Imagine . . . .

We invite you into the Oklahoma City time machine. Picture yourself in the Oklahoma City Metroplex on January 1, 2000, the first day of the new millennium. It's 10:00 AM on one of those grand and glorious sunny, Spring-like Winter days in Oklahoma City. The Metroplex is on holiday and running on adrenaline from the New Year's Eve celebrations the night before. So what now?

Well, in 1997, the City Council of Oklahoma City said "yes" when citizens said we want a Beautiful City, a Healthy City, a Friendly City known for its Community Spirit. The City Council said "yes" to a system of trails throughout Oklahoma City that would bring almost every person in the community within 2.5 miles of the finest citizen-directed trails project in the United States. So, when Oklahoma Cityans woke up on that gorgeous day, January 1st of the new millennium, they headed for "The Trails."

In the year 2000, The Trails around Lake Hefner encircle our magnificent reservoir, with sailboats sailing and restaurants full of activity. Adventuresome bicyclists, skaters and wheelchair trailriders glide up and down the trail, along the canal that connects Lakes Overholser and Hefner. Others walk their baby buggies and stroll with grandparents around The Trails by the Zoo lake, Remington Park, the Omniplex, and the State Capitol. Tourists unload their bikes and slip on their tennis shoes for a pedestrian cruise on The Trails around Downtown to view the Memorial, the new Baseball Stadium, and to taste the fare in Bricktown. Others continue along the Bricktown Canal and enjoy the South Grand Boulevard loop which connects to The Trails along the Canadian River, while still others head for Lake Draper or Earlywine Park. Truly, there are many choices for all residents this first day of January, 2000.

The City, North, South, East and West is connected, not only by roads, but by trails -- it is a community of the new millennium. The City is not only bicycle-pedestrian friendly, it's people are very friendly as well. Oklahoma City is a destination for people from all over the World, for students and children, for seniors and for those just passing through. Our community is a World-Class City. But even if you are just passing through, the trees and flowers and welcome signs say that Oklahoma City is a place to stop and stay awhile.

The concept of constructing a network of multi-use trails throughout Oklahoma City is an ambitious one. Yet this same ambition, combined with community effort and perserverence, has been the driving force that has steered this area since before the Land Run in 1889. For instance, cattle drivers first saw this area from the Abilene and Chisholm Trails around 1870. Early settlers worked together for a common good in rebuilding a neighbor's barn after a storm. Similar involvement and mutual support from citizens today will enable our community to build a network of trails that will benefit both present and future generations.

In this manner, the Oklahoma City Trails Plan offers an opportunity to establish a permanent legacy that will ensure the quality of life for local residents for years to come. The future is ours today. Support "The Trails."

The Oklahoma City Trails Master Plan Steering Committee
May 1997

Oklahoma City
Trails Master Plan

Executive Summary

Introduction/Overview

The Oklahