant fieldwork identified 190 key intersections in Arlington in need of improvement. These are by no means the only crossing improvements needed throughout the City. All intersections should meet standards provided in Chapter 7: Design Guidelines. See the following map and tables for the intersection inventory and recommendations (numbered intersections on Map F.1 correspond with the tables).



Intersection numbers correspond with tables in this appendix.

APPENDIX F: INTERSECTION INVENTORY TABLES

Intersection Improvement Project #	Road 1	Road 2	Reason (Major intersection, school, connectivity, etc	Sight Distance (Good, Fair, Poor)	Signage (Y/N)	Controlled/ Uncontrolled	Stop Light/ Stop Sign	Curb Ramp (Y/N)	Curb Ramp (Complete/ Incomplete)	Curb Radius (Very Wide, Wide, Not Wide)	Marked Crosswalk (Y/N)	Number and Location of Crosswalks Adequate (Y/N)	Highly Visible (Y/N)	Crosswalk Condition (Good/Fair/ Poor)	Advanced Stop Line (Y/N)	Pedestrian Xing Signal (Y/N)	Type of Signal (Regular, Countdown)	Curb Extension (Y/N)	Sidewalk (Y/N)	Sidewalk Complete/Incom plete	Median island (Y/N)	Median Island Condition and Width	Estimated Traffic Volume (High/Medium/ Low)	Speed Limit	Other Notes
1	Mayfield	Carter	School	F	N	Y	SL	Y	Complete	Wide	Y	3, Y	N	P	Y	Y	Regular	N	Y	Complete	Y	Concrete, 6'	Medium	School - 20 MPH, 40 MPH	Photos 1-4
2	Legend	Overbrook	School	G	Y	Y	SS	Y	Complete	Not Wide	Y	4, Y	Y	G	Y	N	_	N	Y	Complete	N	_	Low	School - 20 MPH, 30 MPH	Photos 5-6
3	Sherry	Overbrook	Near School	G	N	Y	SS	Y	Complete	Wide	Y	4, Y	Y	F	Y	N	_	N	Y	Complete	N	_	Medium	30 MPH, 40 MPH	Photos 7-8
4	Billy Stewart	Timber View	School	G	Y	Y	SS	N	Incomplete	Not Wide	Y	1, Y	Y	F	Y	N	_	N	Y	Incomplete	N	_	Low	School - 20 MPH, 30 MPH	Photos 9-10
5	Sherry	Timber View	Near School	F	N	Y	SS	Y	Complete	Not Wide	Y	4, Y	Y	F	Y	N	_	N	Y	Complete	N	_	Medium	30 MPH, 40 MPH	Photos 11-12
6	New York	Timber View	Near School, Major Intersection	F	N	Y	SL	Y	Complete	Not Wide	Y	4, Y	N	F	Y	Y	Regular	N	Y	Complete	Y	Grass, 12'	Medium	30 MPH, 40 MPH	Photos 13-15
7	Arkansas	New York	Major Intersection	G	N	Y	SL	Y	Incomplete (2 out 4)	Wide	Y	4, Y	N	P	Y	Y	Regular	N	Y	Complete	Y	Concrete, 4'	High	40 MPH	Photos 16-22
8	Daniel	Arkansas	Major Intersection	G	Y	Y	SL	Y	Complete	Wide	Y	4, Y	Y	F	Y	Y	Regular	N	Y	Complete	Y	Concrete, 4'	Medium	30 MPH, 40 MPH	Photos 23-25
9	Daniel	Timber View	School	G	N	Y	SS	Y	Complete	Not Wide	Y	4, Y	Y	F	Y	N	_	N	Y	Incomplete	N	_	Low	School - 20 MPH, 30 MPH	Photos 26-27
10	Daniel	Rambler	Near School	G	N	Y	SS	Y	Complete	Not Wide	N	0, N	N	P	N	N	_	N	Y	Incomplete	N	_	Low	30 MPH	Photos 28-29
11	Mayfield	Allen	Major Intersection	G	N	Y	SS	Y	Complete	Not Wide	N	0, N	N	P	Y	N	_	N	Y	Complete	Y	Concrete, 4'	Medium - High	30 MPH, 40 MPH	Photos 30-32
12	Mayfield	Daniel	Major Intersection, Near School	G	N	Y	SL	Y	Complete	Not Wide	Y	3, Y	Y	F	Y	Y	Regular	N	Y	Complete	Y	Concrete, 4'	Low - Medium	30 MPH, 40 MPH	Photos 33-35
13	Mayfield	Collins	Major Intersection	G	N	Y	SL	Y	Complete	Wide	Y	4	N	F	Y	Y	Regular	N	Y	Complete	Y	Concrete, 6' Grass, 10'	High	30 MPH, 40 MPH	Photos 36-39
14	Carter	Arbrook	Major School	F	Y	Y	SL	Y	Complete	Not Wide	Y	4, Y	N	F	Y	Y	Regular	N	Y	Incomplete	Y	Concrete, 6'	High	30 MPH, 40 MPH	Photos 40-43
15	Matlock	Arbrook	Major Intersection	G	N	Y	SL	Y	Complete	Wide	Y	4, Y	Y	F	Y	Y	Regular	N	Y	Complete	Y	Concrete / Grass, 10'	High	40 MPH	Photos 44-48
16	Matlock	Mayfield	Major Intersection	G	N	Y	SL	Y	Complete	Wide	Y	4, Y	Y	F	Y	Y	Regular	N	Y	Complete	Y	Concrete, 6' Grass, 10'	High	40 MPH	Photos 49-51
17	Omega	Mayfield	Tennis Center	G	N	N	_	Y	Incomplete	Not Wide	N	2, Y	N	P	N	N	_	N	Y	Complete	N	Concrete, 6'	Medium	40 MPH	Photos 52-54
18	Center	Mayfield	School	G	Y	Y	SL	Y	Complete	Not Wide	Y	4, Y	N	F	Y	Y	Regular	N	Y	Complete	Y	Grass, 8'	Medium	40 MPH	Photos 55-58
19	Caven Dish	Center	Park	G	Y	Y	SS	Y	Incomplete	Not Wide	N	0	N	P	Y	N	_	N	Y	Incomplete	N	_	Medium	30 MPH	Photos 59-62
20	Center	Timber View	Park	G	Y	Y	SS	Y	Complete	Not Wide	Y	4, Y	Y	F	Y	N	_	N	Y	Incomplete	N	_	Medium	40 MPH	Photos 63-65

APPENDIX G: INTERSECTION INVENTORY TABLES

Intersection Improvement Project #	Road 1	Road 2	Reason (Major intersection, school, connectivity, etc	Sight Distance (Good, Fair, Poor)	Signage (Y/N)	Controlled/ Uncontrolled	Stop Light/ Stop Sign	Curb Ramp (Y/N)	Curb Ramp (Complete/ Incomplete)	Curb Radius (Very Wide, Wide, Not Wide)	Marked Crosswalk (Y/N)	Number and Location of Crosswalks Adequate (Y/N)	Highly Visible (Y/N)	Crosswalk Condition (Good/Fair/ Poor)	Advanced Stop Line (Y/N)	Pedestrian Xing Signal (Y/N)	Type of Signal (Regular, Countdown)	Curb Extension (Y/N)	Sidewalk (Y/N)	Sidewalk Complete/Incomplete	Median island (Y/N)	Median Island Condition and Width	Estimated Traffic Volume (High/Medium/ Low)	Speed Limit	Other Notes
21	**Center**	**Arkansas**	Major Intersection	G	Y	Y	SS	Y	Complete	Wide	Y	4	Y	F	Y	Y	Regular	N	Y	Complete	Y	Concrete, 6'	Medium	40 MPH	Photos 66-69
22	**Cooper**	**303**	Major Intersection	G	Y	Y	SL	Y	Complete	Very Wide	Y	4	N	F	Y	Y	Regular	N	Y	Incomplete	Y	Concrete, 6'	High	40 MPH	Photos 70-76
23	**Arkansas**	**Davis**	Connectivity Bike Trail	G	Y	Y	SL	Y	Complete	Wide	Y	4, Y	N	F	Y	Y	Regular	N	Y	Incomplete	Y	Concrete, 4'	Medium	40 MPH	Photos 77-79
24	**Medlin**	**Arkansas**	Connectivity Bike Trail	G	Y	Y	SL	Y	Incomplete	Not Wide	Y	3, Y	N	F	Y	Y	Regular	N	Y	Complete	Y	Grass, 8'	Medium	40 MPH	Photos 80-84
25	**Medlin**	**California**	Connectivity Bike Trail	G	Y	Y	SS	Y	Incomplete	Not Wide	N	0, N	N	P	N	N	_	N	Y	Incomplete	N	_	Medium	35 MPH	Photos 85-88
26	**Fielder**	**California**	Connectivity Bike Trail	G	Y	Y	SL	Y	Complete	Wide	Y	4, Y	Y	F	Y	Y	Regular	N	Y	Incomplete	N	_	Medium	35 MPH	Photos 89-91
27	**Cannon Gate**	**Paisley**	School	G	Y	Y	SS	Y	Incomplete	Not Wide	N	2, N	N	F	Y	N	_	N	Y	Incomplete	N	_	Low	30 MPH	Photos 92-93
28	**Mayfield**	**Fielder**	Connectivity Bike Trail	G	Y	Y	SL	Y	Complete	Wide	Y	4, Y	N	F	Y	Y	Regular	N	Y	Incomplete	Y	Concrete, 6'	Medium	40 MPH	Photos 94-96
29	**Mayfield**	**Cooper**	Major Intersection	G	Y	Y	SL	Y	Incomplete	Wide	Y	4, Y	N	F	Y	Y	Regular	N	Y	Incomplete	Y	Concrete, 4'	High	40 MPH	Photos 97-100
30	**High Point**	**Arbrook**	Connectivity Bike Trail	P	Y	Y	SL	Y	Incomplete	Wide	Y	3, Y	N	F	Y	Y	Regular	N	Y	Incomplete	Y	Grass, 20'	Medium	40 MPH	Photos 101-105
31	**Wimbledon**	**Cooper**	Major Intersection	G	N	Y	SL	Y	Complete	Very Wide	Y	4, Y	N	F	Y	Y	Regular	N	Y	Complete	Y	Concrete, 4'	High	40 MPH	Photos 106-108
32	**Green Oaks**	**Matlock**	Major Intersection	G	N	Y	SL	Y	Complete	Very Wide	Y	4, Y	N	F	Y	Y	Regular	N	Y	Complete	Y	Concrete, 8'	High	40 MPH	Photos 109-112
33	**Nathan Lowe**	**Matlock**	Bike Trail	G	N	Y	_	Y	Incomplete	Wide	N	N	N	P	N	N	_	N	N	Incomplete	Y	Grass, 15'	Medium	40 MPH	Photos 113-115
34	**Sublett**	**Matlock**	Bike Crossing	G	N	Y	SL	Y	Complete	Wide	Y	3, Y	N	F	Y	Y	Regular	N	Y	Complete	Y	Grass, 10'	High	40 MPH	Photos 116-118
35	**Harris**	**Matlock**	Bike Crossing	G	N	Y	SL	Y	Complete	Not Wide	Y	4, Y	N	F	Y	Y	Regular	N	Y	Complete	Y	Grass, 10'	High	40 MPH	Photos 119-122
36	**Harris**	**Silo**	Bike Crossing	G	N	Y	SS	Y	Incomplete	Not Wide	N	0, N	N	P	Y	N	_	N	Y	Complete	N	_	Medium	40 MPH	Photos 123-125
37	**Matlock**	**Turner Warnell**	Bike Trail	G	N	Y	SL	Y	Complete	Very Wide	Y	4, Y	N	P	Y	Y	Regular	N	Y	Complete	Y	Concrete, 6' Grass 12'	High	40 MPH	Photos 126-128
38	**Copper**	**Turner Warnell**	Major Intersection, Bike Trail	G	N	Y	SL	Y	Incomplete	Very Wide	Y	4, Y	N	F	Y	Y	Regular	N	N	Incomplete	Y	Concrete, 6' Grass 12'	High	40 MPH	Photos 129-132
39	**Turner Warnell**	**Calendar**	Major Intersection, Bike Trail	G	N	Y	SS	N	Incomplete	Not Wide	N	0, N	N	P	N	N	None	N	N	Incomplete	N	_	Low	30 MPH	Photos 133-134
40	**Calendar**	**Curry**	Bike Trail	G	N	Y	SS	N	Incomplete	Not Wide	N	0, N	N	P	N	N	_	N	Y	Incomplete	N	_	Low	30 MPH	Photo 135

APPENDIX G: INTERSECTION INVENTORY TABLES

Intersection Improvement Project #	Road 1	Road 2	Reason (Major intersection, school, connectivity, etc	Sight Distance (Good, Fair, Poor)	Signage (Y/N)	Controlled/ Uncontrolled	Stop Light/ Stop Sign	Curb Ramp (Y/N)	Curb Ramp (Complete/ Incomplete)	Curb Radius (Very Wide, Wide, Not Wide)	Marked Crosswalk (Y/N)	Number and Location of Crosswalks Adequate (Y/N)	Highly Visible (Y/N)	Crosswalk Condition (Good/Fair/ Poor)	Advanced Stop Line (Y/N)	Pedestrian Xing Signal (Y/N)	Type of Signal (Regular, Countdown)	Curb Extension (Y/N)	Sidewalk (Y/N)	Sidewalk Complete/Incom plete	Median island (Y/N)	Median Island Condition and Width	Estimated Traffic Volume (High/Medium/ Low)	Speed Limit	Other Notes
41	**Sublett**	**Calendar**	Bike Trail	G	N	Y	SL	Y	Complete	Wide	Y	4, Y	N	F	Y	Y	Regular	N	Y	Complete	Y	Grass, 10'	High	40 MPH	Photos 136-139
42	**Green Oaks**	**Sublett**	Bike Trail	G	N	Y	SL	Y	Complete	Wide	Y	4, Y	N	F	Y	Y	Regular	N	Y	Incomplete	Y	Grass, 15'	High	40 MPH	Photos 140-142
43	**Bardin**	**Bowen**	Major Intersection, Bike Trail	G	N	Y	SL	Y	Incomplete	Wide	Y	3, Y	N	F	Y	Y	Regular	N	Y	Complete	Y	Concrete, 4'	High	40 MPH	Photos 143-147
44	**Arbrook**	**Bowen**	Major Intersection, Bike Trail	G	N	Y	SL	Y	Incomplete	Wide	Y	3, Y	N	F	Y	Y	Regular	N	Y	Complete	N	_	High	40 MPH	Photos 148-150
45	**California**	**Bowen**	Major Intersection, Bike Trail	G	N	Y	SL	Y	Complete	Wide	Y	4, Y	N	F	Y	Y	Regular	N	Y	Incomplete	N	_	High	40 MPH	Photos 151-153
46	**Arkansas**	**Bowen**	Major Intersection Bike Trail	G	N	Y	SL	Y	Complete	Wide	Y	4, Y	N	P	Y	Y	Regular	N	Y	Complete	N	_	High	40 MPH	Photos 154-156
47	**Sherry**	**Arbrook**	Major Intersection Bike Trail	G	N	Y	SS	Y	Incomplete	Wide	N	0, N	N	P	Y	N	_	N	Y	Complete	Y	Concrete, 6'	Medium	40 MPH	Photos 157-160
48	**New York**	**Tech Center**	Major Intersection Bike Trail	G	N	Y	SS	Y	Incomplete	Wide	N	0, N	N	P	Y	N	_	N	Y	Incomplete	Y	Concrete, 4'	Medium	40 MPH	Photos 161-163
49	**New York**	**Bardin**	Major Intersection Bike Trail	G	N	Y	SL	Y	Complete	Wide	Y	4, Y	N	F	Y	Y	Regular	N	Y	Complete	Y	Concrete, 6'	High	40 MPH	Photos 164-167
50	**New York**	**High Bank**	School Bike Trail	G	N	Y	SL	Y	Complete	Not Wide	Y	4, Y	Y	F	Y	Y	Regular	N	Y	Complete	Y	Concrete, 4'	Medium	40 MPH 30 MPH	Photos 168-170
51	**New York**	**Green Oaks**	Major Intersection Bike Trail	G	N	Y	SL	Y	Complete	Very Wide	Y	4, Y	Y	F	Y	Y	Regular	N	Y	Complete	Y	Concrete, 4' Grass, 12'	High	40 MPH	Photos 171-173
52	**Sublett**	**Prescott**	School	G	Y	Y	SL	Y	Complete	Wide	Y	4, Y	Y	F	Y	Y	Regular	N	Y	Complete	Y	Grass, 8'	Medium	30 MPH School 20 MPH	Photos 174-176
53	**New York**	**South East Parkway**	Major Intersection Bike Trail	G	Y	Y	SL	Y	Complete	Wide	Y	4, Y	Y	F	Y	Y	Regular	N	Y	Complete	Y	Concrete, 4'	Medium	40 MPH	Photos 177-179
54	**New York**	**Mansfield Webb**	Major Intersection Bike Trail	F	N	Y	SL	Y	Incomplete	Not Wide	Y	1, N	N	F	Y	Y	Regular	N	Y	Incomplete	N	_	Medium	40 MPH	Photos 180-182
55	**Silo**	**Mansfield Webb**	Bike Trail	F	N	Y	SS	N	Incomplete	Not Wide	N	0, N	N	P	Y	N	_	N	N	Incomplete	N	_	Medium	40 MPH	Photos 183-184
56	**Matlock**	**Mansfield Webb**	Major Intersection Bike Trail	G	N	Y	SL	Y	Complete	Wide	Y	2, N	N	F	Y	Y	Regular	N	Y	Incomplete	Y	Grass, 20'	Medium	40 MPH	Photos 185-187
57	**Mansfield Webb**	**Bullweg**	Bike Trail	G	N	Y	SS	N	Incomplete	Not Wide	N	0, N	N	P	Y	N	_	N	Y	Incomplete	N	_	Medium	30 MPH	Photos 188-189
58	**Matlock**	**Eden**	Major Intersection Bike Trail	G	N	Y	SL	Y	Complete	Not Wide	Y	4, Y	N	F	Y	Y	Regular	N	Y	Complete	Y	Grass, 20'	Medium - High	40 MPH	Photos 190-192
59	**Silo**	**Sublett**	Major Intersection Bike Trail	G	N	Y	SL	Y	Complete	Very Wide	Y	4, Y	Y	F	Y	Y	Regular	N	Y	Incomplete	Y	Concrete, 6'	Medium	40 MPH	Photos 193-195
60	**Collins**	**South East Parkway**	Major Intersection Bike Trail	G	N	Y	SS	Y	Complete	Wide	N	0, N	N	P	Y	N	_	N	Y	Incomplete	N	_	Medium	40 MPH	Photos 196-198

APPENDIX G: INTERSECTION INVENTORY TABLES

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61	**Sublett**	**Collins**	Major Intersection	G	N	Y	SL	Y	Complete	Wide	Y	4, Y	N	P	Y	Y	Regular	N	Y	Complete	Y	Grass, 15'	Medium	45 MPH	Photos 199-200
62	**Green Oaks**	**Collins**	Major Intersection	G	N	Y	SL	Y	Complete	Wide	Y	4, Y	N	F	Y	Y	Regular	N	Y	Complete	Y	Grass, 8'	Medium	45 MPH	Photos 201-204
63	**Collins**	**Bardin**	Major Intersection	G	N	Y	SL	Y	Incomplete	Wide	N	0, N	N	P	Y	Y	Regular	N	Y	Incomplete	Y	Concrete, 3' Grass, 18'	Medium	40 MPH	Photos 205-207
64	**Matlock**	**Bardin**	Major Intersection Bike Trail	G	N	Y	SL	Y	Complete	Wide	Y	4, Y	N	F	Y	Y	Regular	N	Y	Complete	Y	Grass, 15'	Medium	40 MPH	Photos 208-211
65	**Yaupon**	**Green Oaks**	Major Intersection Bike Trail	G	N	Y	SL	Y	Complete	Wide	Y	4, Y	Y	F	Y	Y	Regular	N	Y	Complete	Y	Grass, 15'	Medium	40 MPH	Photos 212-214
66	**Yaupon**	**Cravens Park**	Major Intersection Bike Trail	G	N	Y	SL	Y	Complete	Wide	Y	1, N	Y	F	Y	N	_	N	Y	Complete	N	_	Low	30 MPH	Photos 215-217
67	**Cooper**	**Harris**	Major Intersection Bike Trail	G	N	Y	SL	Y	Incomplete	Wide	Y	4, Y	Y	F	Y	Y	Regular	N	Y	Incomplete	Y	Concrete, 4'	High	40 MPH	Photos 218-220
68	**Cooper**	**Eden**	Major Intersection	G	N	Y	SL	Y	Incomplete	Wide	Y	3, Y	N	F	Y	Y	Regular	N	Y	Incomplete	Y	Concrete, 4'	High	40 MPH	Photos 221-223
69	**Cooper**	**Sublett**	Major Intersection	G	N	Y	SL	Y	Complete	Wide	Y	4, Y	N	F	Y	Y	Regular	N	Y	Complete	Y	Concrete, 4' Grass, 12'	High	40 MPH	Photos 224-226
70	**Sublett**	**Tennessee**	Bike Trail	F	N	Y	SS	Y	Incomplete	Not Wide	N	0, N	N	P	Y	N	_	N	Y	Complete	Y	Grass, 10'	Medium	30 MPH 40 MPH	Photos 227-230
71	**Cooper**	**Nathan Low**	Major Intersection	G	N	Y	SL	Y	Complete	Wide	Y	4, Y	N	G	Y	Y	Regular	N	Y	Incomplete	Y	Concrete, 4'	High	40 MPH	Photos 231-233
72	**Caliente**	**Green Oaks**	Major Intersection Bike Trail	G	N	Y	SS	Y	Complete	Wide	N	0, N	N	P	Y	N	_	N	Y	Incomplete	Y	Grass, 10'	High	40 MPH	Photos 234-236
73	**Bardin**	**Caliente**	Bike Trial School	F	N	Y	SS	Y	Incomplete	Wide	N	0, N	N	P	Y	N	_	N	Y	Incomplete	N	_	Medium	40 MPH	Photos 237-239
74	**Park Springs**	**Indian Wells**	Bike Trial School	G	N	Y	SL	Y	Complete	Wide	N	0, N	N	P	Y	Y	Regular	N	Y	Incomplete	Y	Concrete, 4'	Medium	40 MPH	Photos 240-243
75	**Park Springs**	**Frontage**	Major Intersection	G	N	Y	SL	Y	Incomplete	Wide	Y	3, Y	N	P	Y	Y	Regular	N	Y	Incomplete	N	_	Medium	40 MPH	Photos 244-246
76	**Kelly Elliot**	**Lorraine**	Major Intersection Bike Trail	F	N	U	SS	Y	Incomplete	Not Wide	N	N	N	P	N	N	_	N	Y	Complete	N	_	Medium	40 MPH	Photos 247-249
77	**Kelly Elliot**	**Green Oaks**	Major Intersection Bike Trail	F	N	U	SS	Y	Incomplete	Not Wide	N	N	N	P	N	N	_	N	Y	Complete	N	_	Medium	40 MPH	Photos 250-251
78	**Kelly Elliot**	**Green Oaks**	Major Intersection Bike Trail	G	N	C	SL	Y	Incomplete	Not Wide	Y	0, N	N	P	Y	Y	Regular	N	Y	Complete	Y	Grass, 12'	High	40 MPH	Crosswalk through Median Photos 252-258
79	**Kelly Elliot**	**Sublett**	Major Intersection Bike Trail	G	N	C	SL	Y	Complete	Not Wide	Y	Y	N	P	Y	Y	Regular	N	Y	Complete	Y	Concrete, 5'	High	40 MPH	Photos 259-261
80	**Kelly Elliot**	**Gentle Springs**	Bike Trail	F	N	U	SS	Y	Incomplete	Not Wide	Y	Y	N	F	Y	N	_	N	Y	Complete	N	_	Low	30 MPH	Photos 262-263

APPENDIX G: INTERSECTION INVENTORY TABLES

Intersection Improvement Project #	Road 1	Road 2	Reason (Major intersection, school, connectivity, etc	Sight Distance (Good, Fair, Poor)	Signage (Y/N)	Controlled/ Uncontrolled	Stop Light/ Stop Sign	Curb Ramp (Y/N)	Curb Ramp (Complete/ Incomplete)	Curb Radius (Very Wide, Wide, Not Wide)	Marked Crosswalk (Y/N)	Number and Location of Crosswalks Adequate (Y/N)	Highly Visible (Y/N)	Crosswalk Condition (Good/Fair/ Poor)	Advanced Stop Line (Y/N)	Pedestrian Xing Signal (Y/N)	Type of Signal (Regular, Countdown)	Curb Extension (Y/N)	Sidewalk (Y/N)	Sidewalk Complete/Incom plete	Median island (Y/N)	Median Island Condition and Width	Estimated Traffic Volume (High/Medium/ Low)	Speed Limit	Other Notes
81	**287**	**Kenedale**	Bike Trail	G	N	C	SL	N	Incomplete	Wide	N	N	N	P	Y	Y	Regular	N	N	Incomplete	N	_	High	40 MPH	Photos 264-266
82	**Eden**	**MLK Park**	Bike Trail	G	N	U	SS	Y	Incomplete	Not Wide	N	N	N	P	Y	N	_	N	Y	Incomplete	Y	Grass, 10'	Low	35 MPH	Photos 267-270
83	**Bowman Springs**	**Royal Gate**	Bike Trail	F	N	U	SS	N	Incomplete	Not Wide	N	N	N	P	N	N	_	N	Y	Incomplete	N	_	Medium	30 MPH	Photos 271-274
84	**Royal Gate**	**Shorewood**	Bike Trail	F	N	U	SS	Y	Incomplete	Not Wide	N	N	N	P	N	N	_	N	Y	Complete	N	_	Low	30 MPH	Photos 275-278
85	**Poly Web**	**Sherwood**	Bike Trail	G	N	U	SS	Y	Incomplete	Not Wide	N	N	N	P	Y	N	_	N	Y	Incomplete	Y	Grass & Concrete, 10'	Low	30 MPH	Photos 279-281
86	**Bowman Springs**	**Poly Web**	Bike Trail	F	N	U	SS	N	Incomplete	Wide	Y	N	N	P	Y	N	_	N	Y	Incomplete	N	_	Low	30 MPH	Photos 282-284
87	**Poly Web**	**Pleasant Ridge**	Major Intersection, School	G	Y	U	SS	Y	Incomplete	Not Wide	Y	Y	Y	F	Y	N	_	N	Y	Complete	Y	Grass, 10'	Medium	40 MPH	Photos 285-288
88	**Perkins**	**Pleasant Ridge**	Major Intersection, Church	G	Y	C	SL	Y	Incomplete	Not Wide	Y	Y	Y	F	Y	Y	Regular	N	Y	Complete	N	_	High	40 MPH	Photos 289-291
89	**Perkins**	**Shorewood**	Bike Trail	G	N	U	SS	Y	Incomplete	Not Wide	N	N	N	P	N	N	_	N	Y	Complete	N	_	Medium	40 MPH	Photos 292-295
90	**Waterview**	**Perkins**	Major Intersection, Bike Trail	F	Y	U	SS	Y	Incomplete	Not Wide	Y	N	N	P	Y	N	_	N	Y	Incomplete	Y	Grass, 20'	Medium	40 MPH	Photos 296-299
91	**Perkins**	**Arkansas**	Neighborhood Connectivity, Park	G	N	U	SS	Y	Incomplete	Not Wide	N	0, N	Y	P	N	N	_	N	Y	Complete	N	_	Medium	40 MPH	Park, Potential Neighborhood Trailhead; Photos 300-303
92	**Arkansas**	**Green Oaks**	Major Intersection	G	N	C	SL	Y	Incomplete	Very Wide	Y	4, Y	Y	G	Y	Y	Regular	N	Y	Complete	Y	Concrete, 4'	Medium	40 MPH	Photos 304-307
93	**Waterview**	**Green Oaks**	School	G	Y	C	SL	Y	Complete	Wide	Y	4, Y	Y	F	Y	Y	Regular	N	Y	Complete	Y	Concrete, 6'	Medium	40 MPH	Photos 308-310
94	**Pleasant Ridge**	**Green Oaks**	Major Intersection	G	N	C	SL	Y	Complete	Wide	Y	4, Y	Y	F	Y	Y	Regular	N	Y	Complete	Y	Concrete, 6'	High	40 MPH	Photos 311-313
95	**Woodside**	**Pleasant Ridge**	School	G	N	C	SL	N	Incomplete	Not Wide	Y	4, Y	Y	P	Y	Y	Regular	N	Y	Complete	N	_	High	40 MPH	Photos 314-315
96	**Woodside**	**Mayfield**	School Bike Trail	F	N	U	SS	N	Incomplete	Not Wide	Y	4, Y	Y	F	Y	N	_	N	Y	Incomplete	N	_	Medium	40 MPH 30 MPH	Photos 316-319
97	**Woodside**	**Rushmore**	Bike Trail	F	N	U	SS	Y	Complete	Not Wide	N	0, N	Y	P	N	N	_	N	Y	Complete	N	_	Low	30 MPH	Photos 320-322
98	**Arkansas**	**Woodside**	School	F	N	C	SL	Y	Incomplete	Wide	Y	4, Y	Y	F	Y	Y	Regular	N	Y	Complete	Y	Concrete, 2'	Medium	40 MPH	Photos 323-325
99	**Arkansas**	**Spanish Trail**	Park	G	Y	C	SL	Y	Incomplete	Wide	Y	4, Y	Y	P	Y	Y	Regular	N	Y	Incomplete	Y	Concrete, 3'	Medium	40 MPH	Photos 326-329
100	**Green Oaks**	**303**	Major Intersection	G	N	C	SL	Y	Complete	Wide	Y	4, Y	N	F	Y	Y	Regular	N	Y	Incomplete	Y	Concrete, 4'	High	40 MPH	Photos 330-334

APPENDIX G: INTERSECTION INVENTORY TABLES

Intersection Improvement Project #	Road 1	Road 2	Reason (Major intersection, school, connectivity, etc	Sight Distance (Good, Fair, Poor)	Signage (Y/N)	Controlled/ Uncontrolled	Stop Light/ Stop Sign	Curb Ramp (Y/N)	Curb Ramp (Complete/ Incomplete)	Curb Radius (Very Wide, Wide, Not Wide)	Marked Crosswalk (Y/N)	Number and Location of Crosswalks Adequate (Y/N)	Highly Visible (Y/N)	Crosswalk Condition (Good/Fair/ Poor)	Advanced Stop Line (Y/N)	Pedestrian Xing Signal (Y/N)	Type of Signal (Regular, Countdown)	Curb Extension (Y/N)	Sidewalk (Y/N)	Sidewalk Complete/Incom plete	Median island (Y/N)	Median Island Condition and Width	Estimated Traffic Volume (High/Medium/ Low)	Speed Limit	Other Notes
101	**Bowen**	**Park Row**	Major Intersection	G	N	C	SL	Y	Complete	Not Wide	Y	4, Y	N	F	Y	Y	Regular	N	Y	Incomplete	N	_	High	40 MPH	Photos 335-337
102	**Bowen**	**Norwood**	Bike Trail	G	N	C	SL	Y	Incomplete	Not Wide	Y	4, Y	N	F	Y	Y	Regular	N	Y	Incomplete	N	_	High	35 MPH	Photos 338-340
103	**Fielder**	**Norwood**	Bike Trail	F	N	C	SL	N	Incomplete	Not Wide	Y	2, N	Y	P	Y	Y	Regular	N	N	Incomplete	N	_	Medium	35 MPH	Photos 341-343
104	**Fielder**	**Park Row**	School	F	N	C	SL	Y	Incomplete	Wide	N	0, N	N	P	N	Y	Regular	N	Y	Complete	N	_	High	35 MPH	Photos 344-347
105	**Fielder**	**Tucker**	Bike Trail Minor Intersection	F	Y	C	SL	Y	Complete	Wide	Y	4, Y	Y	P	Y	Y	Regular	N	Y	Incomplete	N	_	Medium	35 MPH	Photos 348-350
106	**Tucker**	**Davis**	School Bike Trail	F	N	U	SS	N	I	Not Wide	Y	N	N	F	Y	N	_	N	Y	Incomplete	N	_	Medium	35 MPH	Photos 351-356
107	**Park Row**	**Davis**	School	F	Y	C	SL	Y	I	Wide	Y	N	N	P	Y	Y	Regular	N	Y	Incomplete	N	_	High	40 MPH	Photos 357-359
108	**Mitchell**	**Davis**		G	Y	C	SL	Y	Complete	Not Wide	Y	Y	N	F	Y	Y	Regular	N	Y	Complete	N	_	Medium	35 MPH	Photos 360-362
109	**Second**	**Davis**		F	Y	C	SL	Y	I	Not Wide	Y	N	N	P	Y	Y	Regular	N	Y	Incomplete	N	_	Medium	35 MPH	Photos 363-365
110	**Division**	**Davis**	Major Intersection Bike Trail	G	N	Y	SL	Y	Complete	Not Wide	Y	Y	N	F	Y	Y	Regular	N	Y	Incomplete	N	_	High	40 MPH	Photos 366
111	**Abram**	**Davis**		G	N	C	SL	Y	I	Not Wide	Y	N	N	F	Y	Y	Regular	N	Y	Incomplete	N	_	Medium	35 MPH	Photos 367-370
112	**Sanford**	**Davis**	Bike Trail	F	N	C	SL	Y	I	Not Wide	Y	Y	N	F	Y	Y	Regular	N	Y	Incomplete	N	_	Medium	30 MPH	Photos 371-373
113	**Randol Mill**	**Davis**	Bike Trail	G	N	C	SL	Y	Complete	Not Wide	Y	Y	Y	G	Y	Y	Regular	N	Y	Complete	Y	_	Medium	40 MPH	Photos 374-375
114	**Road to Six Flags**	**Davis**	Bike Trail	G	N	C	SL	Y	I	Not Wide	Y	N	N	P	Y	Y	Regular	N	Y	Incomplete	Y	Concrete, 12'	Medium	40 MPH	Photos 376-378
115	**Fielder**	**Randol Mill**	Bike Trail	G	N	Y	SL	Y	Complete	Wide	Y	Y	N	F	Y	Y	Regular	N	Y	Complete	N	_	High	40 MPH	Photos 379-383
116	**Randol Mill Park**	**Randol Mill**	Park Bike Trail	G	N	C	SL	Y	I	Not Wide	N	N	N	P	Y	Y	Regular	N	Y	Incomplete	Y	Pavers, 10'	Medium	40 MPH	Photos 384-386
117	**Westwood**	**Bowen**		F	N	U	SS	Y	I	Not Wide	N	N	N	P	Y	N	_	N	Y	Incomplete	N	_	Medium	30 MPH	Photos 387-388
118	**Division**	**Bowen**	Park Bike Trail	F	N	C	SL	Y	I	Not Wide	Y	N	N	F	Y	Y	Regular	N	Y	Incomplete	N	_	High	40 MPH	Photos 389-392
119	**Oakwood**	**Sanford**	Bike Trail	F	N	U	SS	N	I	Not Wide	N	N	N	P	Y	N	_	N	Y	Incomplete	N	_	Medium	35 MPH	Photos 393-395
120	**Fielder**	**Sanford**	Bike Trail	F	N	C	SL	Y	I	Not Wide	Y	N	N	P	Y	Y	Regular	N	Y	Incomplete	N	_	Medium	35 MPH	Photos 396-398

APPENDIX G: INTERSECTION INVENTORY TABLES

Intersection Improvement Project #	Road 1	Road 2	Reason (Major intersection, school, connectivity, etc	Sight Distance (Good, Fair, Poor)	Signage (Y/N)	Controlled/ Uncontrolled	Stop Light/ Stop Sign	Curb Ramp (Y/N)	Curb Ramp (Complete/ Incomplete)	Curb Radius (Very Wide, Wide, Not Wide)	Marked Crosswalk (Y/N)	Number and Location of Crosswalks Adequate (Y/N)	Highly Visible (Y/N)	Crosswalk Condition (Good/Fair/ Poor)	Advanced Stop Line (Y/N)	Pedestrian Xing Signal (Y/N)	Type of Signal (Regular, Countdown)	Curb Extension (Y/N)	Sidewalk (Y/N)	Sidewalk Complete/Incom plete	Median island (Y/N)	Median Island Condition and Width	Estimated Traffic Volume (High/Medium/ Low)	Speed Limit	Other Notes
121	**Lamar**	**Davis**	Bike Trail	G	N	C	SL	Y	I	Not Wide	Y	N	Y	F	Y	Y	Regular	N	Y	I	Y	Grass, 12'	High	40 MPH	Photos 399-402
122	**Bert**	**Davis**	School	G	N	U	SS	Y	I	Not Wide	N	N	N	P	N	N	_	N	Y	C	Y	Concrete, 8'	High	40 MPH	Photos 403-405
123	**Green Oaks**	**Davis**	Bike Trail	G	N	C	SL	Y	I	Not Wide	Y	Y	N	F	Y	Y	Regular	N	Y	C	Y	Grass, 8'	High	40 MPH	Photos 406-408
124	**Fielder**	**Green Oaks**	Major Intersection	G	N	C	SL	Y	I	Not Wide	N	N	N	P	Y	Y	Regular	N	Y	C	Y	Grass, 8'	High	40 MPH	Photos 409-411
125	**Fielder**	**Lamar**	School	G	N	C	SL	Y	I	Not Wide	Y	Y	Y	F	Y	Y	Regular	N	Y	C	Y	Grass, 12'	High	40 MPH	Photos 412-415
126	**Cooper**	**Lamar**	Bike Trail	F	N	C	SL	Y	I	Not Wide	Y	N	N	F	Y	Y	Regular	N	Y	C	Y	Grass, 12'	high	40 MPH	Photos 416-419
127	**Cooper**	**Washington**	Bike Trail	F	N	C	SL	Y	I	Not Wide	Y	Y	N	P	Y	Y	Regular	N	Y	C	N	_	Medium	40 MPH	Photos 420-422
128	**Cooper**	**Green Oaks**	Park	G	N	C	SL	Y	I	Not Wide	Y	N	N	P	Y	Y	Regular	N	Y	C	Y	Grass, 5'	High	40 MPH	Photos 423-426
129	**Lincoln**	**Green Oaks**	School Bike Trail	G	N	C	SL	C	I	Not Wide	Y	Y	Y	F	Y	Y	Regular	N	Y	I	Y	Grass, 15'	Medium	40 MPH	Photos 427-429
130	**Lincoln**	**Brown**	Bike Trail	G	Y	U	SS	Y	I	Not Wide	Y	N	Y	P	Y	N	_	N	Y	C	N	_	Medium	40 MPH	Photos 430-431
131	**Lincoln**	**Washington**	Bike Trail	F	N	U	SS	Y	I	Not Wide	N	N	N	P	Y	N	_	N	Y	I	N	_	Medium	40 MPH	Photos 432-433
132	**Lincoln**	**Lamar**	Major Intersection Bike Trail	F	N	C	SL	Y	I	Not Wide	Y	N	N	F	Y	Y	Regular	N	Y	I	Y	Grass, 20'	High	40 MPH	Photos 434-436
133	**Collins**	**Lamar**	Bike Trail	F	N	C	SL	Y	I	Not Wide	Y	Y	N	F	Y	Y	Regular	N	Y	C	Y	Concrete, 5'	High	40 MPH	Photos 437-440
134	**Collins**	**Brown**	Bike Trail	F	N	C	SL	Y	I	Not Wide	Y	N	N	F	Y	Y	Regular	N	Y	I	N	_	High	40 MPH	Photos 441-445
135	**Collins**	**Green Oaks**	Major Intersection	G	N	C	SL	Y	I	Not Wide	Y	N	N	F	Y	Y	Regular	N	Y	I	Y	Grass, 12'	High	40 MPH	Photos 446-448
136	**Green Oaks**	**Winding Hollow**	Park	G	N	U	SS	Y	I	Not Wide	N	N	N	P	N	N	_	N	Y	C	Y	Grass,12'	High	40 MPH	Need Ramps Photos 449-452
137	**Green Oaks**	**Ball Park Way**	School	G	N	C	SL	Y	I	Not Wide	Y	N	Y	G	Y	Y	Regular	N	Y	I	Y	Grass,12'	High	40 MPH	Photos 453-456
138	**Brown**	**Ball Park Way**	Bike Trail	G	Y	C	SL	Y	I	Not Wide	Y	Y	Y	P	Y	Y	Regular	N	Y	Y	Y	Concrete, 8'	High	40 MPH	Photos 457-459
139	**Ball Park Way**	**Lamar**	Major Intersection	F	N	C	SL	Y	I	Not Wide	Y	N	N	P	Y	Y	Regular	N	Y	I	Y	Concrete, 8'	High	40 MPH	Photos 460-465
140	**Cooper**	**Randol Mill**	Major Intersection Bike Trail	F	N	C	SL	Y	C	Not Wide	Y	Y	N	F	Y	Y	Regular	N	Y	C	N	_	High	35 MPH	Photos 466-469

APPENDIX G: INTERSECTION INVENTORY TABLES

Intersection Improvement Project #	Road 1	Road 2	Reason (Major intersection, school, connectivity, etc	Sight Distance (Good, Fair, Poor)	Signage (Y/N)	Controlled/ Uncontrolled	Stop Light/ Stop Sign	Curb Ramp (Y/N)	Curb Ramp (Complete/ Incomplete)	Curb Radius (Very Wide, Wide, Not Wide)	Marked Crosswalk (Y/N)	Number and Location of Crosswalks Adequate (Y/N)	Highly Visible (Y/N)	Crosswalk Condition (Good/Fair/ Poor)	Advanced Stop Line (Y/N)	Pedestrian Xing Signal (Y/N)	Type of Signal (Regular, Countdown)	Curb Extension (Y/N)	Sidewalk (Y/N)	Sidewalk Complete/Incom plete	Median island (Y/N)	Median Island Condition and Width	Estimated Traffic Volume (High/Medium/ Low)	Speed Limit	Other Notes
141	**Cooper**	**I-30 South Side**	Major Intersection	F	Y	C	SL	Y	I	Not Wide	Y	Y	N	F	Y	Y	Regular	N	Y	C	N	_	High	35 MPH	Photos 470-475
142	**Cooper**	**Sanford**	Major Intersection	G	N	C	SL	Y	I	Not Wide	Y	N	N	F	Y	Y	Regular	N	Y	C	Y	Concrete, 8'	High	35 MPH	Photos 476-480
143	**Cooper**	**Division**	Major Intersection	G	N	C	SL	Y	I	Not Wide	Y	Y	N	F	Y	Y	Regular	N	Y	C	Y	Concrete, 8'	High	35 MPH	Photos 481-485
144	**Cooper**	**Abram**	Major Intersection	G	N	C	SL	Y	I	Not Wide	Y	Y	N	F	Y	Y	Regular	N	Y	C	N	_	High	35 MPH	Photos 486-489
145	**Cooper**	**Park Row**	Major Intersection School	G	N	C	SL	Y	I	Not Wide	Y	Y	Y	F	Y	Y	Regular	N	Y	I	N	_	High	35 MPH	Photos 490-496
146	**Cooper**	**Inwood**	Major Intersection	G	N	C	SL	Y	C	Not Wide	Y	Y	Y	G	Y	Y	Regular	N	Y	C	N	_	High	35 MPH	Photos 497-500
147	**Center**	**Tucker**		G	N	U	SS	Y	I	Not Wide	N	N	N	P	N	N	_	N	Y	C	Y	Grass,12'	Medium	35 MPH	Photos 501-504
148	**Center**	**Park Row**	Bike Trail	G	N	C	SL	Y	I	Not Wide	Y	N	N	P	Y	Y	Regular	N	Y	C	N	_	High	35 MPH	Photos 505-510
149	**Center**	**Mitchell**	Bike Trail	F	N	U	SS	Y	I	Not Wide	Y	Y	N	P	Y	N	_	N	Y	I	N	_	Medium	35 MPH	Photos 511-515
150	**Mesquite**	**Border**	Downtown Bike Trail	G	N	U	SS	Y	I	Not Wide	Y	Y	N	P	Y	N	_	N	Y	C	N	_	Medium	35 MPH	Photos 516-518
151	**Mesquite**	**Abram**	Downtown	G	N	C	SL	Y	C	Not Wide	Y	Y	N	F	Y	Y	Regular	N	Y	C	N	_	Medium	35 MPH	Photos 519-522
152	**Mesquite**	**Division**	Downtown	G	N	C	SL	Y	I	Not Wide	Y	N	N	F	Y	Y	Regular	N	Y	I	N	_	Medium	35 MPH	Photos 523-525
153	**Mesquite**	**Sanford**	Downtown School	G	Y	N	SS	Y	I	Not Wide	Y	Y	Y	G	Y	N	_	N	Y	C	N	_	Medium	35 MPH	Photos 526-528
154	**Center**	**Road to Six Flags**	Bike Trail	G	N	C	SL	Y	C	Not Wide	Y	Y	N	P	Y	Y	Regular	N	Y	C	N	_	High	35 MPH	Photos 529-533
155	**Center**	**Randol Mill**	Downtown Bike Trail	G	N	C	SL	Y	C	Not Wide	Y	Y	Y	F	Y	Y	Regular	N	Y	C	N	_	High	35 MPH	Photos 534-538
156	**Center**	**Sanford**	Downtown	G	N	C	SL	Y	I	Not Wide	Y	N	Y	P	Y	Y	Regular	N	Y	C	N	_	Medium	35 MPH	Photos 539-542
157	**Center**	**Division**	Downtown	G	N	C	SL	Y	I	Not Wide	Y	N	Y	G	Y	Y	Regular	N	Y	C	N	_	High	35 MPH	Photos 543-546
158	**Center**	**1st**	Downtown	GY	N	C	SL	Y	C	Not Wide	Y	Y	N	G	Y	Y	Regular	N	Y	C	N	_	High	35 MPH	Photos 547-550
159	**Center**	**Barden**	Downtown	G	N	C	SL	Y	C	Not Wide	Y	N	N	F	Y	Y	Regular	N	Y	C	N	_	High	35 MPH	Photos 551-555
160	**Collins**	**Pioneer**	Major Intersection	G	N	C	SL	Y	I	Not Wide	Y	Y	N	P	Y	Y	Regular	N	Y	I	N	_	High	40 MPH	Photos 556-562

APPENDIX G: INTERSECTION INVENTORY TABLES

Intersection Improvement Project #	Road 1	Road 2	Reason (Major intersection, school, connectivity, etc	Sight Distance (Good, Fair, Poor)	Signage (Y/N)	Controlled/ Uncontrolled	Stop Light/ Stop Sign	Curb Ramp (Y/N)	Curb Ramp (Complete/ Incomplete)	Curb Radius (Very Wide, Wide, Not Wide)	Marked Crosswalk (Y/N)	Number and Location of Crosswalks Adequate (Y/N)	Highly Visible (Y/N)	Crosswalk Condition (Good/Fair/ Poor)	Advanced Stop Line (Y/N)	Pedestrian Xing Signal (Y/N)	Type of Signal (Regular, Countdown)	Curb Extension (Y/N)	Sidewalk (Y/N)	Sidewalk Complete/Incom plete	Median island (Y/N)	Median Island Condition and Width	Estimated Traffic Volume (High/Medium/ Low)	Speed Limit	Other Notes
161	**Collins**	**Lovers Lane**	School	G	Y	C	SL	Y	I	Not Wide	Y	N	Y	F	Y	Y	Regular	N	Y	C	N	_	High	40 MPH	Photos 563-565
162	**Collins**	**Park Row**	Major Intersection	G	N	C	SL	Y	I	Not Wide	Y	Y	N	P	Y	Y	Regular	N	Y	C	N	_	High	40 MPH	Photos 566-569
163	**Collins**	**Mitchell**	Major Intersection	G	N	C	SL	Y	I	Not Wide	Y	Y	N	P	Y	Y	Regular	N	Y	C	N	_	High	40 MPH	Photos 570-574
164	**Collins**	**Abram**	Major Intersection	G	N	C	SL	Y	I	Not Wide	Y	Y	N	P	Y	Y	Regular	N	Y	C	N	_	High	40 MPH	Photos 575-580
165	**Collins**	**Sanford**	Major Intersection, Bike Trail, Stadium	G	N	C	SL	Y	I	Not Wide	Y	N	N	P	Y	Y	Regular	N	Y	I	N	_	Medium	40 MPH	Photos 581-583
166	**Randol Mill**	**Collins**	Major Intersection, Bike Trail, Stadium	G	N	C	SL	Y	I	Not Wide	Y	Y	N	P	Y	Y	Regular	N	Y	C	N	_	High	35 MPH	Photos 584-586
167	**Collins**	**Road to Six Flags**	Major Intersection, Bike Trail, Stadium	G	N	C	SL	Y	I	Not Wide	Y	Y	N	P	Y	Y	Regular	N	Y	I	N	_	High	35 MPH	Photos 587-589
168	**Stadium**	**Randol Mill**	Stadium	G	N	C	SL	Y	C	Not Wide	Y	Y	Y	G	Y	Y	Regular	N	Y	C	Y	Concrete, 5'	High	35 MPH	Photos 590-593
169	**Stadium**	**Abram**	Bike Trail, Major Intersection	G	N	C	SL	Y	I	Not Wide	Y	Y	N	P	Y	Y	Regular	N	Y	C	Y	Concrete, 8'	High	35 MPH	Photos 594-597
170	**Browning/ Stadium**	**Park Row**		G	N	C	SL	Y	I	Not Wide	Y	Y	N	P	Y	Y	Regular	N	Y	C	N	_	High	30 MPH 40 MPH	Photos 598-600
171	**Browning**	**Lovers Lane**	School	G	N	U	SS	Y	I	Not Wide	Y	Y	Y	P	Y	N	_	N	Y	C	N	_	Medium	30 MPH	Photos 601-603
172	**Browning**	**303**	School	G	Y	C	SL	Y	I	Not Wide	Y	Y	N	F	Y	Y	Regular	N	Y	I	Y	Concrete, 5'	High	30 MPH 40 MPH	Photos 604-610
173	**303**	**New York**	School, Major Intersection	G	Y	C	SL	Y	I	Not Wide	Y	Y	Y	F	Y	Y	Regular	N	Y	C	N	_	High	40 MPH	Photos 611-615
174	**New York**	**Lovers Lane**	School	G	Y	U	SS	Y	I	Not Wide	N	N	N	P	Y	N	_	N	Y	C	N	_	Medium	40 MPH	Photos 616-619
175	**New York**	**Park Row**	Major Intersection	G	N	C	SL	Y	I	Not Wide	Y	Y	N	P	Y	Y	Regular	N	Y	C	N	_	Medium	40 MPH	Photos 620-623
176	**New York**	**Mitchell**	Bike Trail	G	N	C	SL	Y	I	Not Wide	Y	Y	N	P	Y	Y	Regular	N	Y	C	N	_	Medium	35 MPH	Photos 624-627
177	**Abram**	**Sherry**	Bike Trail	G	N	C	SL	N	I	Not Wide	N	N	N	P	Y	Y	Regular	N	Y	I	Y	Grass, 5'	High	35 MPH	Photos 628-630
178	**Sherry**	**Mitchell**	School, Bike Trail	G	Y	U	SS	Y	I	Not Wide	N	N	N	P	N	N	_	N	Y	I	N	_	Low	35 MPH	Photos 631-634
179	**Sherry**	**Park Row**	School, Bike Trail	G	Y	C	SL	Y	I	Not Wide	Y	Y	Y	P	Y	Y	Regular	N	Y	I	N	_	High	35 MPH	Photos 635-638
180	**Sherry**	**Craig Hanking**	School, Bike Trail	G	Y	U	SS	Y	C	Not Wide	M	Y	Y	P	Y	N	_	N	Y	C	N	_	Medium	35 MPH	Photos 639-640

APPENDIX G: INTERSECTION INVENTORY TABLES

Intersection Improvement Project #	Road 1	Road 2	Reason (Major intersection, school, connectivity, etc	Sight Distance (Good, Fair, Poor)	Signage (Y/N)	Controlled/ Uncontrolled	Stop Light/ Stop Sign	Curb Ramp (Y/N)	Curb Ramp (Complete/ Incomplete)	Curb Radius (Very Wide, Wide, Not Wide)	Marked Crosswalk (Y/N)	Number and Location of Crosswalks Adequate (Y/N)	Highly Visible (Y/N)	Crosswalk Condition (Good/Fair/ Poor)	Advanced Stop Line (Y/N)	Pedestrian Xing Signal (Y/N)	Type of Signal (Regular, Countdown)	Curb Extension (Y/N)	Sidewalk (Y/N)	Sidewalk Complete/Incom plete	Median island (Y/N)	Median Island Condition and Width	Estimated Traffic Volume (High/Medium/ Low)	Speed Limit	Other Notes
181	**303**	**Forum**	Bike Trail	G	N	U	SS	N	I	Not Wide	N	N	N	P	N	N	_	N	N	I	Y	Grass, 10'	High	35 MPH	10' Grass Median, Photos 641-644
182	**Susan**	**Park Row**	Bike Trail	F	N	C	SL	Y	I	Not Wide	Y	Y	Y	P	Y	Y	Regular	N	Y	I	N	_	High	35 MPH	Photos 645-650
183	**Susan**	**San Frando**	Bike Trail, School, Park	F	Y	U	SS	Y	I	Not Wide	N	N	N	P	N	N	_	N	Y	I	N	_	Medium	30 MPH	Photos 651-653
184	**360**	**Mitchell**	Bike Trail	F	N	U	SS	Y	I	Not Wide	N	N	N	P	Y	N	_	N	Y	I	N	_	High	30 MPH 50 MPH	Photos 654-657
185	**Division**	**109**	Bike Trail	G	N	C	SL	N	I	Not Wide	N	N	N	P	Y	Y	Regular	N	N	I	N	_	High	40 MPH	Photos 658-661
186	**Randol Mill**	**109**	Bike Trail	G	N	U	SL	Y	I	Wide	N	N	N	P	Y	N	_	N	N	I	Y	20'	High	40 MPH	Photos 662-667
187	**Randol Mill**	**360**	Bike Trail	G	N	C	SL	Y	I	Not Wide	Y	N	N	P	Y	Y	Regular	N	Y	I	Y	Pavers, 15'	High	40 MPH	Photos 668-675
188	**California**	**Cooper**	Bike Trail, Major Intersection	G	N	C	SL	Y	I	Not Wide	Y	Y	N	F	Y	Y	Regular	N	Y	I	N	_	High	40 MPH	Photos 676-680
189	**Handisty**	**Parkside Lane**	Park	G	N	U	SS	Y	I	Not Wide	N	N	N	P	N	N	_	N	Y	C	N	_	Low	30 MPH	Photos 681-684
190	**Lynn Creek**	**Matlock**	Park, Major Intersection	G	N	C	SL	Y	C	Not Wide	Y	N	N	P	Y	Y	Regular	N	Y	C	Y	Pavers, 15'	High	30 MPH 40 MPH	Photos 685-690

APPENDIX F: INTERSECTION RECOMMENDATION TABLES

Intersection Improvement Project #	Road 1	Road 2	Needs Sidewalk (Y/N)	Stripe New Crosswalk Markings (Y/N)	Restripe Existing Crosswalk Markings (Y/N)	Advanced Stop Lines (Y/N)	Reconstruct Existing Curb Ramps (Y/N)	Construct New Curb Ramps (Y/N)	Median Refuge Islands (Y/N)	Curb Extensions (Y/N)	Reduce Turning Radius (Y/N)	Pedestrian Countdown Signal Heads (Y/N)	Restrict Right turn on Red	High - Visibility Pedestrian Warning Signs	In-Roadway Pedestrian Crossing Signs	Remove Sight-Distance Obstruction	Pedestrian Underpass/ Overpass	Details and Extra Notes
1	Mayfield	Carter	N	N	Y	Y	Y	N	N	N	N	Y	N	N	N	N	N	School Zone Photos 1-4
2	Legend	Overbrook	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Photos 5-6
3	Sherry	Overbrook	N	N	Y	Y	N	N	N	N	N	N	N	N	N	N	N	Photos 7-8
4	Billy Stewart	Timberview	N	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	N	Need Sidewalk along Timberview Photos 9-10
5	Sherry	Timberview	N	N	Y	Y	N	N	N	N	N	N	N	N	N	N	N	Photos 11-12
6	New York	Arkansas	N	N	Y	Y	N	N	Y	N	N	Y	N	N	N	Y	N	Construct block / ladder crosswalks Photos 13-15
7	Daniel	Arkansas	N	N	Y	Y	Y	Y	Y	N	N	Y	N	N	N	N	N	Photos 16-22
8	Daniel	Arkansas	N	N	N	N	N	N	Y	N	N	Y	N	N	N	N	N	Photos 23-25
9	Daniel	Timberview	Y	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	Photos 26-27
10	Daniel	Rambler	N	Y	_	Y	N	N	N	N	N	N	N	N	N	N	N	Photos 28-29
11	Mayfield	Allen	N	Y	_	Y	Y	N	Y	N	N	N	N	N	N	N	N	Photos 30-32
12	Mayfield	Daniel	N	Y	Y	Y	N	N	Y	N	N	N	N	N	N	N	N	Photos 33-35
13	Mayfield	Collins	N	N	Y	Y	N	N	Y	N	N	Y	N	N	N	N	N	Photos 36-39
14	Center	Arbrook	Y	N	Y	Y	Y	N	Y	N	N	Y	N	N	N	N	N	Photos 40-43
15	Arbrook	Matlock	N	N	Y	Y	N	N	Y	N	N	Y	N	N	N	N	N	Photos 44-48
16	Matlock	Mayfield	N	N	Y	Y	N	N	Y	N	N	Y	N	N	N	N	N	Photos 49-51
17	Omega	Mayfield	N	Y	_	_	Y	_	N	N	N	N	N	N	N	N	N	Photos 52-54
18	Center	Mayfield	N	N	Y	Y	N	N	N	N	N	N	N	N	N	N	N	Photos 55-58
19	Center	Cavendish	Y	Y	_	Y	N	Y	N	N	N	N	N	N	N	N	N	Need Crosswalk to Park Center Photos 59-62
20	Center	Timberview	Y	N	Y	Y	N	N	N	N	N	N	N	N	N	N	N	Photos 63-65

APPENDIX G: INTERSECTION RECOMMENDATION TABLES

Intersection Improvement Project #	Road 1	Road 2	Needs Sidewalk (Y/N)	Stripe New Crosswalk Markings (Y/N)	Restripe Existing Crosswalk Markings (Y/N)	Advanced Stop Lines (Y/N)	Reconstruct Existing Curb Ramps (Y/N)	Construct New Curb Ramps (Y/N)	Median Refuge Islands (Y/N)	Curb Extensions (Y/N)	Reduce Turning Radius (Y/N)	Pedestrian Countdown Signal Heads (Y/N)	Restrict Right turn on Red	High - Visibility Pedestrian Warning Signs	In-Roadway Pedestrian Crossing Signs	Remove Sight-Distance Obstruction	Pedestrian Underpass/ Overpass	Details and Extra Notes
21	Center	Arkansas	N	N	Y	Y	N	N	N	N	N	N	N	N	N	N	N	Photos 66-69
22	Cooper	303	Y	N	Y	Y	Y	N	Y	N	N	Y	N	Y	Y	N	N	Photos 70-76
23	Arkansas	Davis	Y	N	Y	Y	Y	N	N	N	N	Y	N	N	N	N	N	Near YMCA Photos 77-79
24	Arkansas	Medlin	N	N	Y	Y	Y	Y	N	N	N	Y	N	N	N	N	N	Photos 80-84
25	Medlin	California	Y	Y	_	Y	Y	Y	N	N	N	N	N	N	N	N	N	Photos 85-88
26	Fielder	California	Y	N	Y	Y	N	N	N	N	N	Y	N	N	N	N	N	Photos 89-91
27	Paisley	Cannongate	Y	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	N	Photos 92-93
28	Mayfield	Fielder	Y	N	Y	Y	N	N	N	N	N	Y	N	N	N	N	N	Photos 94-96
29	Mayfield	Cooper	Y	N	Y	Y	Y	Y	N	N	N	Y	N	Y	Y	N	N	Photos 97-100
30	Arbrook	High Point	Y	Y	Y	Y	N	Y	Y	N	N	Y	N	N	N	N	N	Photos 101-105
31	Cooper	Wimbledon	N	N	Y	Y	N	N	N	N	N	Y	N	N	N	N	N	Photos 106-108
32	Green Oaks	Matlock	N	N	Y	Y	N	N	Y	N	N	Y	N	N	N	N	N	Photos 109-112
33	Nathan Lowe	Matlock	Y	Y	N	N	Y	Y	Y	N	N	N	N	N	N	N	N	Photos 113-115
34	Sublett	Matlock	N	Y	Y	Y	N	N	Y	N	N	Y	N	N	N	N	N	Photos 116-118
35	Harris	Matlock	N	N	Y	Y	N	N	Y	N	N	Y	N	N	N	N	N	Photos 119-122
36	Harris	Silo	N	Y	N	Y	N	N	N	N	N	N	N	N	N	N	N	Photos 123-125
37	Matlock	Turner Warnell	N	N	Y	Y	N	N	Y	N	N	Y	N	N	N	N	N	Photos 126-128
38	Cooper	Turner Warnell	Y	N	Y	Y	N	Y, 2	Y	N	N	Y	N	N	N	N	N	Photos 129-132
39	Calendar	Turner Warnell	Y	Y	N	Y	N	Y	N	N	N	N	N	N	N	N	N	Photos 133-134
40	Calendar	Curry	Y	Y	N	Y	_	Y	N	N	N	N	N	N	N	N	N	Photos 135

APPENDIX G: INTERSECTION RECOMMENDATION TABLES

Intersection Improvement Project #	Road 1	Road 2	Needs Sidewalk (Y/N)	Stripe New Crosswalk Markings (Y/N)	Restripe Existing Crosswalk Markings (Y/N)	Advanced Stop Lines (Y/N)	Reconstruct Existing Curb Ramps (Y/N)	Construct New Curb Ramps (Y/N)	Median Refuge Islands (Y/N)	Curb Extensions (Y/N)	Reduce Turning Radius (Y/N)	Pedestrian Countdown Signal Heads (Y/N)	Restrict Right turn on Red	High - Visibility Pedestrian Warning Signs	In-Roadway Pedestrian Crossing Signs	Remove Sight-Distance Obstruction	Pedestrian Underpass/ Overpass	Details and Extra Notes
41	Calendar	Sublett	N	N	Y	Y	N	N	N	N	N	N	N	N	N	N	N	Photos 136-139
42	Green Oaks	Sublett	Y	N	Y	Y	Y	N	Y	N	N	Y	N	N	N	N	N	Photos 140-142
43	Bardin	Bowen	N	N	Y	Y	N	N	N	N	N	Y	N	N	N	N	N	Photos 143-147
44	Arbrook	Bowen	N	N	Y	Y	Y	N	N	N	N	Y	N	N	N	N	N	Photos 148-150
45	California	Bowen	Y	N	Y	Y	N	N	N	N	N	Y	N	N	N	N	N	Photos 151-153
46	Arkansas	Bowen	N	N	Y	Y	N	N	N	N	N	Y	N	N	N	N	N	Photos 154-156
47	Sherry	Arbrook	N	Y	N	Y	N	N	N	N	N	N	N	N	N	N	N	Photos 157-160
48	New York	Tech Center	Y	Y	N	Y	N	Y	N	N	N	N	N	N	N	N	N	Photos 161-163
49	New York	Bardin	N	N	Y	Y	N	N	N	N	N	Y	N	N	N	N	N	Photos 164-167
50	New York	High Bank	N	N	Y	Y	N	N	N	N	N	Y	N	N	N	N	N	Photos 168-170
51	New York	Green Oaks	N	N	Y	Y	N	N	Y	N	N	Y	N	N	N	N	N	Photos 171-173
52	Sublett	Prescott	N	Y	Y	Y	Y	N	Y	N	N	Y	N	N	N	N	N	Photos 174-176
53	New York	Southeast Parkway	N	N	Y	Y	N	N	N	N	N	Y	N	N	N	N	N	Photos 177-179
54	New York	Mansfield Webb	Y	N	Y	Y	Y	Y	N	N	N	Y	N	N	N	N	N	Photos 180-182
55	Silo	Mansfield Webb	Y	Y	_	Y	_	Y	N	N	N	N	N	N	N	N	N	Photos 183-184
56	Mansfield Webb	Matlock	Y	Y	Y	Y	N	N	Y	N	N	Y	N	N	N	N	N	Photos 185-187
57	Mansfield Webb	Ballweg	Y	Y	_	Y	_	Y	N	N	N	N	N	N	N	N	N	Photos 188-189
58	Matlock	Eden	N	N	Y	Y	N	N	Y	N	N	Y	N	N	N	N	N	Photos 190-192
59	Sublett	Silo	Y	N	Y	Y	N	N	Y	N	N	Y	N	N	N	N	N	Photos 193-195
60	Southeast Parkway	Collins	Y	Y	_	Y	N	N	N	N	N	N	N	N	N	N	N	Photos 196-198

APPENDIX G: INTERSECTION RECOMMENDATION TABLES

Intersection Improvement Project #	Road 1	Road 2	Needs Sidewalk (Y/N)	Stripe New Crosswalk Markings (Y/N)	Restripe Existing Crosswalk Markings (Y/N)	Advanced Stop Lines (Y/N)	Reconstruct Existing Curb Ramps (Y/N)	Construct New Curb Ramps (Y/N)	Median Refuge Islands (Y/N)	Curb Extensions (Y/N)	Reduce Turning Radius (Y/N)	Pedestrian Countdown Signal Heads (Y/N)	Restrict Right turn on Red	High - Visibility Pedestrian Warning Signs	In-Roadway Pedestrian Crossing Signs	Remove Sight-Distance Obstruction	Pedestrian Underpass/ Overpass	Details and Extra Notes
61	Sublett	Collins	N	N	Y	Y	N	N	Y	N	N	Y	N	N	N	N	N	Existing Median Refuge for North - South Photos 199-200
62	Green Oaks	Collins	N	N	Y	Y	N	N	Y	N	N	Y	N	N	N	N	N	Existing Median Refuge for North - South Photos 201-204
63	Collins	Bardin	Y	N	Y	Y	N	Y	Y	N	N	Y	N	N	N	N	N	Photos 205-207
64	Matlock	Bardin	N	N	Y	Y	N	N	Y	N	N	Y	N	N	N	N	N	Photos 208-211
65	Yaupon	Green Oaks	N	N	Y	Y	N	N	Y	N	N	Y	N	N	N	N	N	Photos 212-214
66	Yaupon	Cravens Park	N	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	Photos 215-217
67	Cooper	Harris	Y	N	Y	Y	Y	Y	Y	N	N	Y	N	N	N	N	N	Photos 218-220
68	Cooper	Eden	Y	N	Y	Y	Y	Y	N	Y	N	Y	N	N	N	N	N	Photos 221-223
69	Cooper	Sublett	N	N	Y	Y	N	N	Y	N	N	Y	N	N	N	N	N	Photos 224-226
70	Sublett	Tennessee	N	Y	_	Y	Y	Y	Y	N	N	N	N	N	N	N	N	Photos 227-230
71	Cooper	Nathan Lowe	Y	N	Y	Y	Y	N	N	N	N	Y	N	N	N	N	N	Photos 231-233
72	Caliente	Green Oaks	Y	Y	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	Photos 234-236
73	Bardin	Caliente	Y	Y	N	Y	Y	N	N	N	N	N	N	N	N	N	N	Photos 237-239
74	Park Springs	Indian Wells	Y	Y	_	Y	Y	N	N	N	N	Y	N	N	N	N	N	Photos 240-243
75	Park Springs	Frontage	Y	N	Y	Y	N	Y	N	N	N	Y	N	N	N	N	N	Photos 244-246
76	Kelly Elliott	Lorraine	N	Y	N	Y	Y	N	N	N	N	N	N	N	N	N	N	Photos 247-249
77	Kelly Elliott	Green Acres	N	Y	N	Y	Y	N	N	N	N	Y	N	Y	N	N	N	Photos 250-251
78	Kelly Elliott	Green Oaks	N	N	Y	Y	Y	Y	Y	N	N	Y	N	Y	N	N	N	Provide Larger Median Refuge Area with New Curb Ramps, Photos 252-258
79	Kelly Elliott	Sublett	N	N	Y	Y	N	N	N	N	N	Y	N	Y	N	N	N	Photos 259-261
80	Kelly Elliott	Gentle Springs	N	N	Y	Y	Y	N	N	N	N	N	N	Y	N	N	N	Photos 262-263

APPENDIX G: INTERSECTION RECOMMENDATION TABLES

Intersection Improvement Project #	Road 1	Road 2	Needs Sidewalk (Y/N)	Stripe New Crosswalk Markings (Y/N)	Restripe Existing Crosswalk Markings (Y/N)	Advanced Stop Lines (Y/N)	Reconstruct Existing Curb Ramps (Y/N)	Construct New Curb Ramps (Y/N)	Median Refuge Islands (Y/N)	Curb Extensions (Y/N)	Reduce Turning Radius (Y/N)	Pedestrian Countdown Signal Heads (Y/N)	Restrict Right turn on Red	High - Visibility Pedestrian Warning Signs	In-Roadway Pedestrian Crossing Signs	Remove Sight-Distance Obstruction	Pedestrian Underpass/ Overpass	Details and Extra Notes
81	287	Kenedale	Y	Y	N	Y	N	Y	N	N	N	Y	N	Y	N	N	Y	Photos 264-266
82	Eden	MLK Park	Y	Y	Y	Y	N	N	Y	N	N	N	N	N	N	N	N	Photos 267-270
83	Bowman Springs	Royal Gate Drive	Y	Y	N	Y	Y	Y	N	N	N	N	N	N	N	N	N	Photos 271-274
84	Royal Gate	Shorewood	N	Y	N	Y	Y	Y	N	N	N	N	N	N	N	N	N	Photos 275-278
85	Poly Webb	Shorewood	Y	Y	Y	Y	Y	Y	Y	N	N	Y	N	N	N	N	N	Photos 279-281
86	Bowman Springs	Poly Web	Y	Y	Y	Y	N	Y	N	N	Y	Y	N	Y	N	N	N	Photos 282-284
87	Poly Webb	Pleasant Ridge	N	Y	Y	Y	Y	N	Y	N	N	Y	N	Y	N	N	N	Photos 285-288
88	Perkins	Pleasant Ridge	N	N	Y	Y	Y	N	N	N	N	Y	N	Y	N	N	N	Photos 289-291
89	Perkins	Shorewood	N	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	Photos 292-295
90	Waterview	Perkins	Y	Y	Y	Y	Y	Y	Y	N	N	Y	N	Y	N	N	N	Photos 296-299
91	Perkins	Arkansas	N	Y	N	Y	Y	N	N	N	N	N	N	N	N	N	N	Photos 300-303
92	Arkansas	Green Oaks	N	N	N	N	Y	N	Y	N	N	Y	N	N	N	N	N	Photos 304-307
93	Waterview	Green Oaks	N	Y	Y	Y	N	N	N	N	N	Y	N	N	N	N	N	Photos 308-310
94	Pleasant Ridge	Green Oaks	N	N	N	N	N	N	N	N	N	Y	N	Y	N	N	N	Photos 311-313
95	Woodside	Pleasant Ridge	N	N	Y	N	Y	Y	N	N	N	Y	N	Y	N	N	N	Photos 314-315
96	Woodside	Mayfield	Y	N	Y	N	Y	Y	N	N	N	N	N	N	N	Y	N	Photos 316-319
97	Woodside	Rushmore	N	Y	N	Y	N	N	N	N	N	N	N	N	N	N	N	Photos 320-322
98	Arkansas	Woodside	N	N	Y	Y	Y	N	N	N	N	Y	N	N	N	N	N	Photos 323-325
99	Arkansas	Spanish Trail	Y	N	Y	N	Y	Y	N	N	N	Y	N	N	N	N	N	Photos 326-329
100	Green Oaks	303	Y	N	Y	N	N	N	N	N	N	Y	N	Y	N	N	N	Photos 330-334

APPENDIX G: INTERSECTION RECOMMENDATION TABLES

Intersection Improvement Project #	Road 1	Road 2	Needs Sidewalk (Y/N)	Stripe New Crosswalk Markings (Y/N)	Restripe Existing Crosswalk Markings (Y/N)	Advanced Stop Lines (Y/N)	Reconstruct Existing Curb Ramps (Y/N)	Construct New Curb Ramps (Y/N)	Median Refuge Islands (Y/N)	Curb Extensions (Y/N)	Reduce Turning Radius (Y/N)	Pedestrian Countdown Signal Heads (Y/N)	Restrict Right turn on Red	High - Visibility Pedestrian Warning Signs	In-Roadway Pedestrian Crossing Signs	Remove Sight-Distance Obstruction	Pedestrian Underpass/ Overpass	Details and Extra Notes
101	Bowen	Park Row	Y	N	Y	N	N	N	N	N	N	Y	N	Y	N	N	N	Photos 335-337
102	Bowen	Norwood	N	N	N	N	Y	Y	N	N	N	Y	N	Y	N	N	N	Photos 338-340
103	Fielder	Norwood	Y	Y	Y	N	N	Y	N	N	N	Y	N	N	N	N	N	Photos 341-343
104	Fielder	Park Row	N	Y	Y	Y	Y	N	N	N	N	Y	N	Y	N	N	N	Photos 344-347
105	Fielder	Tucker	Y	N	Y	Y	N	N	N	N	N	Y	N	N	N	N	N	Photos 348-350
106	Tucker	Davis	Y	Y	Y	N	N	Y	N	N	N	N	N	Y	N	N	N	Photos 351-356
107	Park Row	Davis	Y	Y	Y	N	Y	N	N	N	N	Y	N	N	N	N	N	Photos 357-359
108	Mitchell	Davis	Y	N	N	N	N	Y	N	N	N	Y	N	N	N	N	N	Photos 360-362
109	Second	Davis	Y	Y	N	N	Y	Y	N	N	N	Y	N	N	N	N	N	Photos 363-365
110	Abram	Davis	Y	N	Y	N	Y	Y	N	N	N	Y	N	Y	N	N	N	Photos 366
111	Division	Davis	Y	N	N	N	Y	N	N	N	N	Y	N	N	N	N	N	Photos 367-370
112	Sanford	Davis	Y	N	Y	N	Y	Y	N	N	N	Y	N	N	N	N	N	Photos 371-373
113	Randol Mill	Davis	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	Photos 374-375
114	Road to Six Flags	Davis	Y	N	Y	Y	Y	N	Y	N	N	Y	N	N	N	N	N	Photos 376-378
115	Fielder	Randol Mill	N	N	Y	N	N	N	N	N	N	Y	N	Y	N	N	N	Photos 379-383
116	Randoll Mill Park	Y	Y	Y	Y	N	Y	Y	N	N	N	Y	N	N	N	N	N	Photos 384-386
117	West Wood	Bowen	Y	Y	N	N	Y	Y	N	N	N	Y	N	N	N	N	N	Photos 387-388
118	Division	Bowen	Y	N	N	N	Y	Y	N	N	N	Y	N	Y	N	N	N	Photos 389-392
119	Oakwood	Sanford	Y	Y	N	N	N	Y	N	N	N	N	N	N	N	N	N	Photos 393-395
120	Fielder	Sanford	Y	N	Y	Y	Y	Y	N	N	N	Y	N	N	N	N	N	Photos 396-398

APPENDIX G: INTERSECTION RECOMMENDATION TABLES

Intersection Improvement Project #	Road 1	Road 2	Needs Sidewalk (Y/N)	Stripe New Crosswalk Markings (Y/N)	Restripe Existing Crosswalk Markings (Y/N)	Advanced Stop Lines (Y/N)	Reconstruct Existing Curb Ramps (Y/N)	Construct New Curb Ramps (Y/N)	Median Refuge Islands (Y/N)	Curb Extensions (Y/N)	Reduce Turning Radius (Y/N)	Pedestrian Countdown Signal Heads (Y/N)	Restrict Right turn on Red	High - Visibility Pedestrian Warning Signs	In-Roadway Pedestrian Crossing Signs	Remove Sight-Distance Obstruction	Pedestrian Underpass/ Overpass	Details and Extra Notes
121	Lamar	Davis	Y	Y	N	Y	Y	N	Y	N	N	Y	N	Y	N	N	N	Photos 399-402
122	Bert	Davis	N	Y	N	Y	Y	Y	Y	N	N	N	N	Y	N	N	N	Photos 403-405
123	Green Oaks	Davis	N	N	N	N	Y	Y	Y	N	N	Y	N	Y	N	N	N	Photos 406-408
124	Fielder	Green Oaks	N	Y	N	N	Y	Y	Y	N	N	Y	N	Y	N	N	N	Photos 409-411
125	Fielder	Lamar	N	Y	Y	N	Y	Y	Y	N	N	Y	N	Y	N	N	N	Photos 412-415
126	Cooper	Lamar	N	N	Y	N	Y	N	Y	N	N	Y	N	Y	N	N	N	Photos 416-419
127	Cooper	Washington	N	N	Y	Y	Y	N	N	N	N	Y	N	N	N	N	N	Photos 420-422
128	Cooper	Green Oaks	N	Y	Y	Y	Y	N	Y	N	N	Y	N	Y	N	N	N	Photos 423-426
129	Lincoln	Green Oaks	Y	N	Y	N	Y	Y	Y	N	N	Y	N	N	N	N	N	Photos 427-429
130	Lincoln	Brown	N	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	N	Photos 430-431
131	Lincoln	Washington	Y	Y	N	Y	N	Y	N	N	N	N	N	N	N	N	N	Photos 432-433
132	Lincoln	Lamar	Y	N	Y	N	Y	Y	Y	N	N	Y	N	Y	N	N	N	Photos 434-436
133	Collins	Lamar	N	N	Y	N	N	N	N	N	N	Y	N	Y	N	N	N	Photos 437-440
134	Collins	Brown	Y	Y	N	Y	Y	Y	N	N	N	Y	N	Y	N	N	N	Photos 441-445
135	Collins	Green Oaks	Y	Y	Y	N	Y	N	Y	N	N	Y	N	Y	N	N	N	Photos 446-448
136	Green Oaks	Winding Hollow	N	Y	Y	Y	Y	Y	Y	N	N	N	N	Y	N	N	N	Photos 449-452
137	Green Oaks	Ball Park Way	Y	Y	Y	Y	N	Y	Y	N	N	Y	N	Y	N	N	N	Photos 453-456
138	Brown	Ball Park Way	Y	N	Y	Y	Y	N	N	N	N	Y	N	N	N	N	N	Photos 457-459
139	Ball Park Way	Lamar	N	N	Y	Y	Y	N	N	N	N	Y	N	Y	N	N	N	Photos 460-465
140	Cooper	Randol Mill	N	N	N	N	N	N	N	N	N	Y	N	Y	N	N	N	Photos 466-469

APPENDIX G: INTERSECTION RECOMMENDATION TABLES

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141	Cooper	I-30 South Side	N	N	Y	Y	Y	N	N	N	N	Y	N	N	N	N	N	Photos 470-475
142	Cooper	Sanford	N	Y	Y	Y	Y	N	N	N	N	Y	N	Y	N	N	N	Photos 476-480
143	Cooper	Division	N	N	Y	Y	Y	N	N	N	N	Y	N	Y	N	N	N	Photos 481-485
144	Cooper	Abram	N	N	Y	N	Y	N	N	N	N	Y	N	Y	N	N	N	Photos 486-489
145	Cooper	Park Row	Y	N	Y	N	Y	Y	N	N	N	Y	N	Y	N	N	N	Photos 490-496
146	Cooper	Inwood	N	N	N	N	N	N	N	N	N	Y	N	Y	N	N	N	Photos 497-500
147	Center	Tucker	N	Y	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Photos 501-504
148	Center	Park Row	N	Y	Y	Y	Y	N	N	N	N	Y	N	Y	N	N	N	Photos 505-510
149	Mesquite	Mitchell	Y	N	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	Photos 511-515
150	Mesquite	Border	N	N	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	Photos 516-518
151	Mesquite	Abram	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	Photos 519-522
152	Mesquite	Division	Y	Y	Y	Y	Y	Y	N	N	N	Y	N	N	N	N	N	Photos 523-525
153	Mesquite	Sanford	N	N	N	N	Y	Y	N	N	N	N	N	N	N	N	N	Photos 526-528
154	Center	Road to Six Flags	N	N	Y	Y	Y	N	N	N	N	Y	N	Y	N	N	N	Photos 529-533
155	Center	Randol Mill	N	N	N	N	N	N	N	N	N	Y	N	Y	N	N	N	Photos 534-538
156	Center	Sanford	N	N	Y	Y	Y	Y	N	N	N	Y	N	N	N	N	N	Photos 539-542
157	Center	Division	N	Y	Y	N	Y	Y	N	N	N	Y	N	Y	N	N	N	Photos 543-546
158	Center	1st	N	N	N	N	N	N	N	N	N	Y	N	Y	N	N	N	Photos 547-550
159	Center	Barden	N	Y	Y	Y	N	N	N	N	N	Y	N	Y	N	N		Photos 551-555
160	Collins	Pioneer	Y	N	Y	N	Y	N	N	N	N	Y	N	Y	N	N	N	Photos 556-562

APPENDIX G: INTERSECTION RECOMMENDATION TABLES

Intersection Improvement Project #	Road 1	Road 2	Needs Sidewalk (Y/N)	Stripe New Crosswalk Markings (Y/N)	Restripe Existing Crosswalk Markings (Y/N)	Advanced Stop Lines (Y/N)	Reconstruct Existing Curb Ramps (Y/N)	Construct New Curb Ramps (Y/N)	Median Refuge Islands (Y/N)	Curb Extensions (Y/N)	Reduce Turning Radius (Y/N)	Pedestrian Countdown Signal Heads (Y/N)	Restrict Right turn on Red	High - Visibility Pedestrian Warning Signs	In-Roadway Pedestrian Crossing Signs	Remove Sight-Distance Obstruction	Pedestrian Underpass/ Overpass	Details and Extra Notes
161	Collins	Lovers Lane	N	N	Y	N	Y	Y	N	N	N	Y	N	Y	N	N	N	Photos 563-565
162	Collins	Park Row	N	N	Y	Y	Y	N	N	N	N	Y	N	Y	N	N	N	Photos 566-569
163	Collins	Mitchell	N	N	Y	Y	Y	N	N	N	N	Y	N	Y	N	N	N	Photos 570-574
164	Collins	Abram	N	N	Y	Y	Y	N	N	N	N	Y	N	Y	N	N	N	Photos 575-580
165	Collins	Sanford	Y	Y	N	Y	Y	N	N	N	N	Y	N	N	N	N		Photos 581-583
166	Randol Mill	Collins	N	N	Y	Y	N	N	N	N	N	Y	N	Y	N	N	N	Photos 584-586
167	Collins	Road to Six Flags	Y	N	Y	Y	Y	N	N	N	N	Y	N	Y	N	N	N	Photos 587-589
168	Stadium	Randol Mill	N	N	N	N	N	N	N	N	N	Y	N	Y	N	N	N	Photos 590-593
169	Stadium	Abram	N	Y	Y	Y	Y	N	Y	N	N	Y	N	Y	N	N	N	Photos 594-597
170	Browning Stadium	Park Row	N	N	Y	Y	Y	N	N	N	N	Y	N	Y	N	N	N	Photos 598-600
171	Browning	Lovers	N	N	Y	Y	Y	Y	N	N	N	N	N	Y	N	N	N	Photos 601-603
172	Browning	303	Y	N	Y	N	Y	N	N	N	N	Y	N	N	N	N	N	Photos 604-610
173	303	New York	N	N	Y	N	Y	N	N	N	N	Y	N	N	N	N	N	Photos 611-615
174	New York	Lovers	N	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	N	Photos 616-619
175	New York	Park Row	N	N	Y	Y	Y	N	N	N	N	Y	N	N	N	N	N	Photos 620-623
176	New York	Mitchell	N	N	Y	Y	Y	N	N	N	N	Y	N	N	N	N	N	Photos 624-627
177	Abram	Sherry	Y	Y	Y	Y	Y	Y	Y	N	N	Y	N	Y	N	N	N	Photos 628-630
178	Sherry	Mitchell	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	Photos 631-634
179	Sherry	Park Row	Y	N	Y	Y	Y	Y	N	N	N	Y	N	N	N	N	N	Photos 635-638
180	Sherry	Craig Hanking	N	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	N	Photos 639-640

APPENDIX G: INTERSECTION RECOMMENDATION TABLES

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181	303	Forum	Y	Y	N	Y	Y	Y	Y	N	N	N	N	Y	N	N	N	Photos 641-644
182	Susan	Park Row	Y	N	Y	Y	Y	N	N	N	N	Y	N	Y	N	N	N	Photos 645-650
183	Susan	San Frando	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	Photos 651-653
184	360	Mitchell	Y	Y	Y	Y	Y	Y	N	N	N	N	N	Y	N	N	Y	Photos 654-657
185	Division	109	Y	Y	Y	Y	N	Y	Y	N	N	Y	N	Y	N	N	N	Photos 658-661
186	Randol Mill	109	Y	Y	Y	N	Y	Y	N	N	N	Y	N	Y	N	N	N	Photos 662-667
187	Randol Mill	360	Y	N	Y	Y	N	Y	N	N	N	Y	N	Y	N	N	Y	Photos 668-675
188	California	Cooper	Y	N	Y	N	Y	Y	N	N	N	Y	N	Y	N	N	N	Photos 676-680
189	Handisty	Parkside Lane	N	Y	N	Y	Y	N	N	N	N	N	N	N	N	N	N	Photos 681-684
190	Lynn Creek	Matlock	N	N	Y	Y	N	N	N	N	N	Y	N	Y	N	N	N	Photos 685-690

G. TILED RECOMMENDATION MAPS

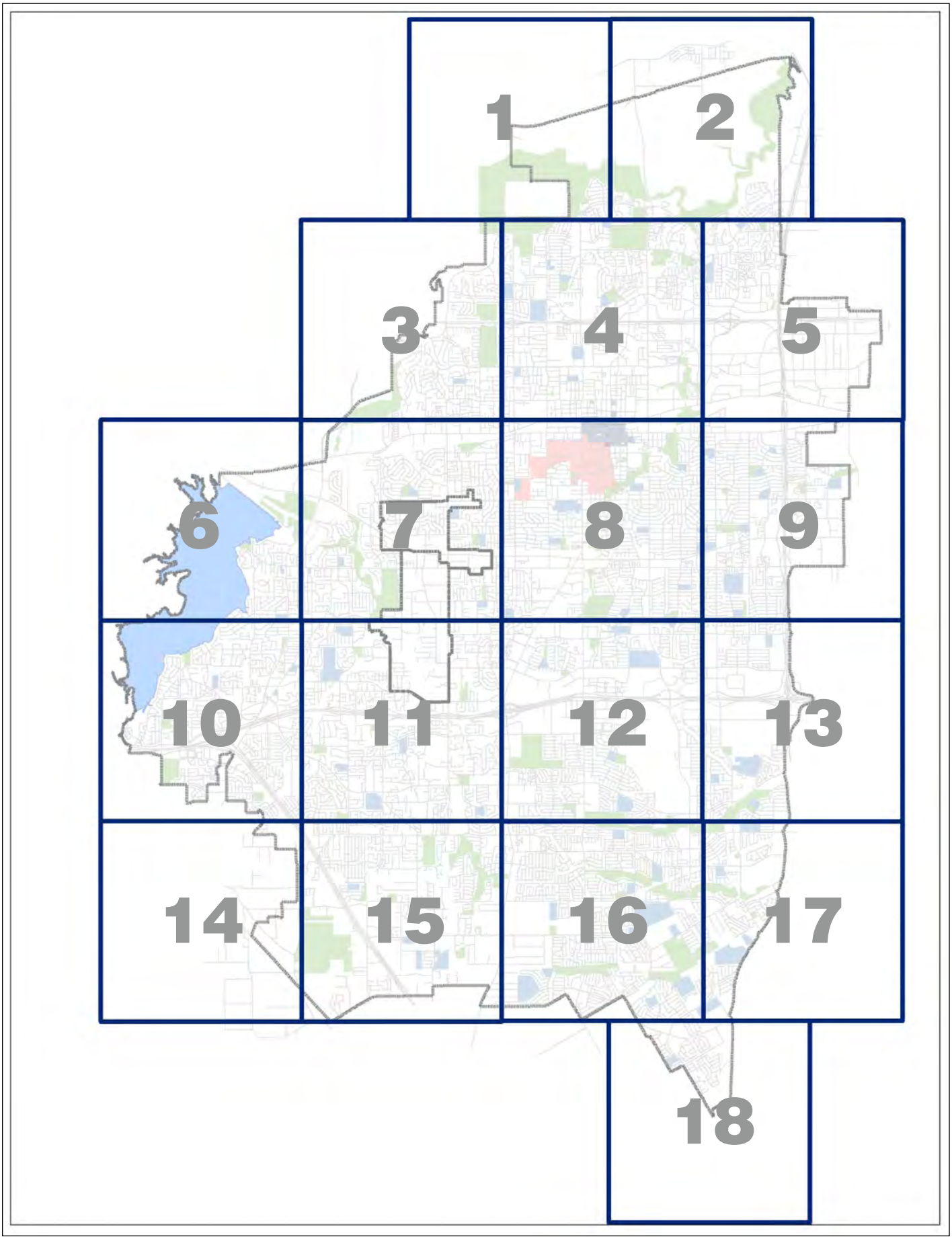
Appendix Contents
Overview
Bike Grid Maps
Hike Grid Maps

Overview

The following pages contain the recommended hike and bike system network grid maps. The city network maps were divided into 18 3x3 mile grids for purposes of legibility and easier interpretation. The first set of grids contains the bike recommendations, specifically the on-road bike facilities (broken into specific facility type and likely method of construction), greenway, and Veloweb recommendations. The second set of grids contains the hike recommendations, specifically the sidewalk, crossing improvement, greenway, and Veloweb recommendations. An overlap of approximately 1/8 of a mile is provided between each grid.

As described previously, the hike and bike system recommendations set a framework for development over the long-term. Hike and bike facilities will be developed segment-by-segment through a variety of mechanisms: future roadway reconstruction projects, roadway reconfiguration projects (such as road diets and restripes), standalone projects, commercial/residential development projects, and right-of-way acquisition/development. These maps will need to be updated within five years.

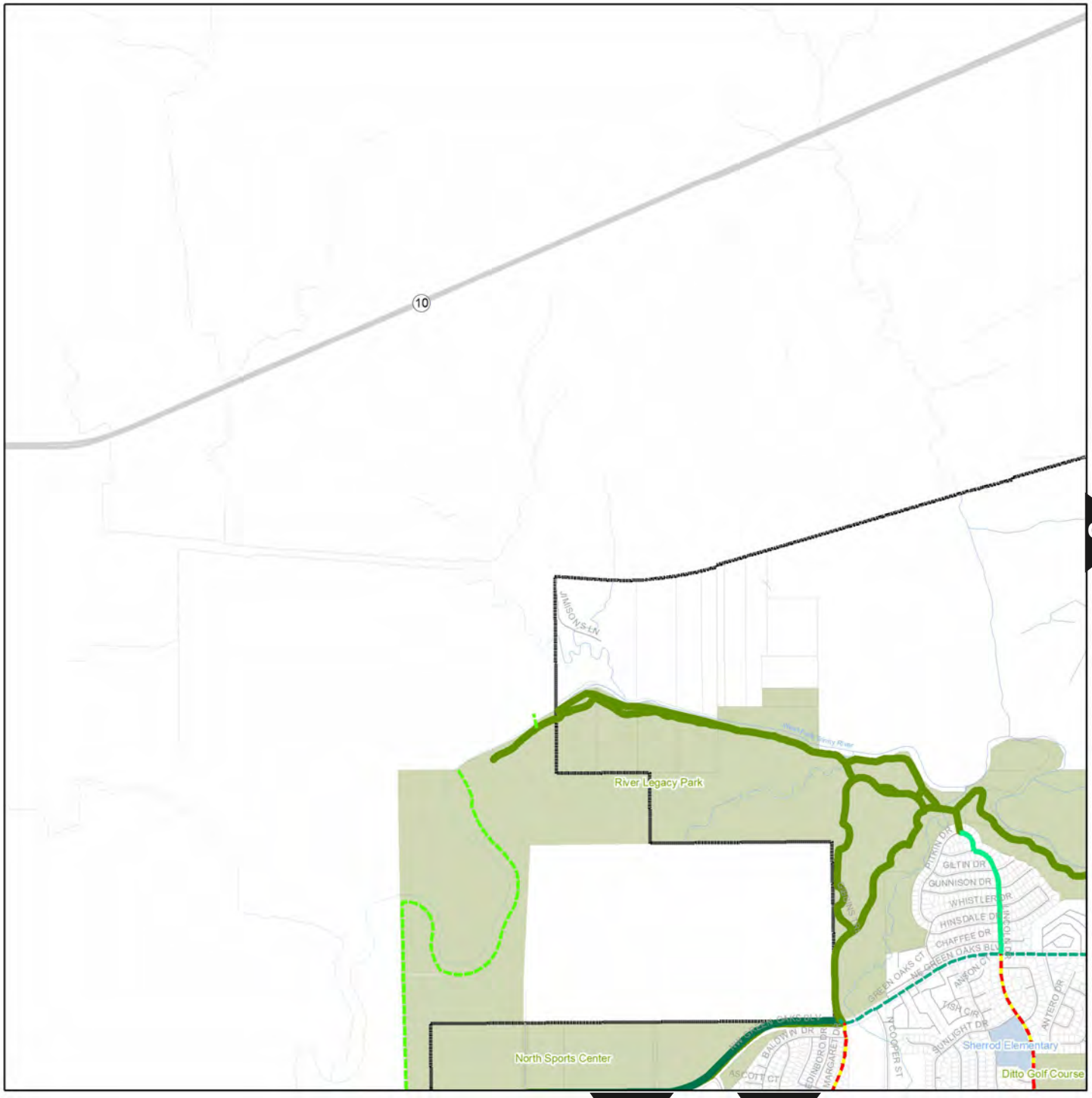
Hike & Bike Grid Overview Map



Bike Tile 1

Legend

Bike Recommendations
- Existing Bike Lane
- Existing Paved Shoulder
- Bike Lane, New Construction
- Bike Lane, Road Diet
- Bike Lane, Stripe
- Paved Shoulder, New Construction
- Wide Outside Lane, Restripe
- Bike Route
- Recommended Trails
- Recommended Sidepaths
- Existing Trails
- Existing Sidepaths
- Railroad
- Highways
- Streets
- Streams
- Shopping Centers
- Downtown Business District
- UT-Arlington
- Tarrant County College - SE Campus
- Schools
- Parks
- Lake
- Parcels
- Arlington Municipal Boundary
- County Boundary



0 0.25 0.5 1 Miles

Bike Tile 2

Legend

Bike Recommendations
- Existing Bike Lane
- Existing Paved Shoulder
- Bike Lane, New Construction
- Bike Lane, Road Diet
- Bike Lane, Stripe
- Paved Shoulder, New Construction
- Wide Outside Lane, Restripe
- Bike Route
- Recommended Trails
- Recommended Sidepaths
- Existing Trails
- Existing Sidepaths
- Railroad
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- Streets
- Streams
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Bike Tile 3

Legend

Bike Recommendations
- Existing Bike Lane
- Existing Paved Shoulder
- Bike Lane, New Construction
- Bike Lane, Road Diet
- Bike Lane, Stripe
- Paved Shoulder, New Construction
- Wide Outside Lane, Restripe
- Bike Route
- Recommended Trails
- Recommended Sidepaths
- Existing Trails
- Existing Sidepaths
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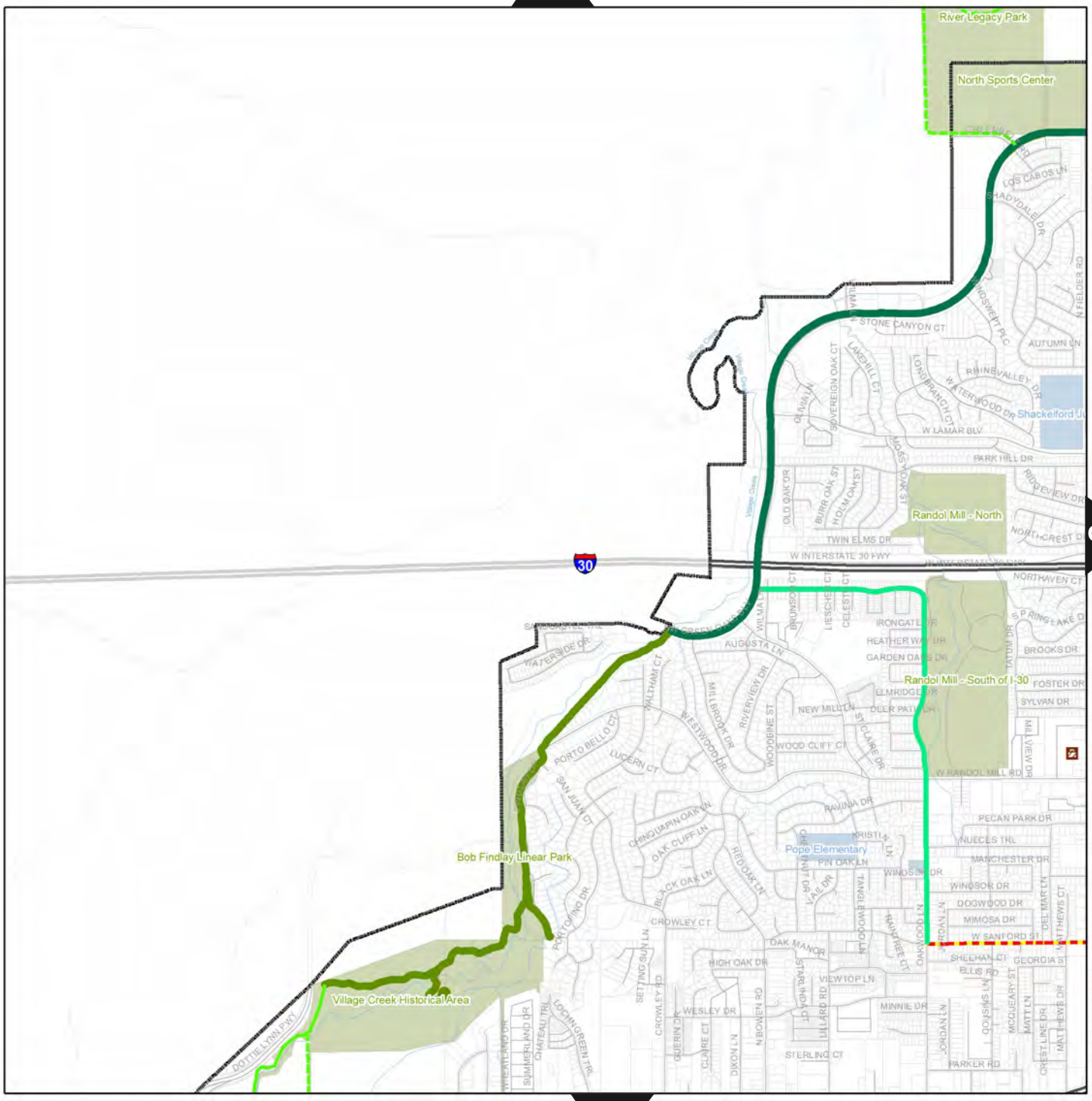
G-3



G-6

G-9

0 0.25 0.5 1 Miles

Bike Tile 4

Legend

Bike Recommendations
- Existing Bike Lane
- Existing Paved Shoulder
- Bike Lane, New Construction
- Bike Lane, Road Diet
- Bike Lane, Stripe
- Paved Shoulder, New Construction
- Wide Outside Lane, Restripe
- Bike Route
- Recommended Trails
- Recommended Sidepaths
- Existing Trails
- Existing Sidepaths
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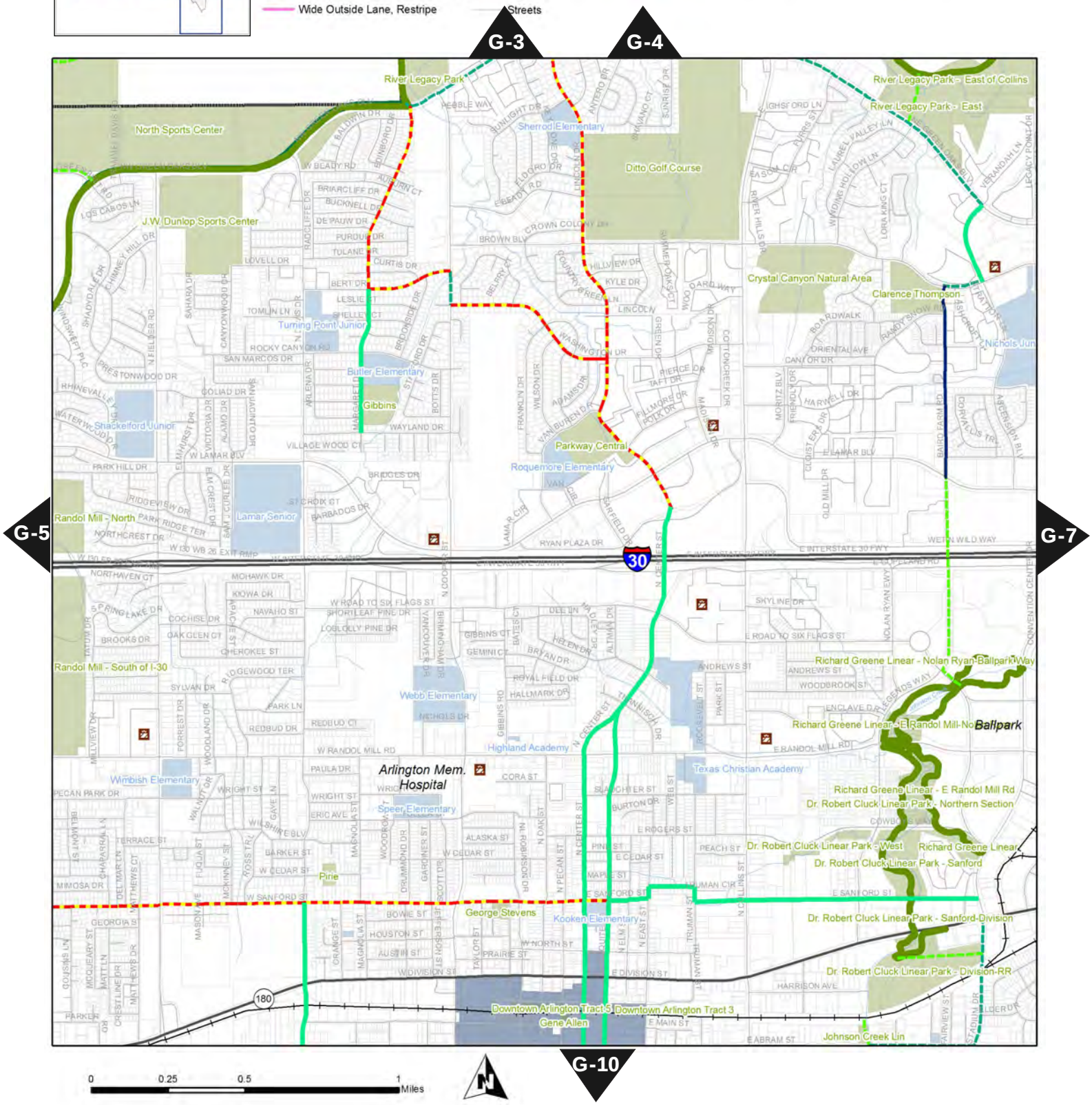

Bike Tile 5

Legend

Bike Recommendations
- Existing Bike Lane
- Existing Paved Shoulder
- Bike Lane, New Construction
- Bike Lane, Road Diet
- Bike Lane, Stripe
- Paved Shoulder, New Construction
- Wide Outside Lane, Restripe
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Bike Tile 6

Legend

Bike Recommendations
- Existing Bike Lane
- Existing Paved Shoulder
- Bike Lane, New Construction
- Bike Lane, Road Diet
- Bike Lane, Stripe
- Paved Shoulder, New Construction
- Wide Outside Lane, Restripe
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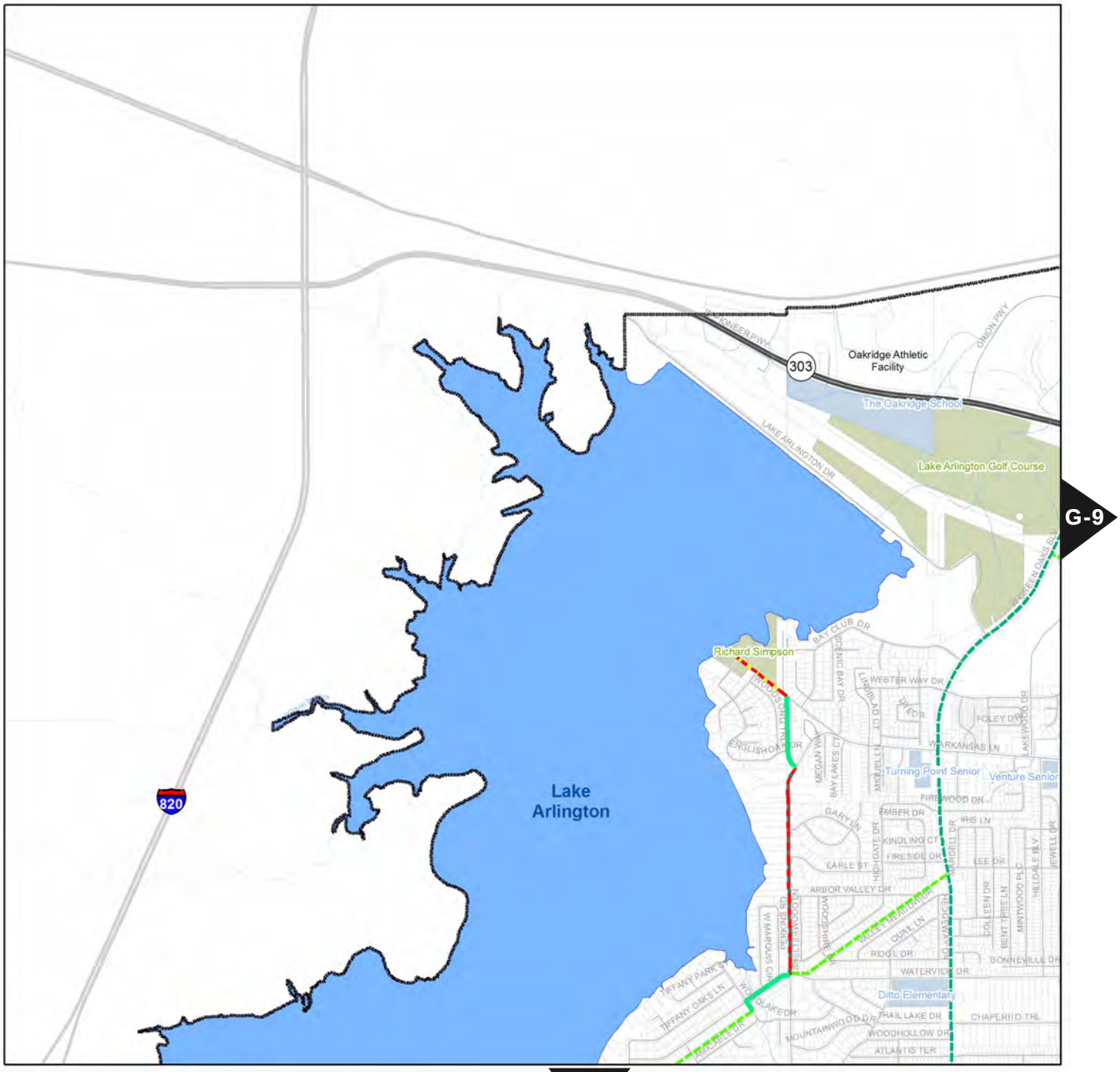

Bike Tile 7

Legend

Bike Recommendations
- Existing Bike Lane
- Existing Paved Shoulder
- Bike Lane, New Construction
- Bike Lane, Road Diet
- Bike Lane, Stripe
- Paved Shoulder, New Construction
- Wide Outside Lane, Restripe
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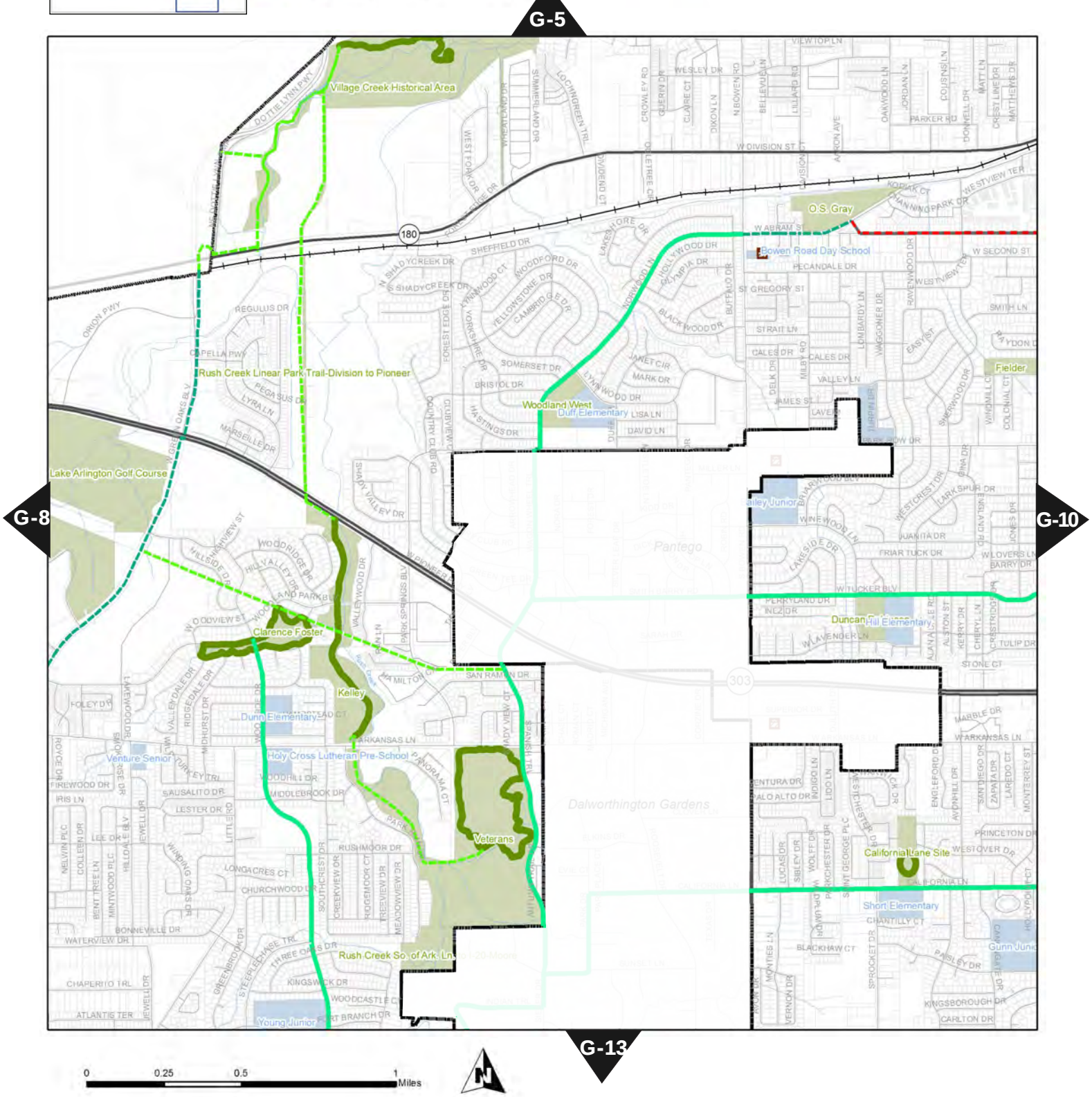
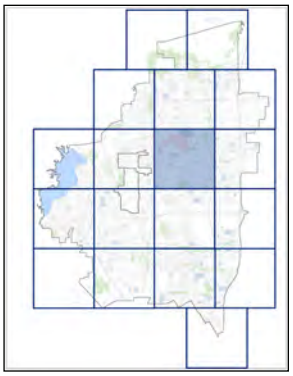


Bike Tile 8



Legend

Bike Recommendations
- Existing Bike Lane
- Existing Paved Shoulder
- Bike Lane, New Construction
- Bike Lane, Road Diet
- Bike Lane, Stripe
- Paved Shoulder, New Construction
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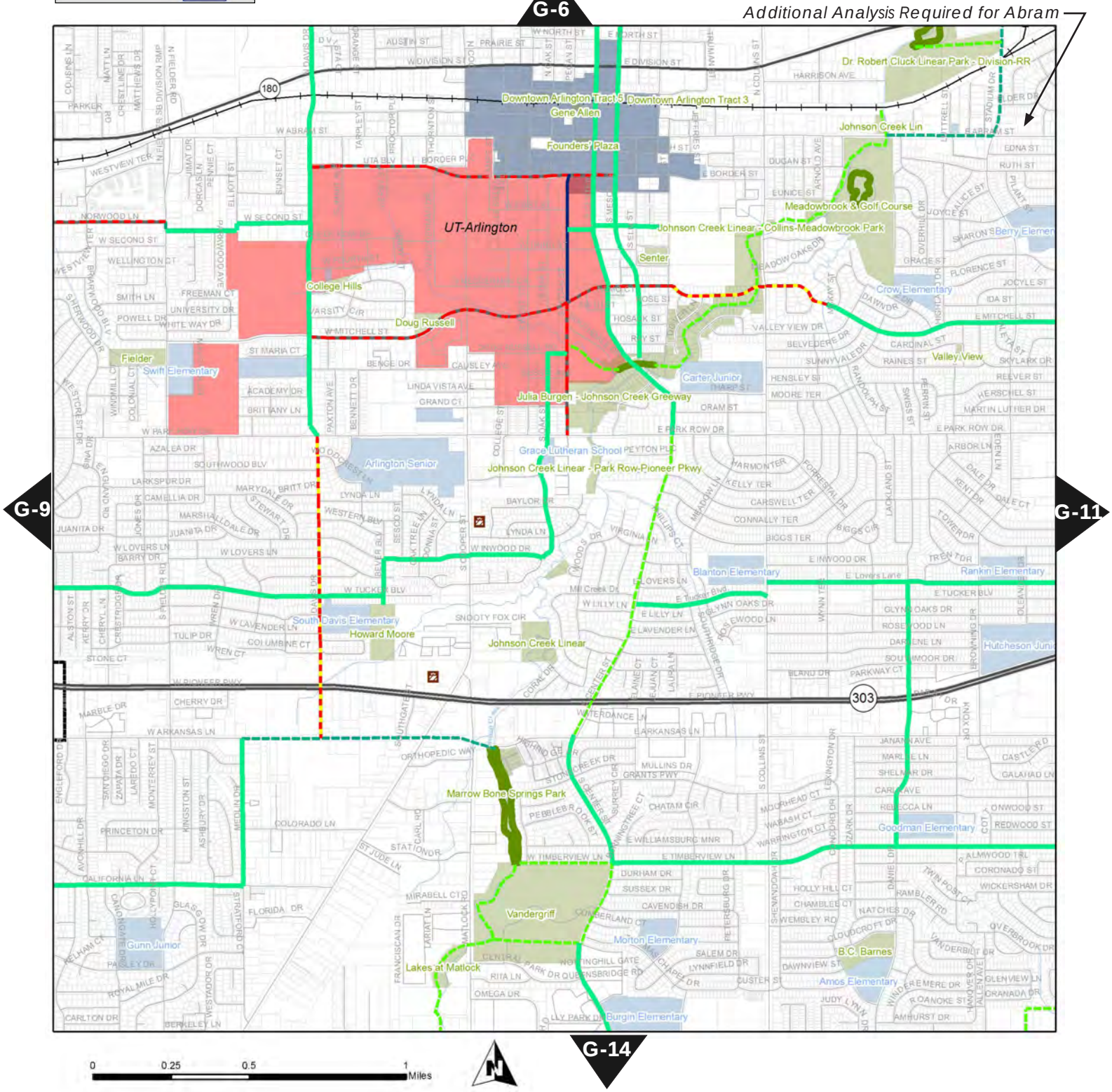
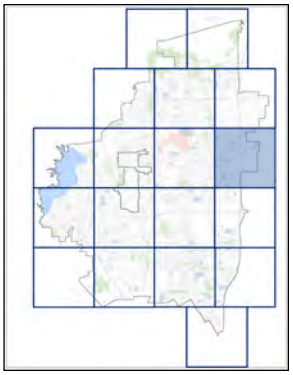


Bike Tile 9



Legend

Bike Recommendations
- Existing Bike Lane
- Existing Paved Shoulder
- Bike Lane, New Construction
- Bike Lane, Road Diet
- Bike Lane, Stripe
- Paved Shoulder, New Construction
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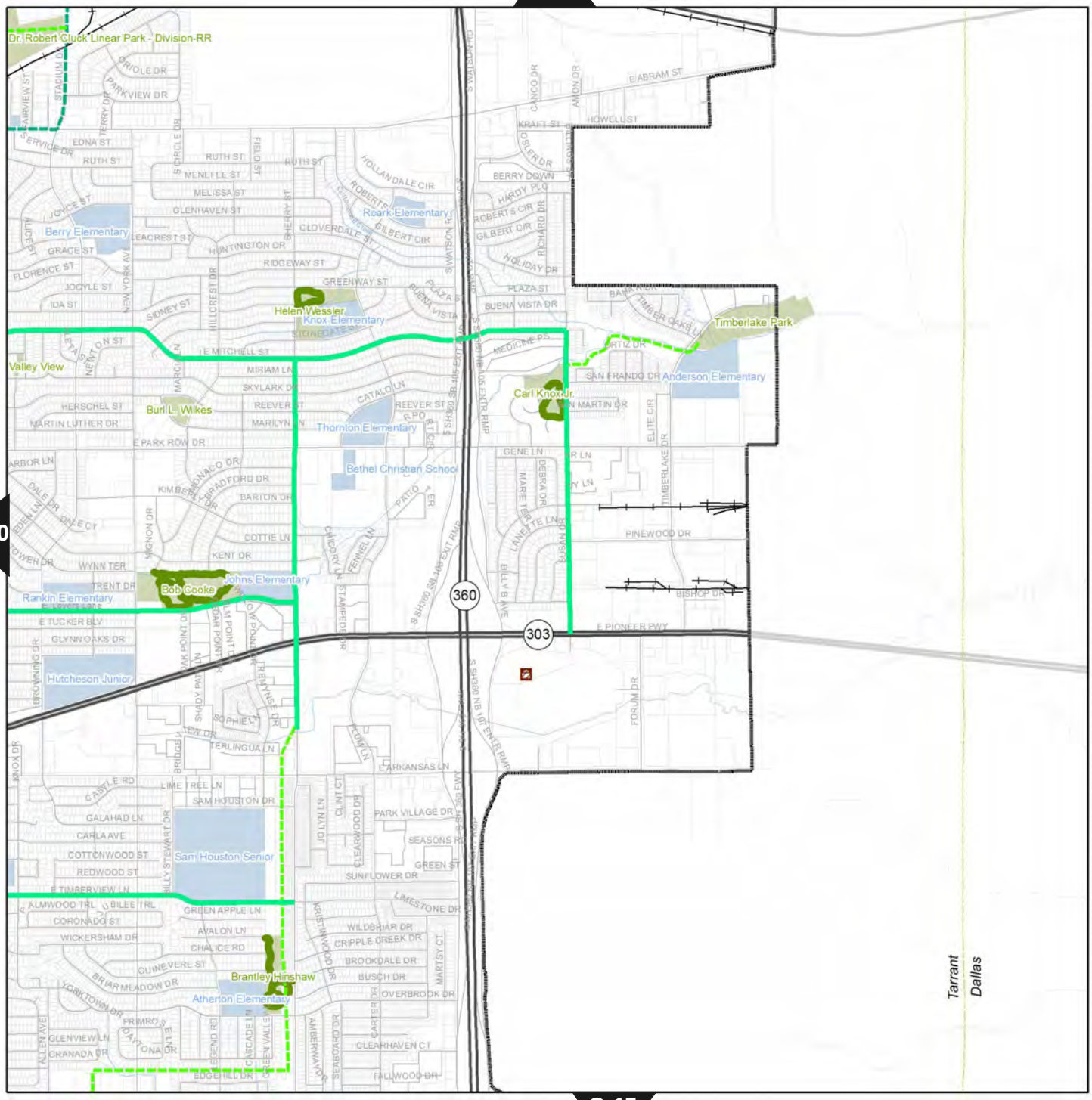
G-10



G-15

0 0.25 0.5 1 Miles

Bike Tile 10

Legend

Bike Recommendations
- Existing Bike Lane
- Existing Paved Shoulder
- Bike Lane, New Construction
- Bike Lane, Road Diet
- Bike Lane, Stripe
- Paved Shoulder, New Construction
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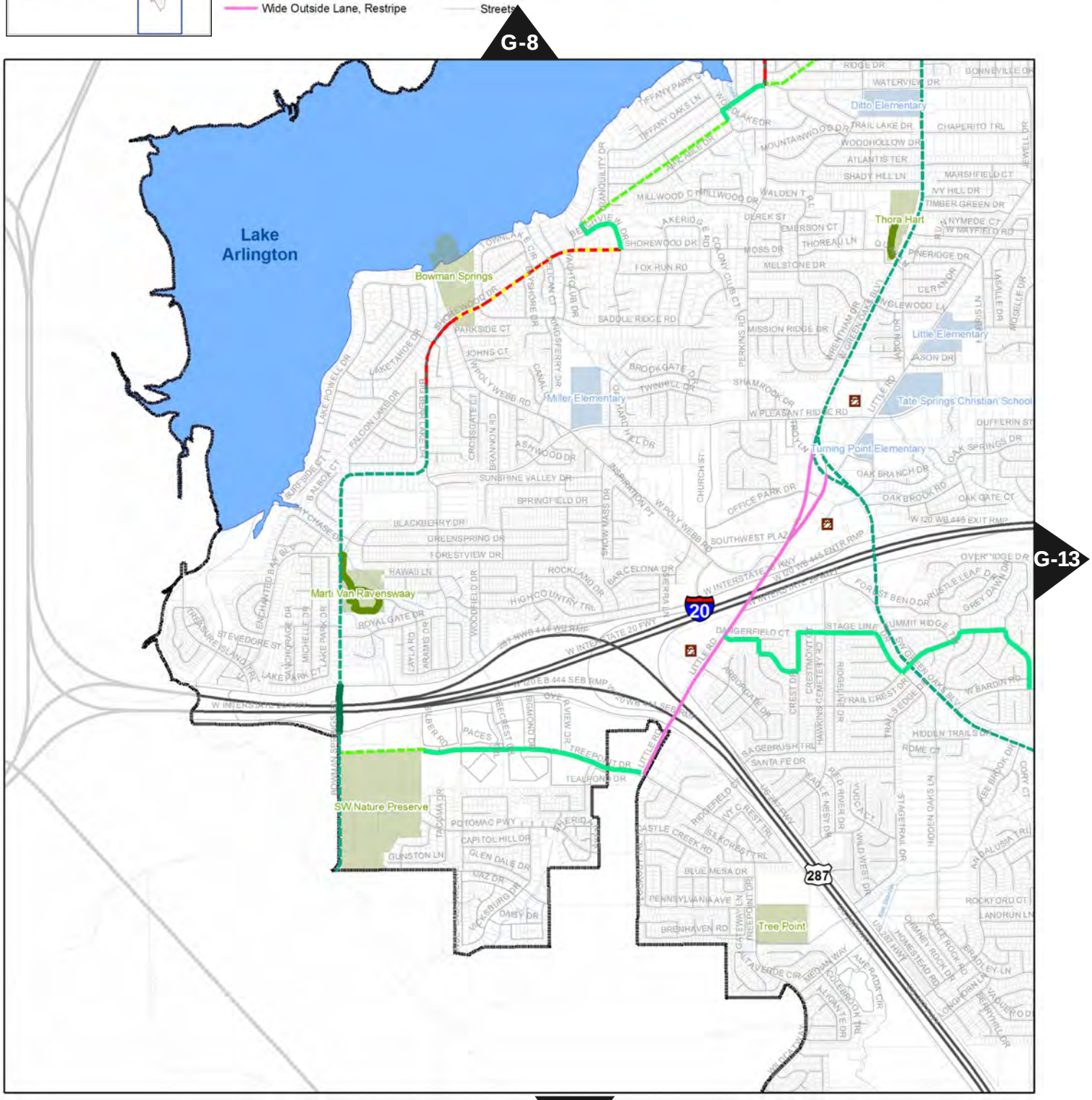

0 0.25 0.5 1 Miles

Bike Tile 11

Legend

Bike Recommendations
- Existing Bike Lane
- Existing Paved Shoulder
- Bike Lane, New Construction
- Bike Lane, Road Diet
- Bike Lane, Stripe
- Paved Shoulder, New Construction
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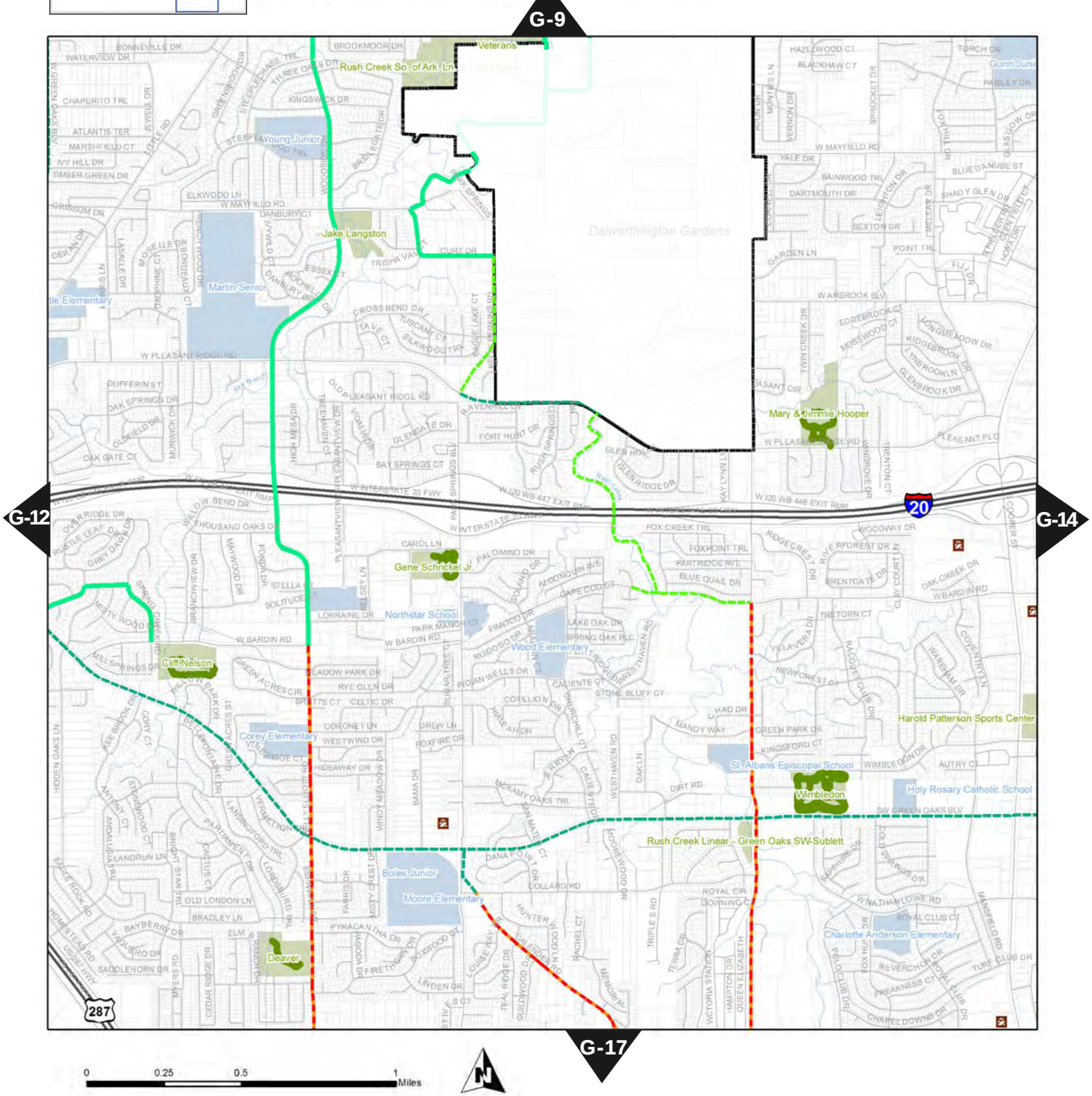

Bike Tile 12

Legend

Bike Recommendations
- Existing Bike Lane
- Existing Paved Shoulder
- Bike Lane, New Construction
- Bike Lane, Road Diet
- Bike Lane, Stripe
- Paved Shoulder, New Construction
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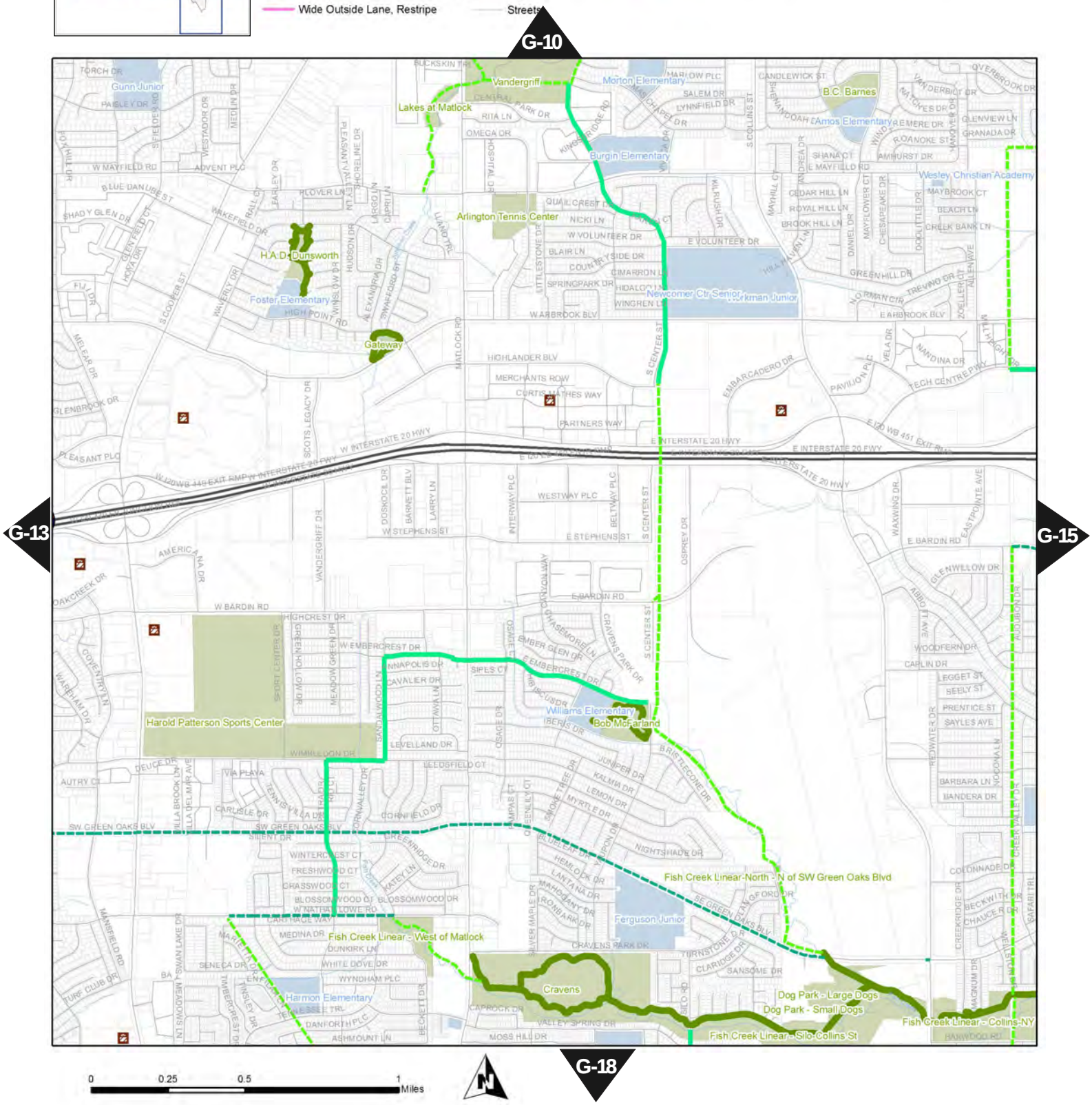
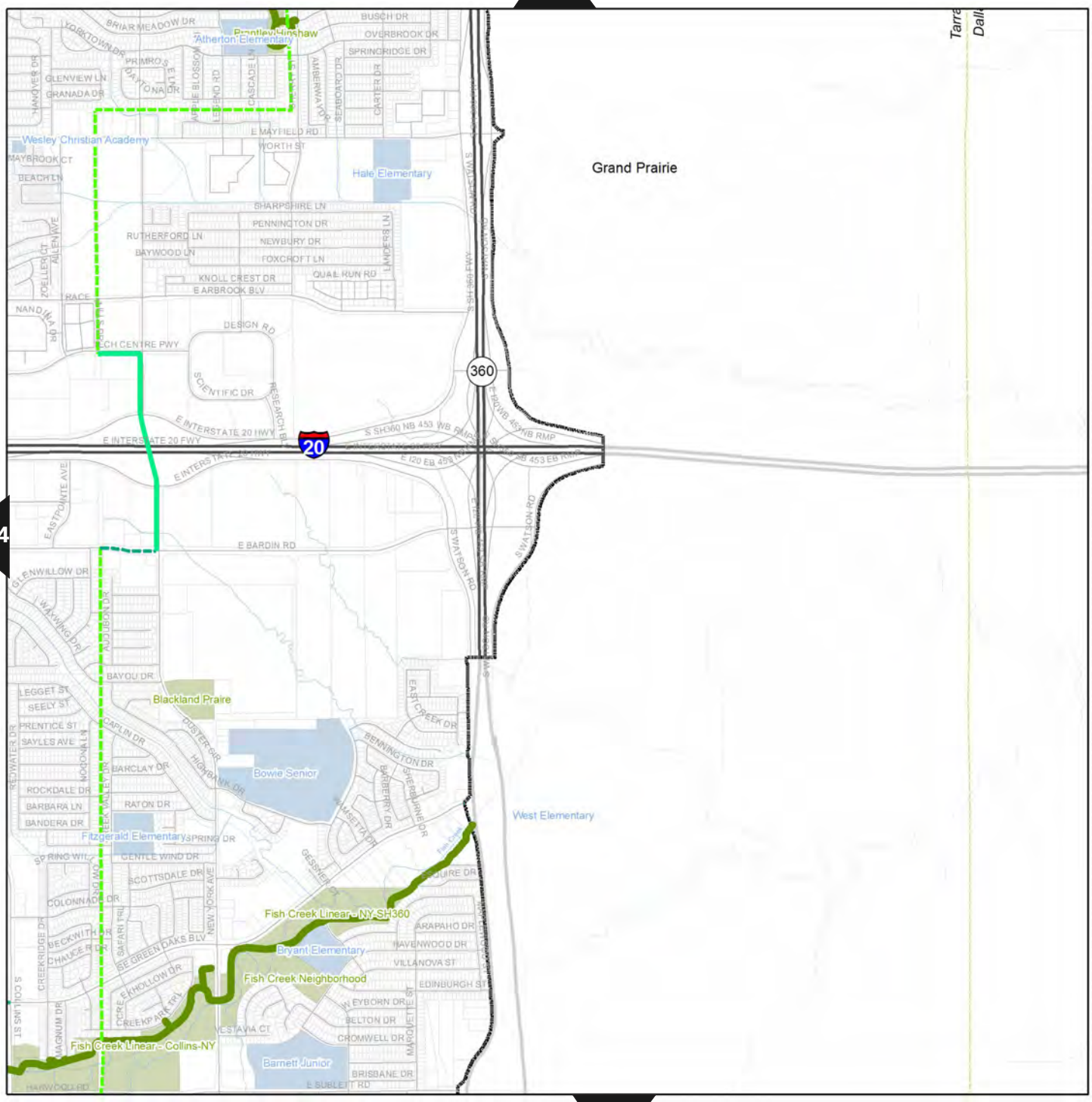


Bike Tile 13

Legend

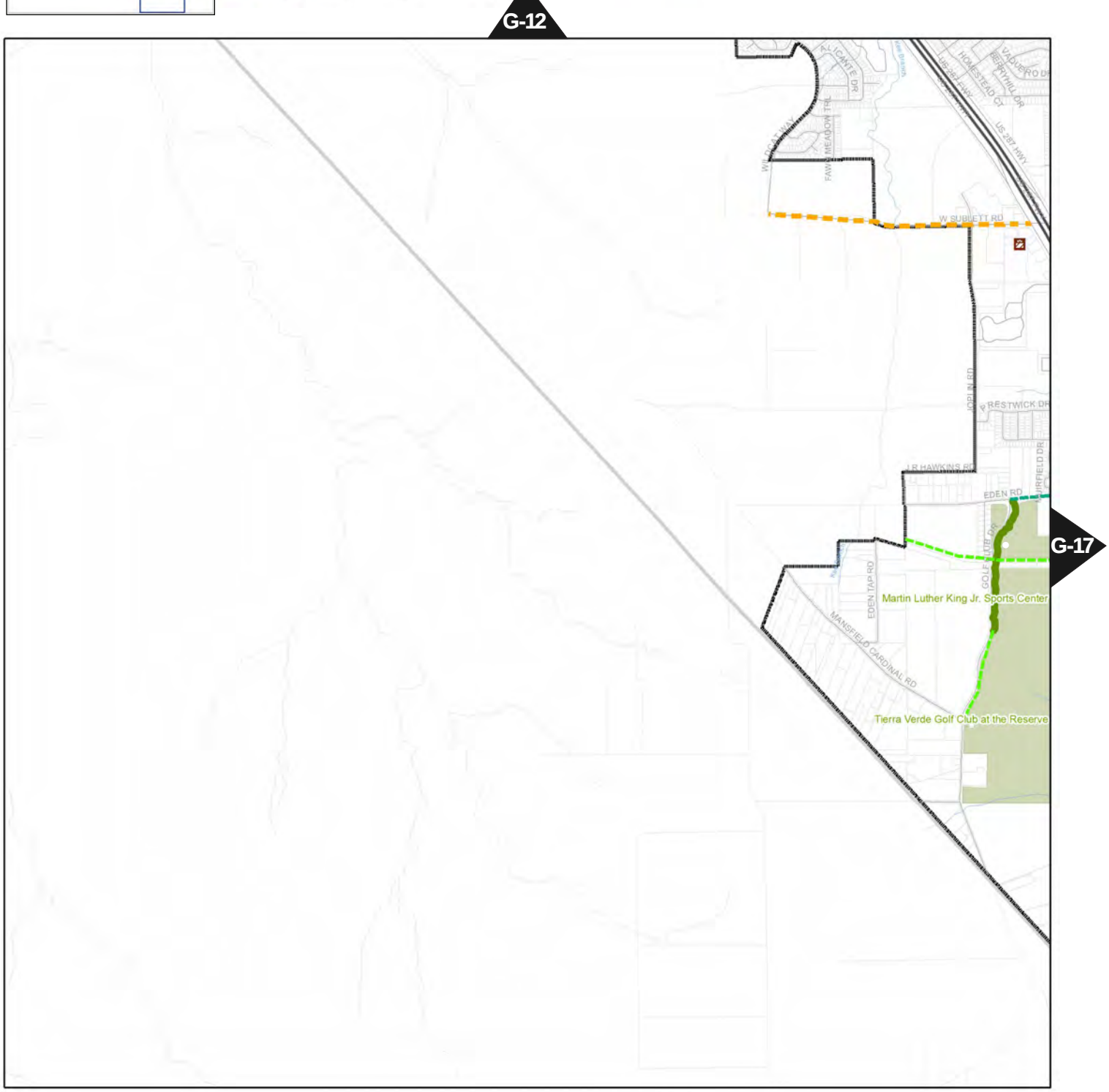
Bike Recommendations
- Existing Bike Lane
- Existing Paved Shoulder
- Bike Lane, New Construction
- Bike Lane, Road Diet
- Bike Lane, Stripe
- Paved Shoulder, New Construction
- Wide Outside Lane, Restripe
- Bike Route
- Recommended Trails
- Recommended Sidepaths
- Existing Trails
- Existing Sidepaths
- Railroad
- Highways
- Streets
- Streams
- Shopping Centers
- Downtown Business District
- UT-Arlington
- Tarrant County College - SE Campus
- Schools
- Parks
- Lake
- Parcels
- Arlington Municipal Boundary
- County Boundary



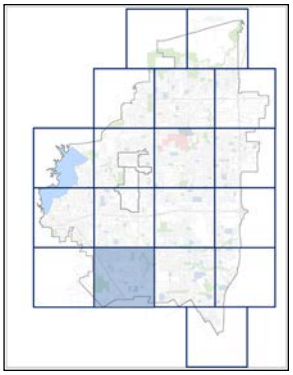
Bike Tile 14

Legend

Bike Recommendations
- Existing Bike Lane
- Existing Paved Shoulder
- Bike Lane, New Construction
- Bike Lane, Road Diet
- Bike Lane, Stripe
- Paved Shoulder, New Construction
- Wide Outside Lane, Restripe
- Bike Route
- Recommended Trails
- Recommended Sidepaths
- Existing Trails
- Existing Sidepaths
- Railroad
- Highways
- Streets
- Streams
- Shopping Centers
- Downtown Business District
- UT-Arlington
- Tarrant County College - SE Campus
- Schools
- Parks
- Lake
- Parcels
- Arlington Municipal Boundary
- County Boundary

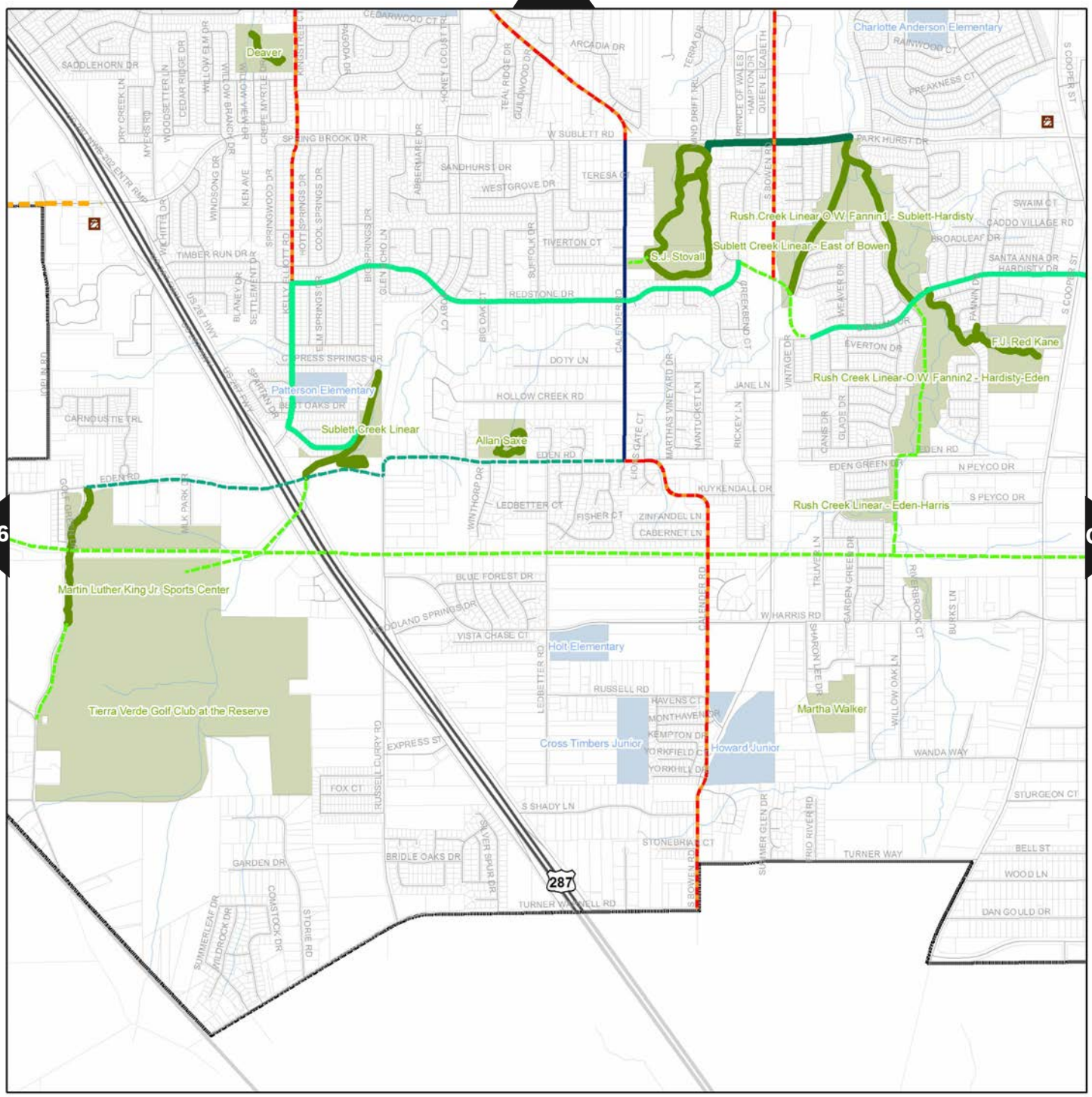


Bike Tile 15



Legend

Bike Recommendations
- Existing Bike Lane
- Existing Paved Shoulder
- Bike Lane, New Construction
- Bike Lane, Road Diet
- Bike Lane, Stripe
- Paved Shoulder, New Construction
- Wide Outside Lane, Restripe
- Bike Route
- Recommended Trails
- Recommended Sidepaths
- Existing Trails
- Existing Sidepaths
- Railroad
- Highways
- Streets
- Streams
- Shopping Centers
- Downtown Business District
- UT-Arlington
- Tarrant County College - SE Campus
- Schools
- Parks
- Lake
- Parcels
- Arlington Municipal Boundary
- County Boundary



0 0.25 0.5 1 Miles

Bike Tile 16

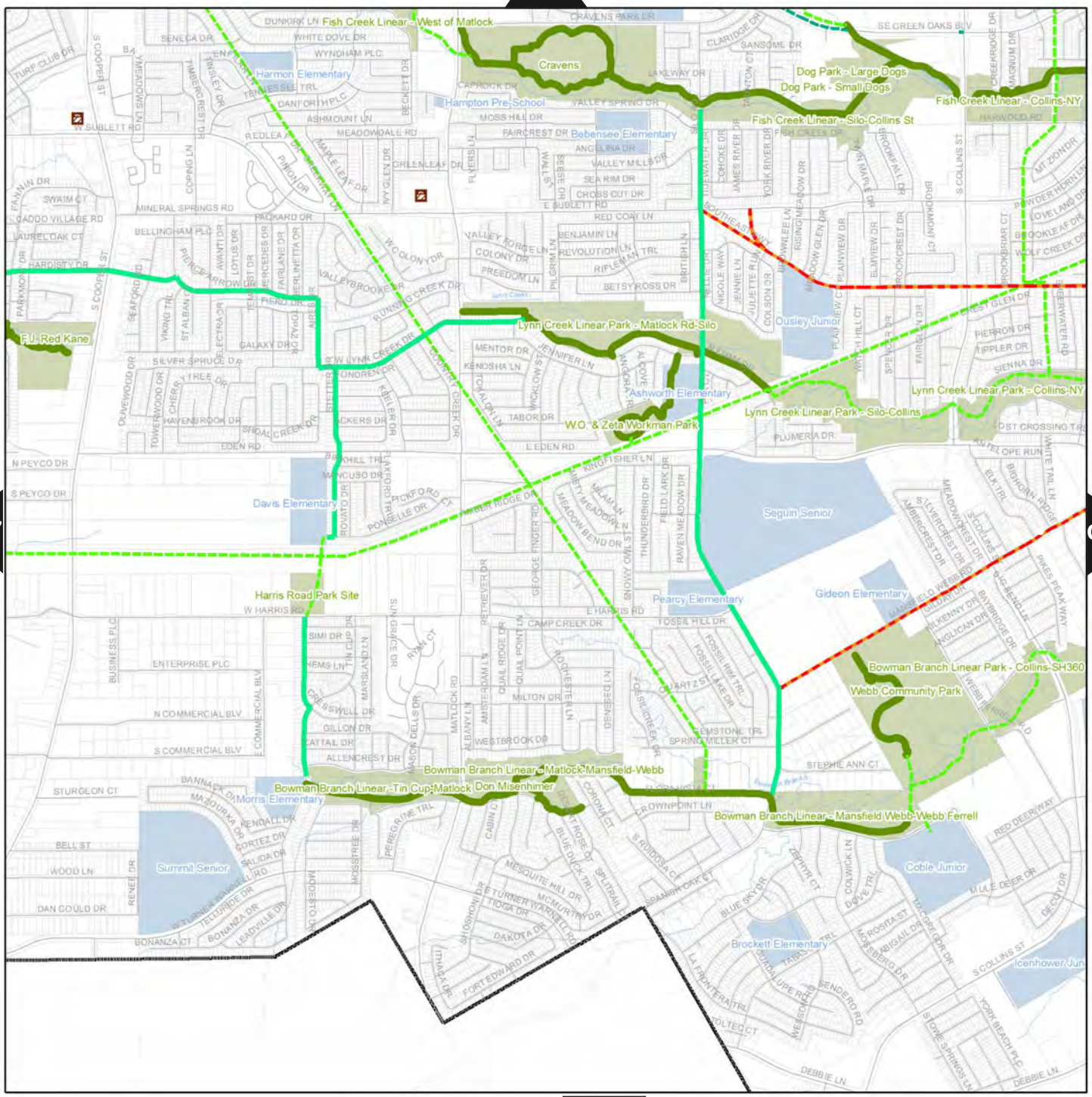
Legend

Bike Recommendations
- Existing Bike Lane
- Existing Paved Shoulder
- Bike Lane, New Construction
- Bike Lane, Road Diet
- Bike Lane, Stripe
- Paved Shoulder, New Construction
- Wide Outside Lane, Restripe
- Bike Route
- Recommended Trails
- Recommended Sidepaths
- Existing Trails
- Existing Sidepaths
- Railroad
- Highways
- Streets
- Streams
- Shopping Centers
- Downtown Business District
- UT-Arlington
- Tarrant County College - SE Campus
- Schools
- Parks
- Lake
- Parcels
- Arlington Municipal Boundary
- County Boundary

G-14

G-17

G-19



G-20

0 0.25 0.5 1 Miles

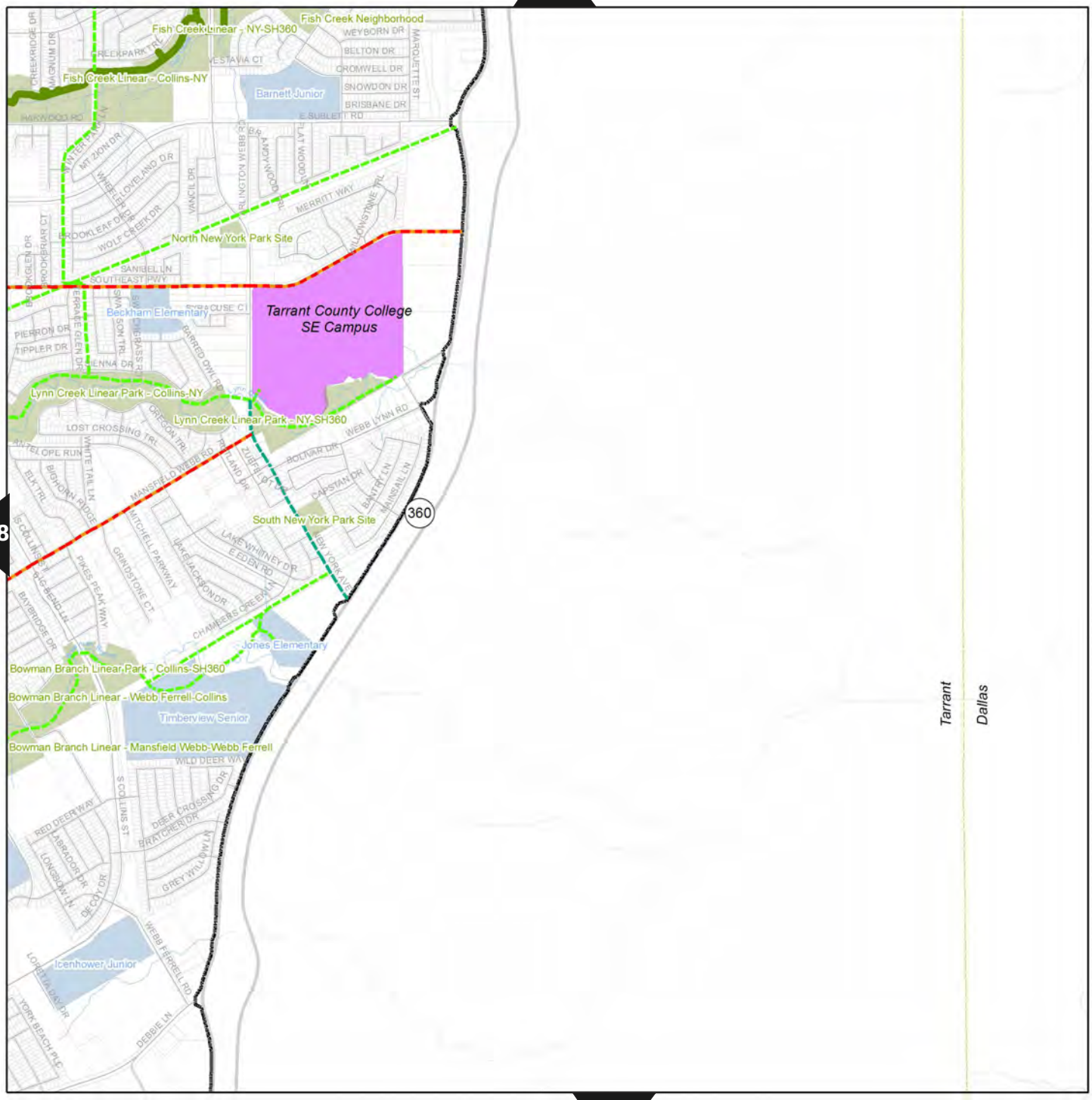
Bike Tile 17

Legend

Bike Recommendations
- Existing Bike Lane
- Existing Paved Shoulder
- Bike Lane, New Construction
- Bike Lane, Road Diet
- Bike Lane, Stripe
- Paved Shoulder, New Construction
- Wide Outside Lane, Restripe
- Bike Route
- Recommended Trails
- Recommended Sidepaths
- Existing Trails
- Existing Sidepaths
- Railroad
- Highways
- Streets
- Streams
- Shopping Centers
- Downtown Business District
- UT-Arlington
- Tarrant County College - SE Campus
- Schools
- Parks
- Lake
- Parcels
- Arlington Municipal Boundary
- County Boundary

G-15

G-18



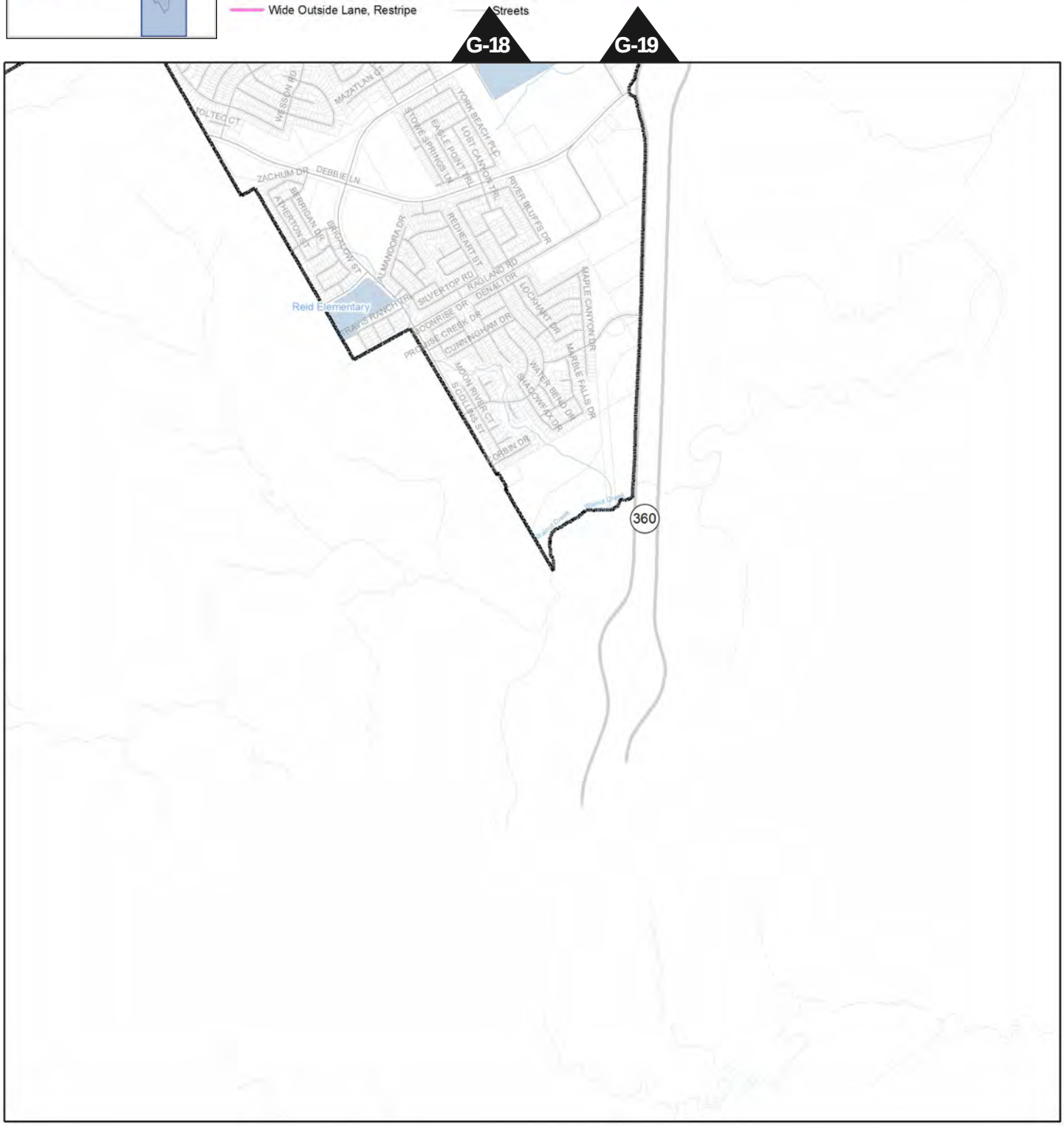
G-20

0 0.25 0.5 1 Miles

Bike Tile 18

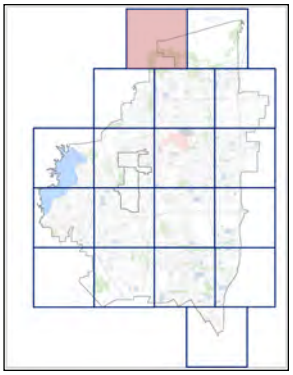
Legend

Bike Recommendations
- Existing Bike Lane
- Existing Paved Shoulder
- Bike Lane, New Construction
- Bike Lane, Road Diet
- Bike Lane, Stripe
- Paved Shoulder, New Construction
- Wide Outside Lane, Restripe
- Bike Route
- Recommended Trails
- Recommended Sidepaths
- Existing Trails
- Existing Sidepaths
- Railroad
- Highways
- Streets
- Streams
- Shopping Centers
- Downtown Business District
- UT-Arlington
- Tarrant County College - SE Campus
- Schools
- Parks
- Lake
- Parcels
- Arlington Municipal Boundary
- County Boundary



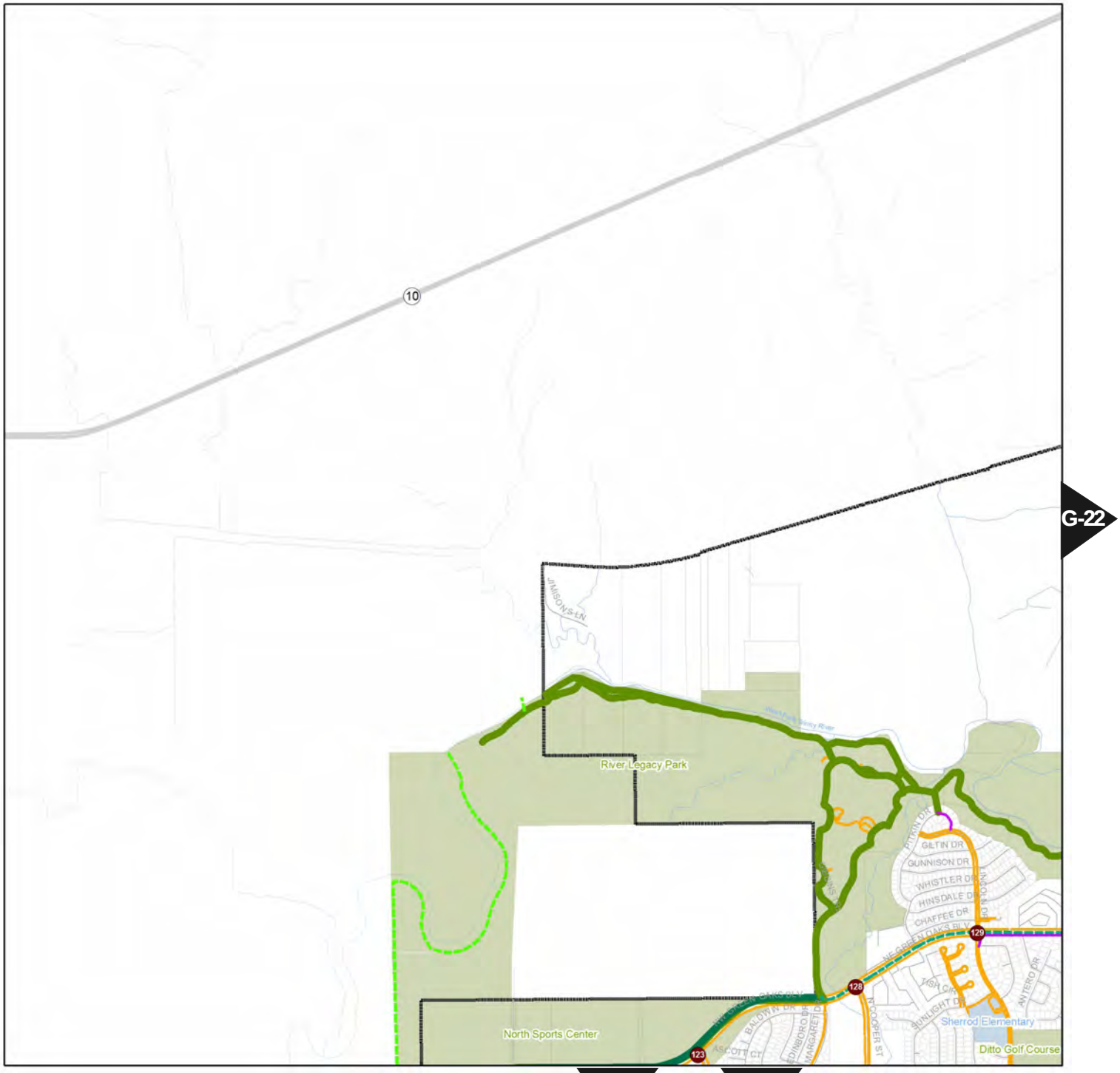
0 0.25 0.5 1 Miles

Hike Tile 1



Legend

- Intersection Improvements
- Shopping Centers
- Recommended Sidewalk Network
- Existing Sidewalks
- Streams
- Railroad
- Recommended Trails
- Recommended Sidepaths
- Existing Trails
- Existing Sidepaths
- Highways
- Streets
- Downtown Business District
- UT-Arlington
- Tarrant County College - SE Campus
- Schools
- Parks
- Lake
- Parcels
- Arlington Municipal Boundary
- County Boundary



0 0.25 0.5 1 Miles

Hike Tile 2

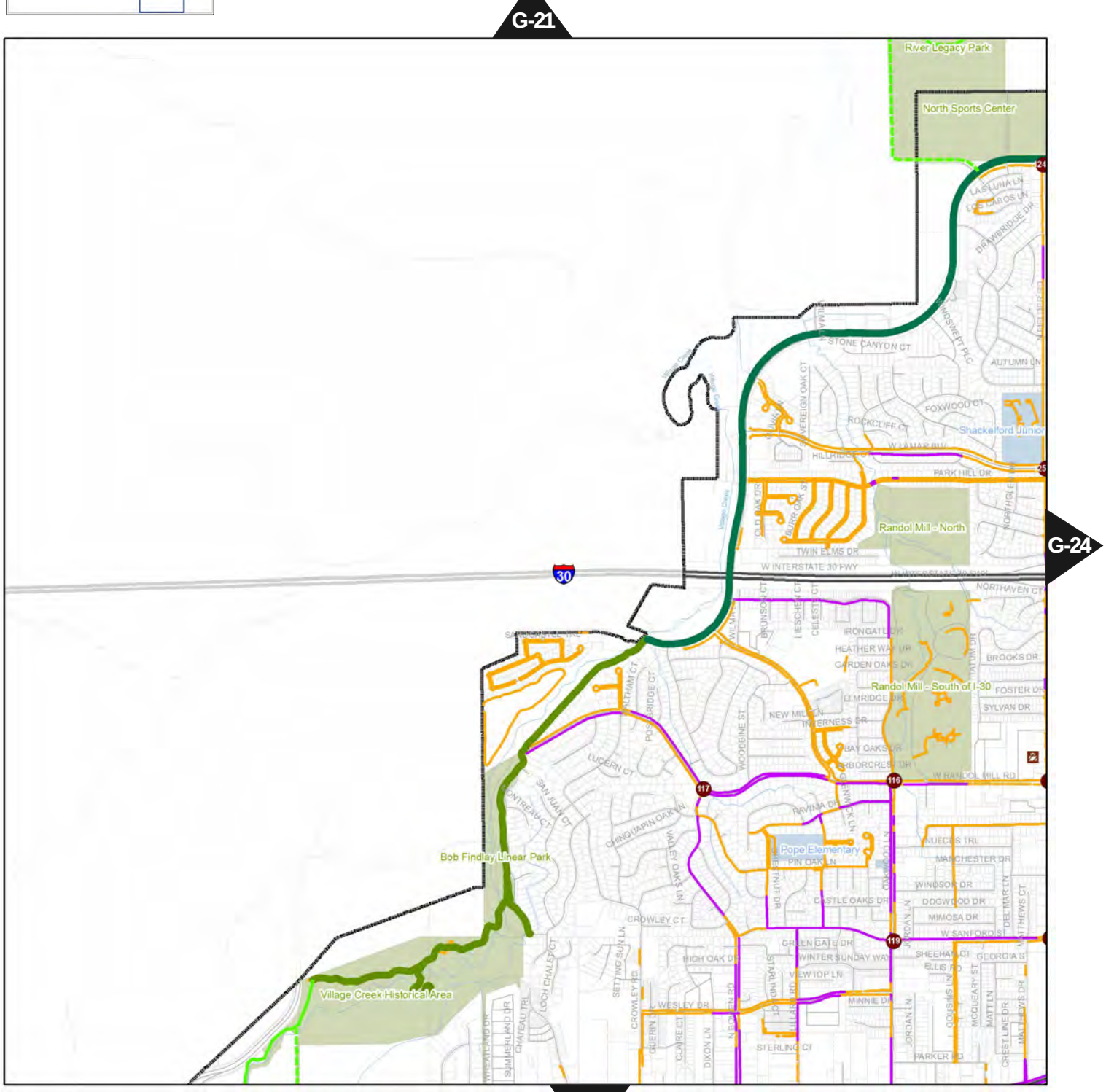
Legend

- Intersection Improvements
- Shopping Centers
- Recommended Sidewalk Network
- Existing Sidewalks
- Streams
- Railroad
- Recommended Trails
- Recommended Sidepaths
- Existing Trails
- Existing Sidepaths
- Highways
- Streets
- Downtown Business District
- UT-Arlington
- Tarrant County College - SE Campus
- Schools
- Parks
- Lake
- Parcels
- Arlington Municipal Boundary
- County Boundary

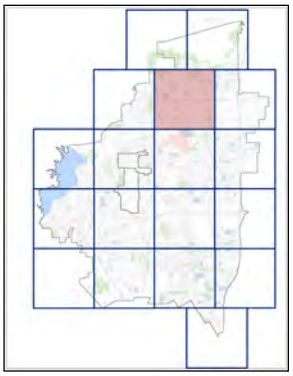
Hike Tile 3

Legend

- Intersection Improvements
- Shopping Centers
- Recommended Sidewalk Network
- Existing Sidewalks
- Streams
- Railroad
- Recommended Trails
- Recommended Sidepaths
- Existing Trails
- Existing Sidepaths
- Highways
- Streets
- Downtown Business District
- UT-Arlington
- Tarrant County College - SE Campus
- Schools
- Parks
- Lake
- Parcels
- Arlington Municipal Boundary
- County Boundary



Hike Tile 4



Legend

- Intersection Improvements
- Shopping Centers
- Recommended Sidewalk Network
- Existing Sidewalks
- Streams
- Railroad
- Recommended Trails
- Recommended Sidepaths
- Existing Trails
- Existing Sidepaths
- Highways
- Streets
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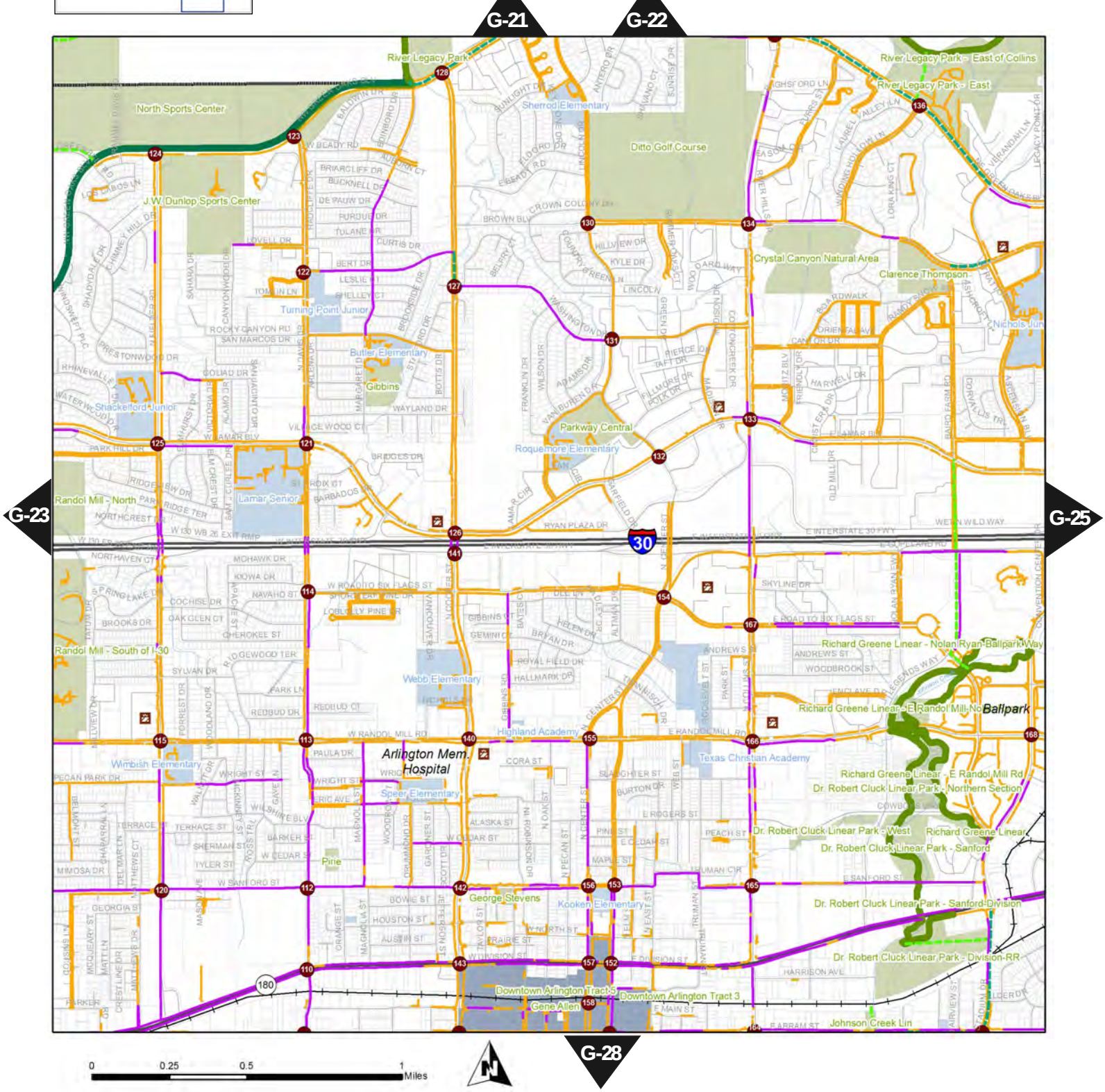
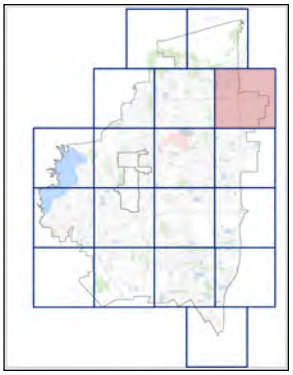
- County Boundary



Hike Tile 5



Legend

- Intersection Improvements
- Shopping Centers
- Recommended Sidewalk Network
- Existing Sidewalks
- Streams
- Railroad
- Recommended Trails
- Recommended Sidepaths
- Existing Trails
- Existing Sidepaths
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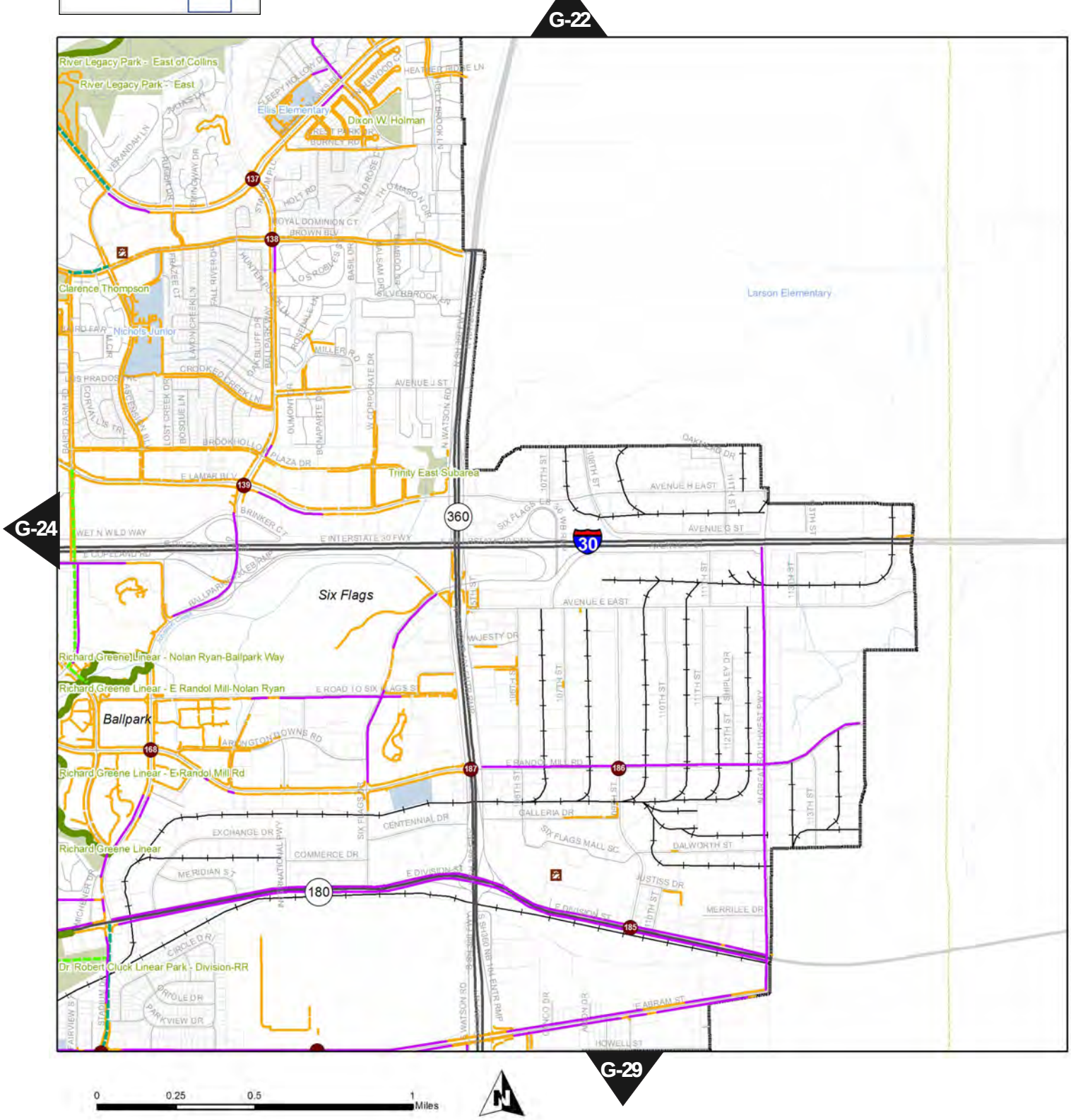
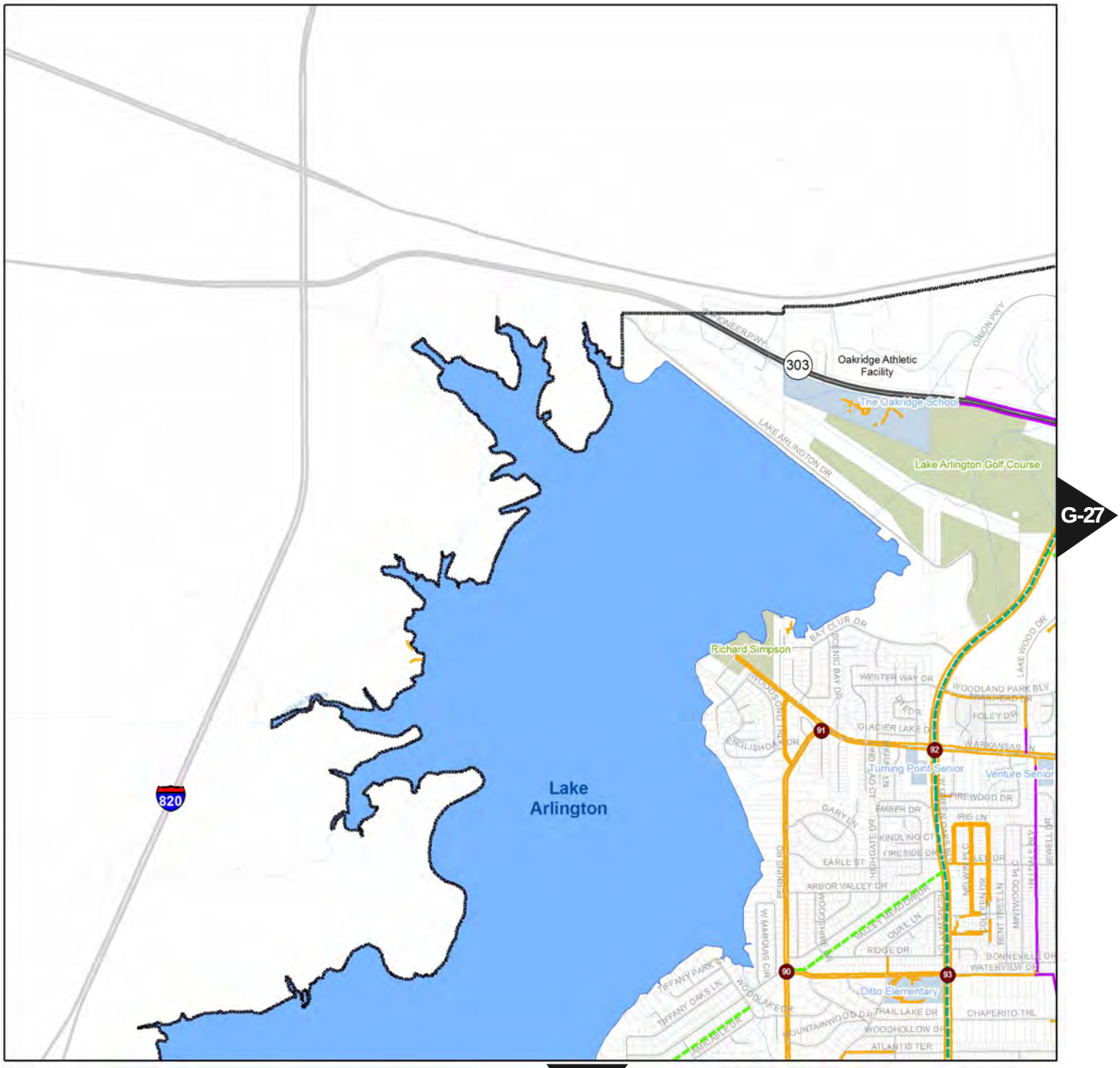


0 0.25 0.5 1 Miles

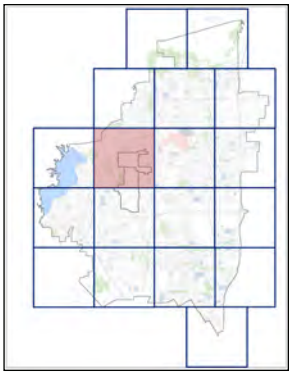
Hike Tile 6

Legend

- Intersection Improvements
- Shopping Centers
- Recommended Sidewalk Network
- Existing Sidewalks
- Streams
- Railroad
- Recommended Trails
- Recommended Sidepaths
- Existing Trails
- Existing Sidepaths
- Highways
- Streets
- Downtown Business District
- UT-Arlington
- Tarrant County College - SE Campus
- Schools
- Parks
- Lake
- Parcels
- Arlington Municipal Boundary
- County Boundary



Hike Tile 7



Legend

- Intersection Improvements
- Shopping Centers
- Recommended Sidewalk Network
- Existing Sidewalks
- Streams
- Railroad
- Recommended Trails
- Recommended Sidepaths
- Existing Trails
- Existing Sidepaths
- Highways
- Streets
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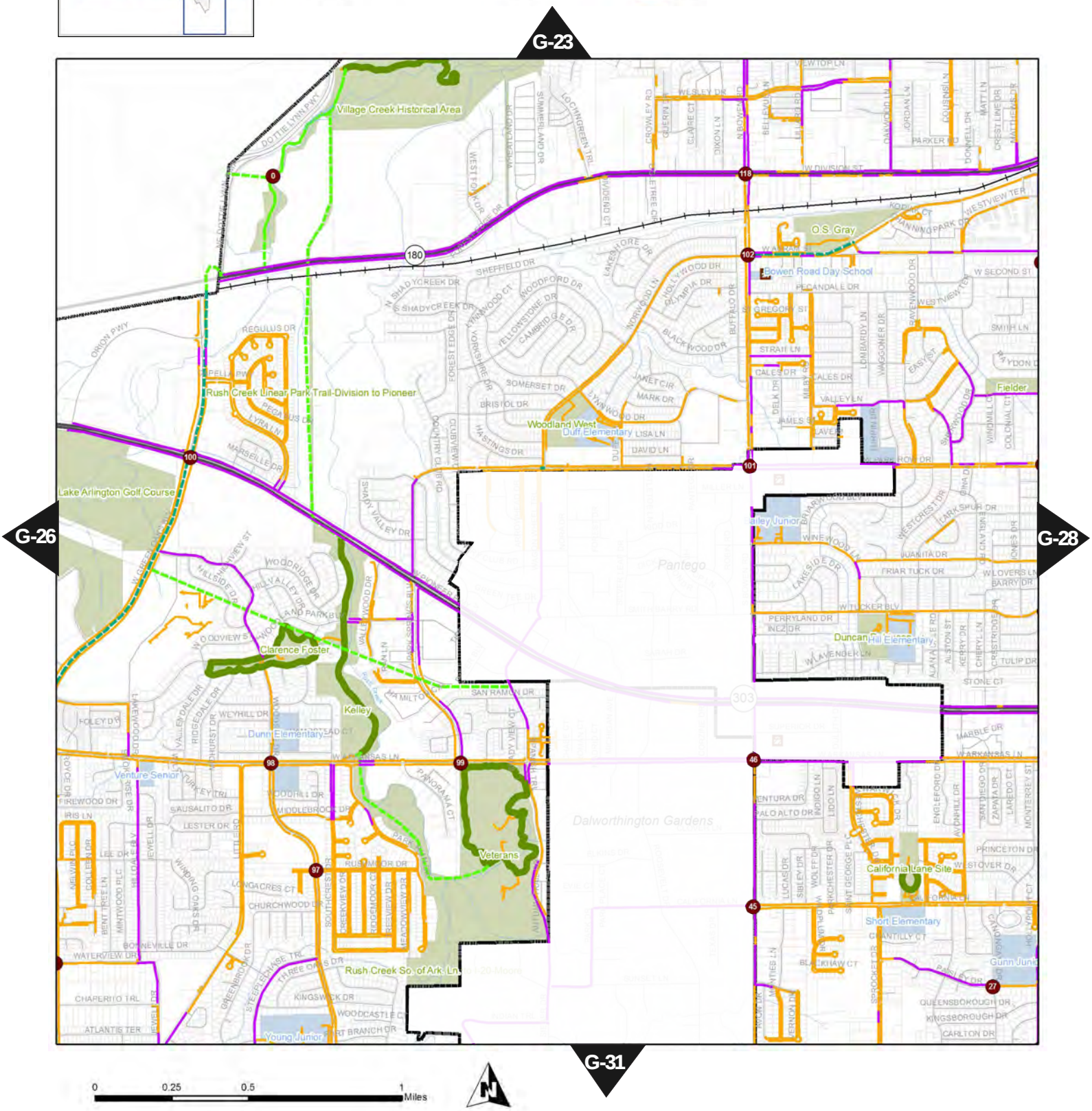
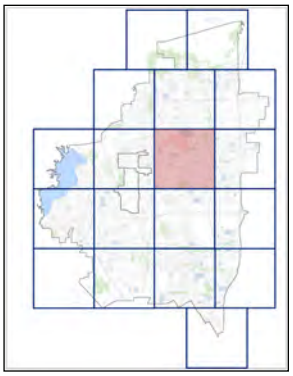
- UT-Arlington
- Tarrant County College - SE Campus
- Schools
- Parks
- Lake
- Parcels
- Arlington Municipal Boundary
- County Boundary



Hike Tile 8



Legend

- Intersection Improvements
- Shopping Centers
- Recommended Sidewalk Network
- Existing Sidewalks
- Streams
- Railroad
- Recommended Trails
- Recommended Sidepaths
- Existing Trails
- Existing Sidepaths
- Highways
- Streets
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- UT-Arlington
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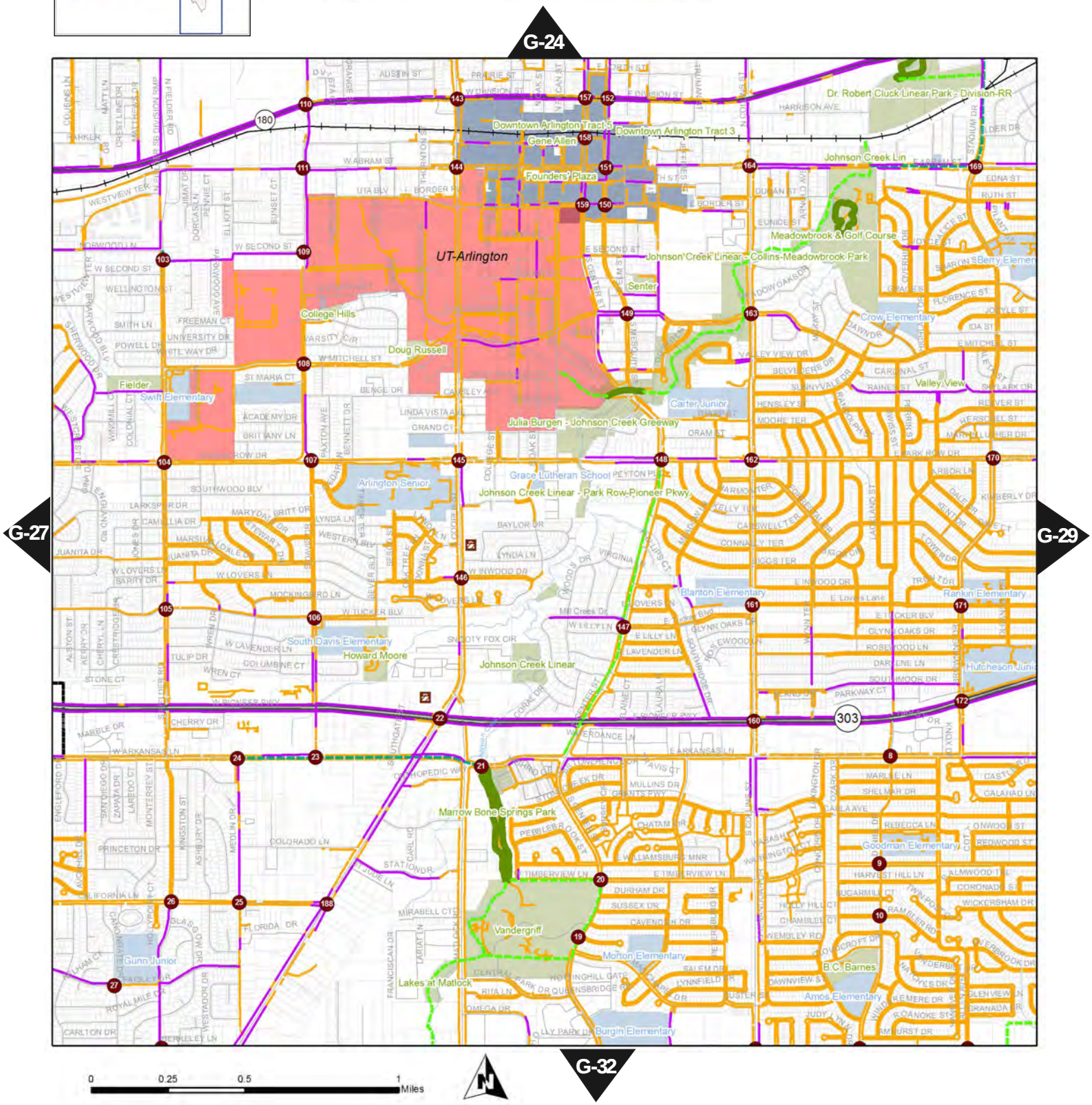
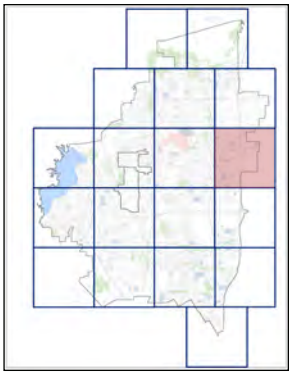
- County Boundary



Hike Tile 9



Legend

- Intersection Improvements
- Shopping Centers
- Recommended Sidewalk Network
- Existing Sidewalks
- Streams
- Railroad
- Recommended Trails
- Recommended Sidepaths
- Existing Trails
- Existing Sidepaths
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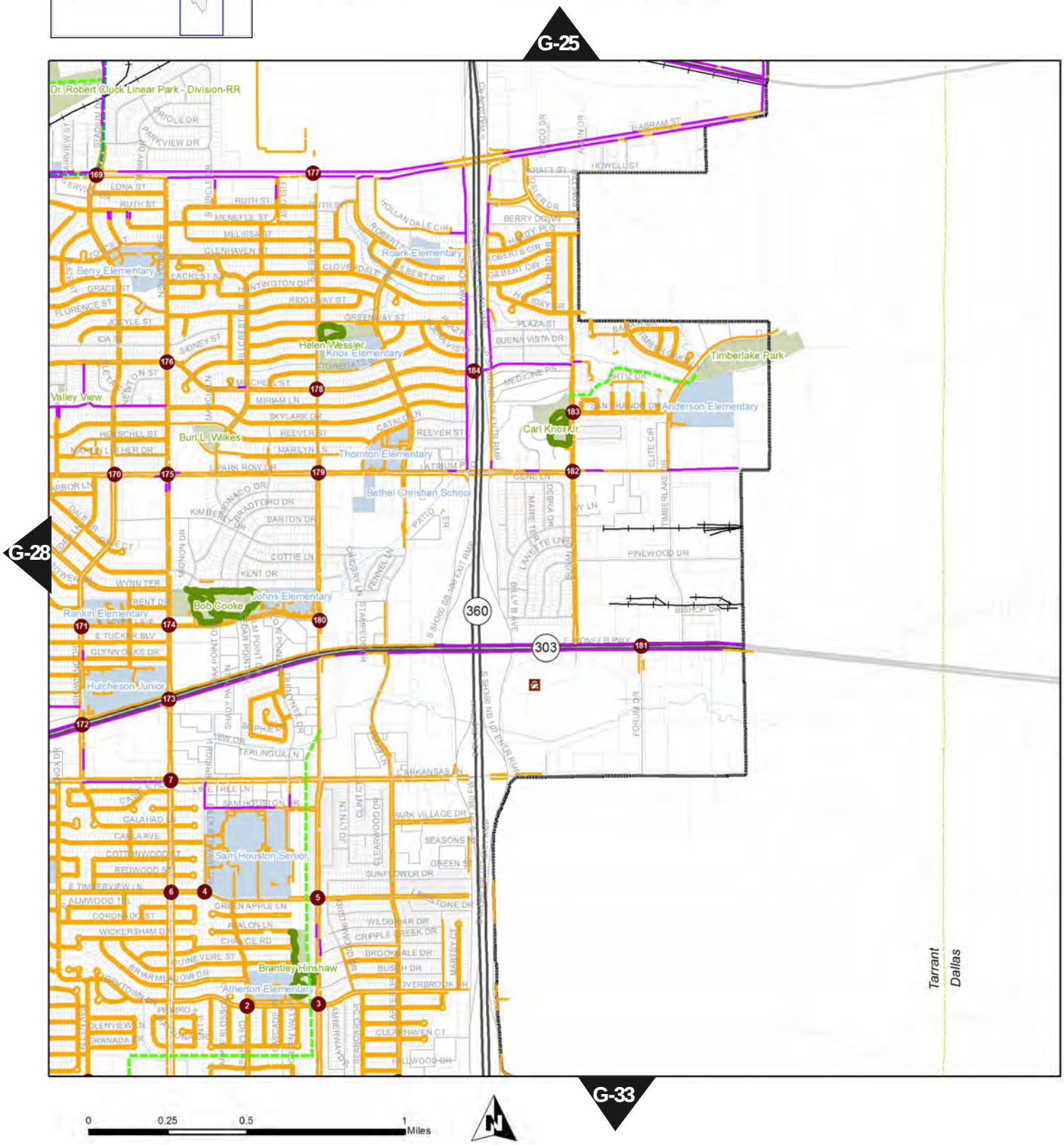
- County Boundary



0 0.25 0.5 1 Miles

Hike Tile 10

Legend

- Intersection Improvements
- Shopping Centers
- Recommended Sidewalk Network
- Existing Sidewalks
- Streams
- Railroad
- Recommended Trails
- Recommended Sidepaths
- Existing Trails
- Existing Sidepaths
- Highways
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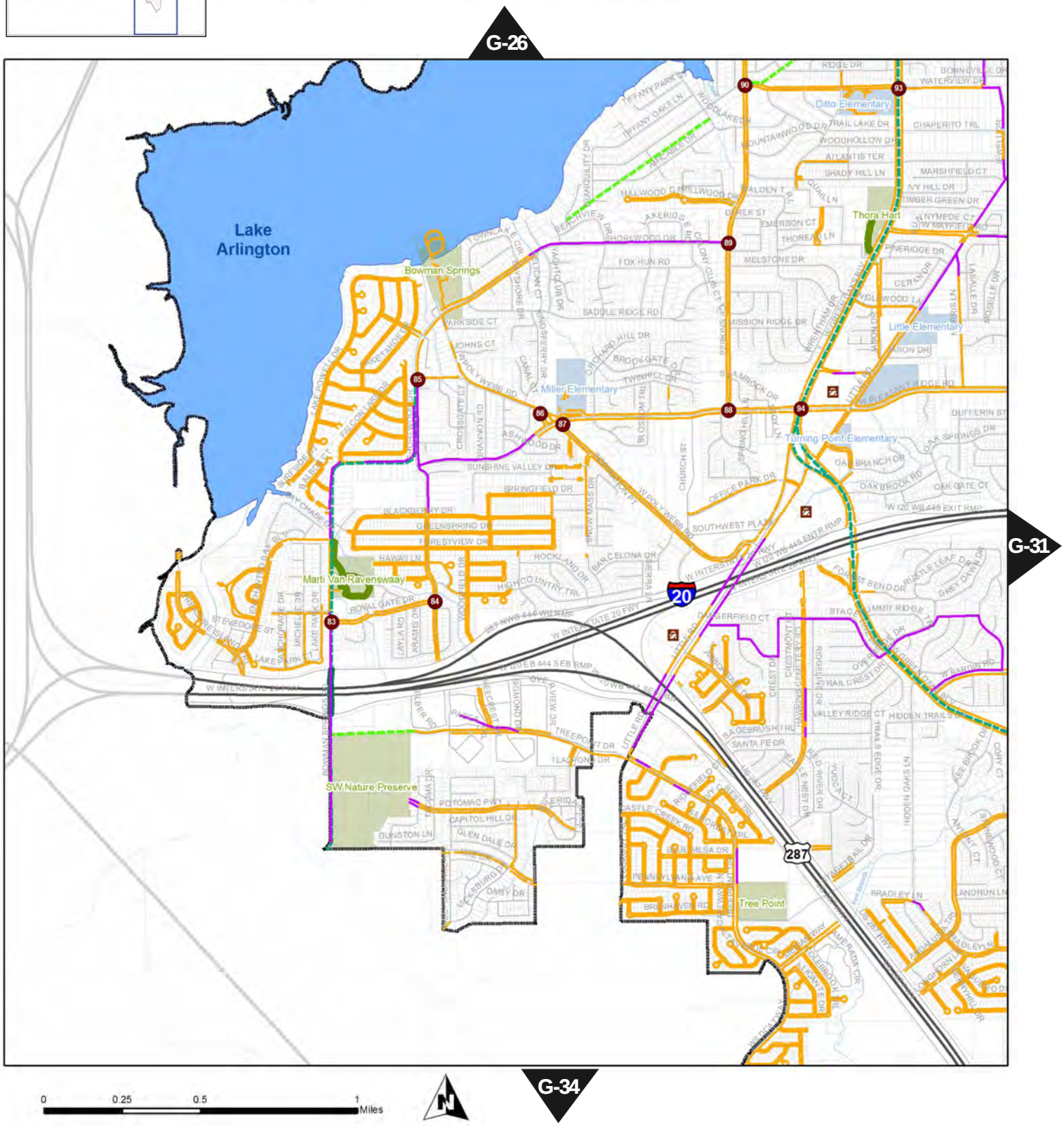
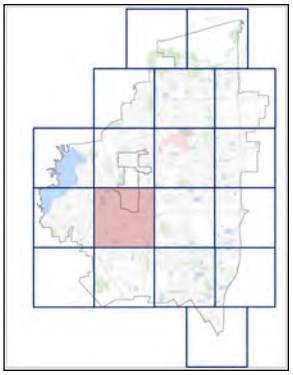
- UT-Arlington
- Tarrant County College - SE Campus
- Schools
- Parks
- Lake
- Parcels
- Arlington Municipal Boundary
- County Boundary



Hike Tile 11



Legend

- Intersection Improvements
- Shopping Centers
- Recommended Sidewalk Network
- Existing Sidewalks
- Streams
- Railroad
- Recommended Trails
- Recommended Sidepaths
- Existing Trails
- Existing Sidepaths
- Highways
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- UT-Arlington
- Tarrant County College - SE Campus
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- Parks
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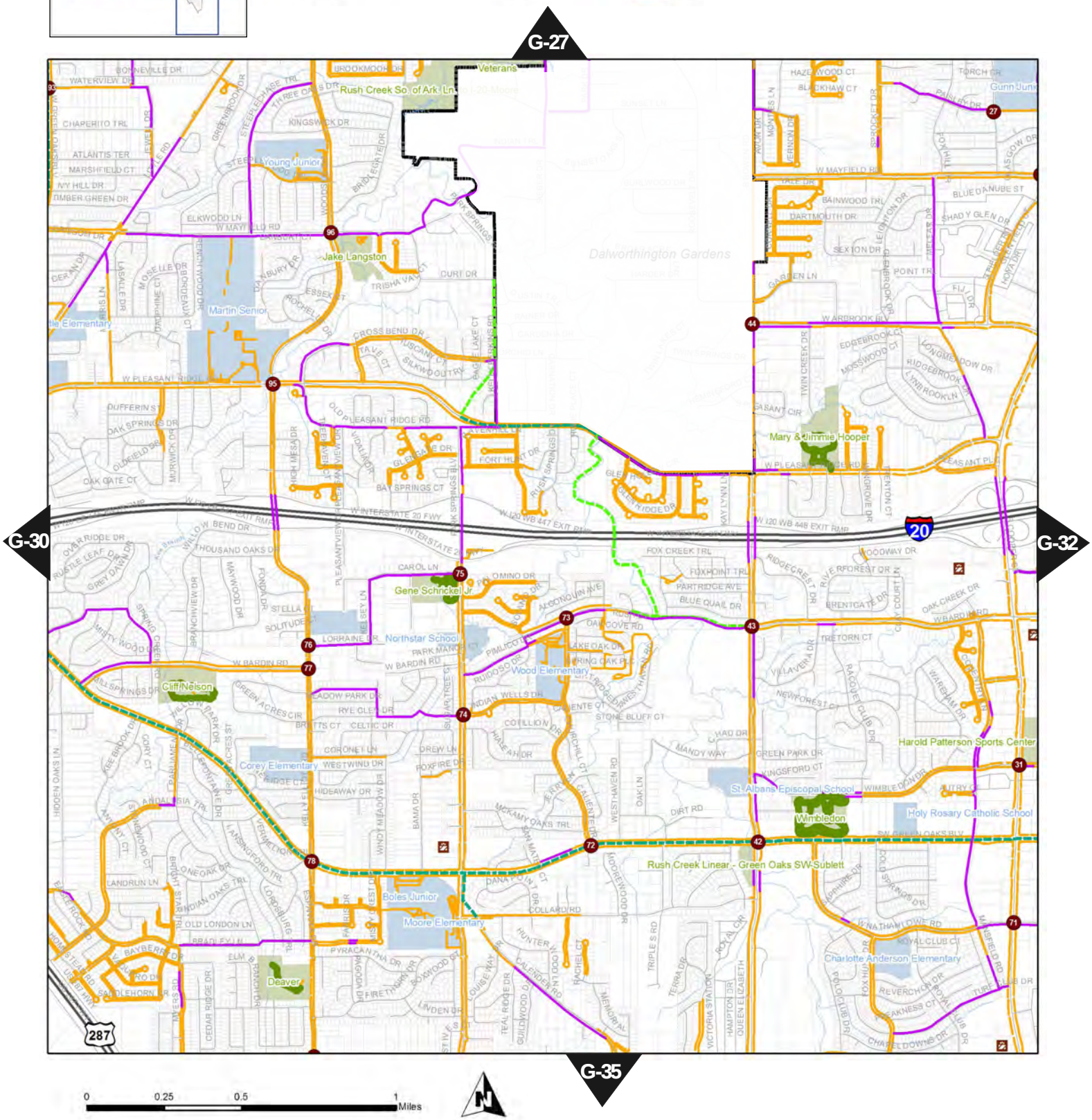
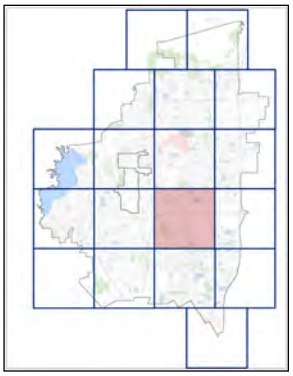
- County Boundary



0 0.25 0.5 1 Miles

Hike Tile 12



Legend

- Intersection Improvements
- Shopping Centers
- Recommended Sidewalk Network
- Existing Sidewalks
- Streams
- Railroad
- Recommended Trails
- Recommended Sidepaths
- Existing Trails
- Existing Sidepaths
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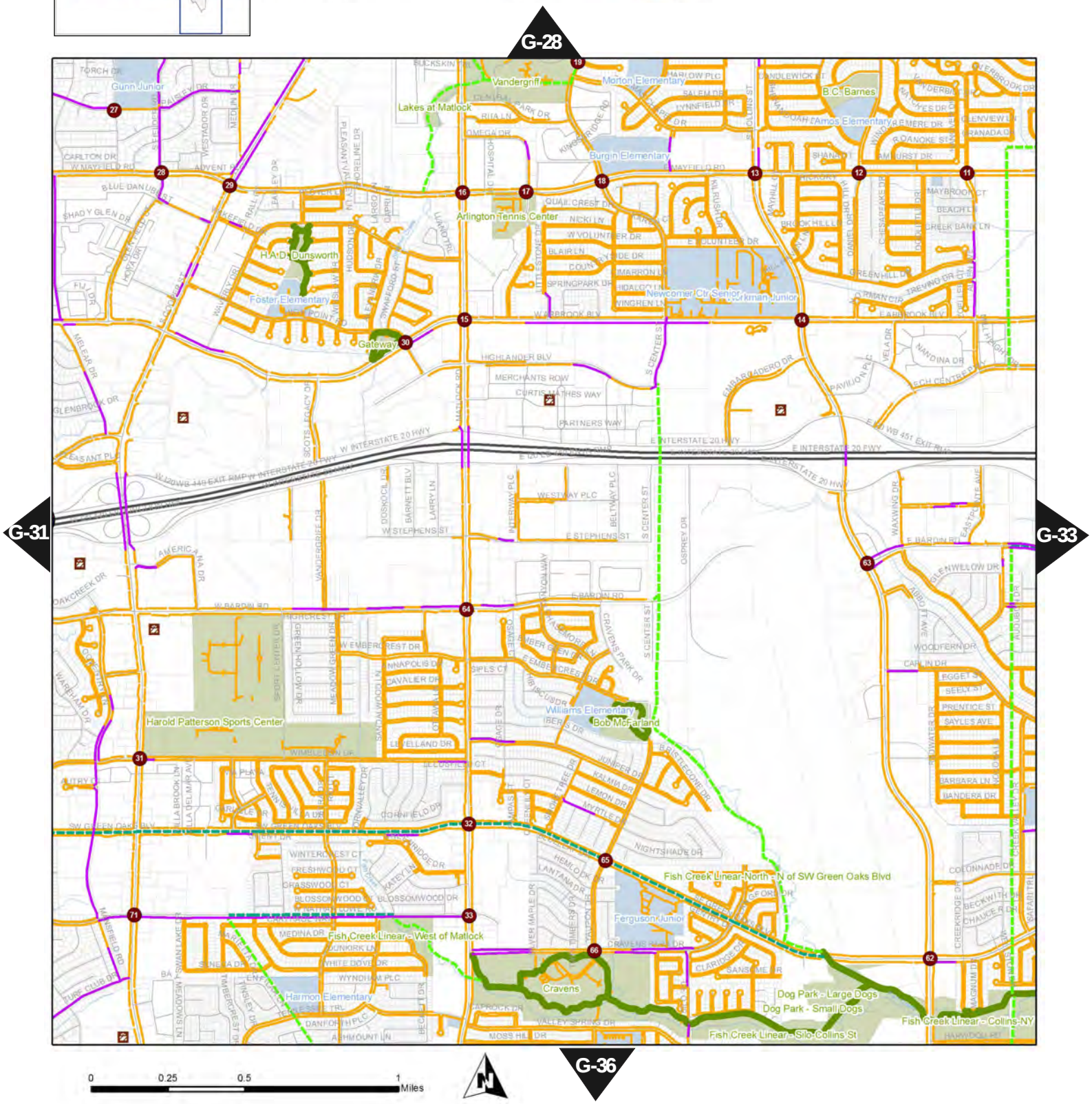
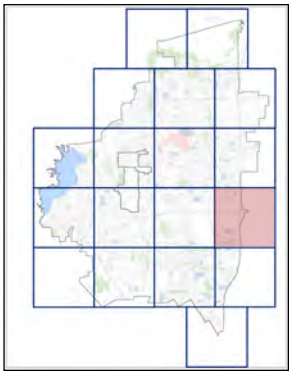


Hike Tile 13



Legend

- Intersection Improvements
- Shopping Centers
- Recommended Sidewalk Network
- Existing Sidewalks
- Streams
- Railroad
- Recommended Trails
- Recommended Sidepaths
- Existing Trails
- Existing Sidepaths
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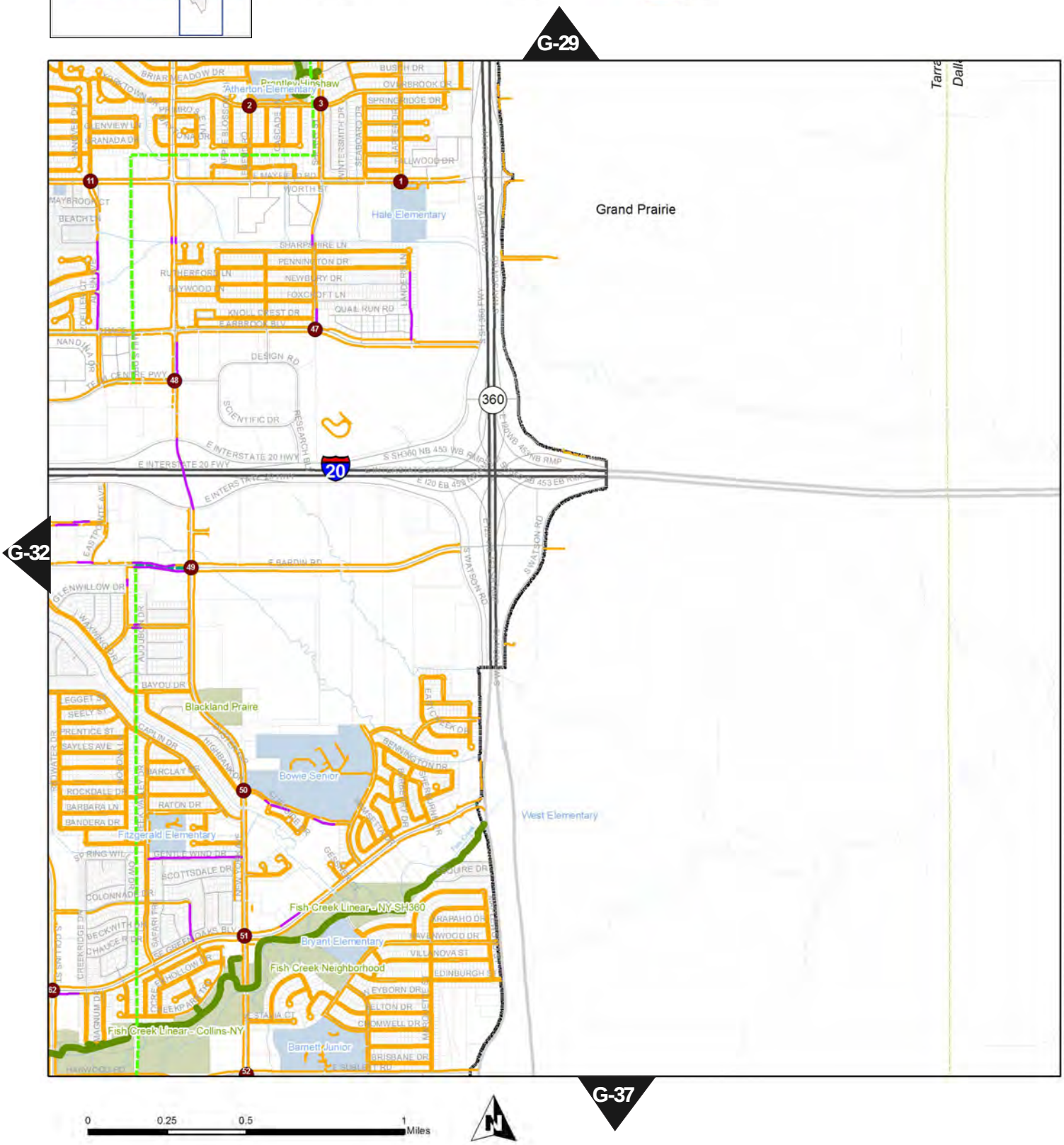
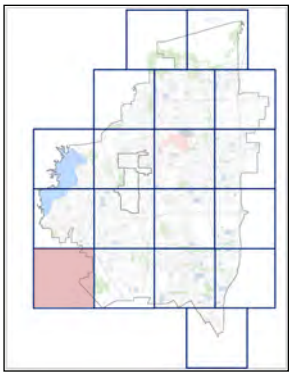


Hike Tile 14



Legend

- Intersection Improvements
- Shopping Centers
- Recommended Sidewalk Network
- Existing Sidewalks
- Streams
- Railroad
- Recommended Trails
- Recommended Sidepaths
- Existing Trails
- Existing Sidepaths
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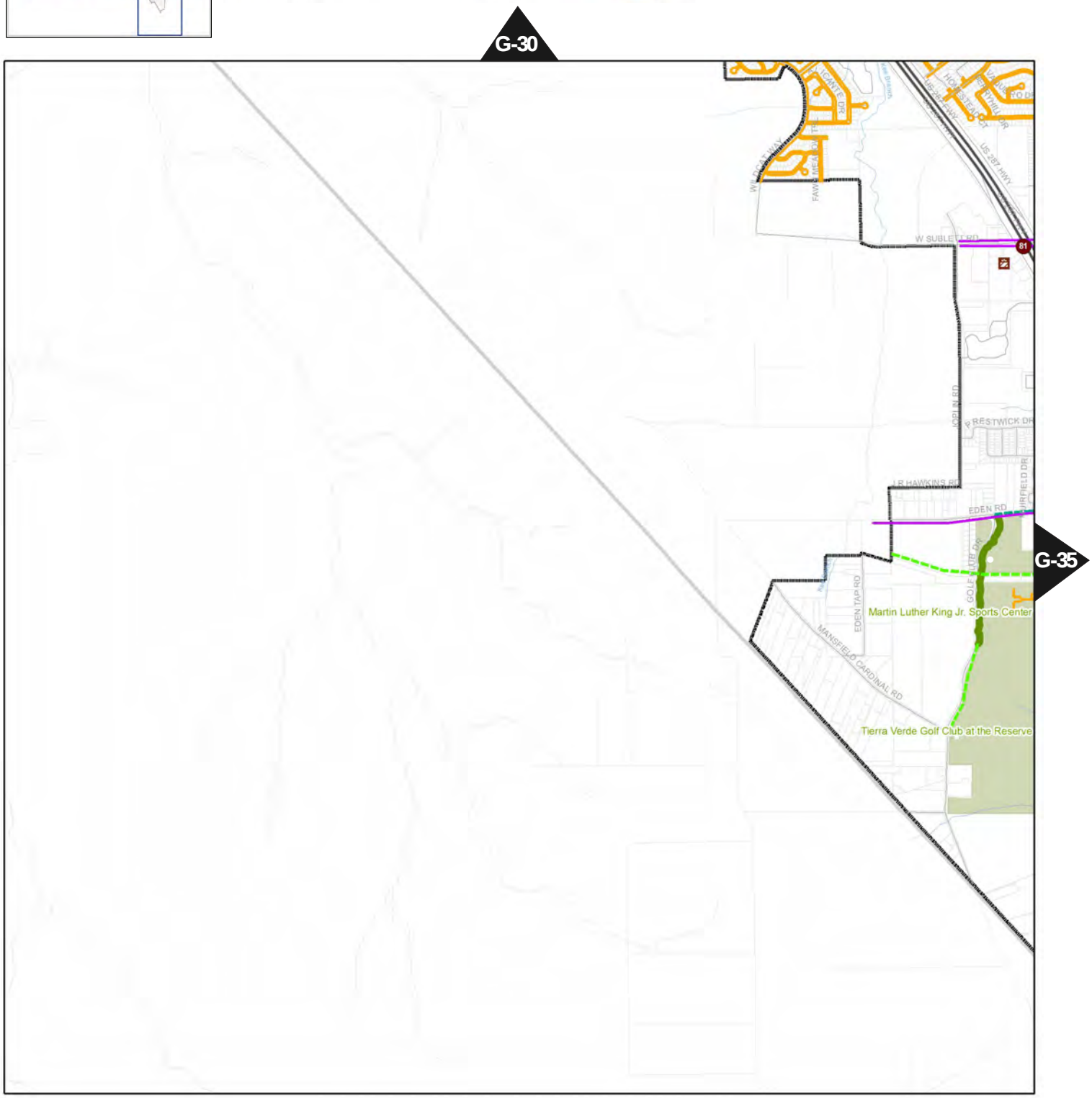
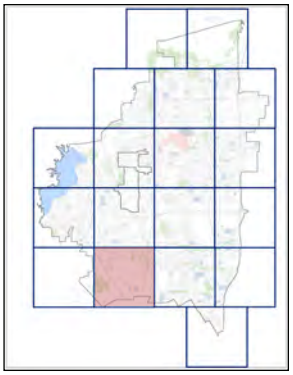


0 0.25 0.5 1 Miles

Hike Tile 15



Legend

- Intersection Improvements
- Shopping Centers
- Recommended Sidewalk Network
- Existing Sidewalks
- Streams
- Railroad
- Recommended Trails
- Recommended Sidepaths
- Existing Trails
- Existing Sidepaths
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- UT-Arlington
- Tarrant County College - SE Campus
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- Parks
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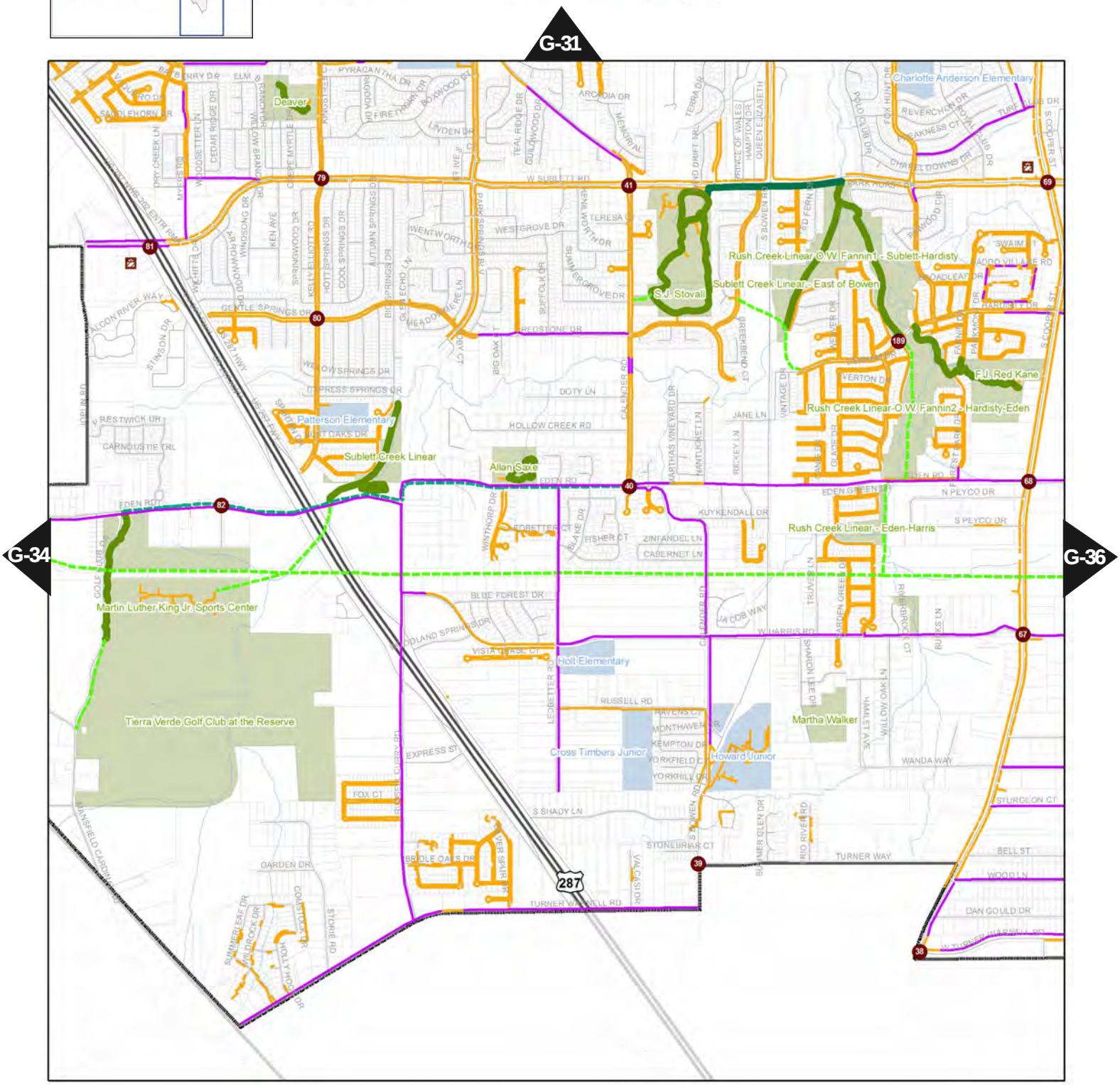
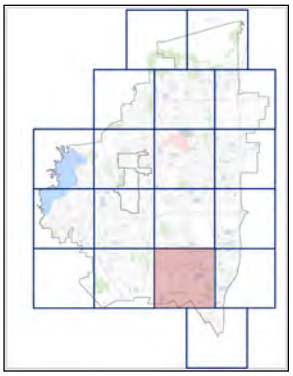
- Parcels
- Arlington Municipal Boundary
- County Boundary



0 0.25 0.5 1 Miles

Hike Tile 16



Legend

- Intersection Improvements
- Shopping Centers
- Recommended Sidewalk Network
- Existing Sidewalks
- Streams
- Railroad
- Recommended Trails
- Recommended Sidepaths
- Existing Trails
- Existing Sidepaths
- Highways
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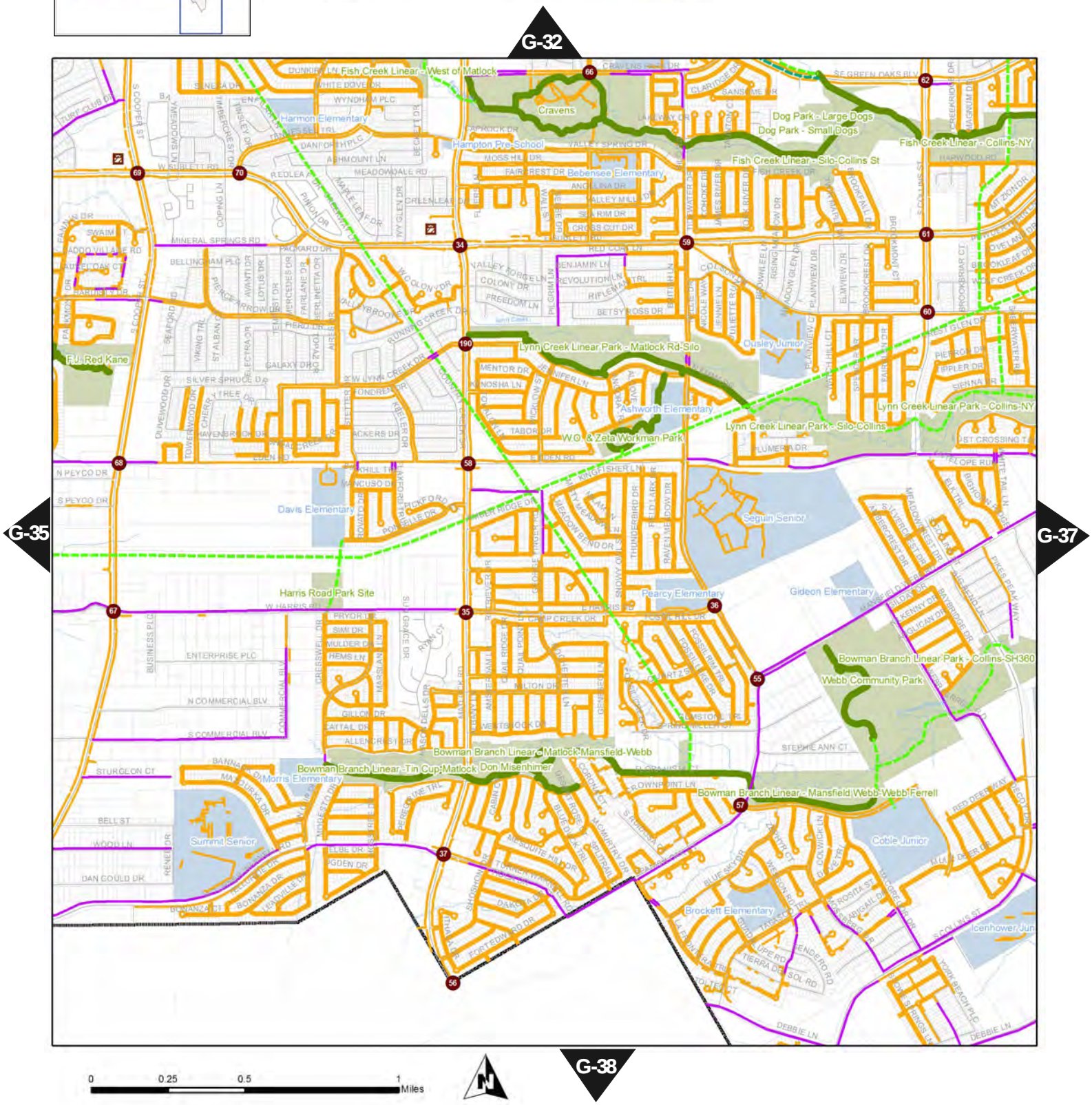
- County Boundary



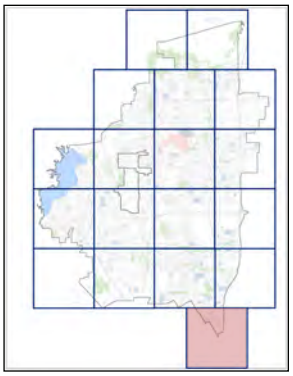
0 0.25 0.5 1 Miles

Hike Tile 17

Legend

- Intersection Improvements
- Shopping Centers
- Recommended Sidewalk Network
- Existing Sidewalks
- Streams
- Railroad
- Recommended Trails
- Recommended Sidepaths
- Existing Trails
- Existing Sidepaths
- Highways
- Streets
- Downtown Business District
- UT-Arlington
- Tarrant County College - SE Campus
- Schools
- Parks
- Lake
- Parcels
- Arlington Municipal Boundary
- County Boundary

Hike Tile 18



Legend

- Intersection Improvements
- Shopping Centers
- Recommended Sidewalk Network
- Existing Sidewalks
- Streams
- Railroad
- Recommended Trails
- Recommended Sidepaths
- Existing Trails
- Existing Sidepaths
- Highways
- Streets
- Downtown Business District
- UT-Arlington
- Tarrant County College - SE Campus
- Schools
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0 0.25 0.5 1 Miles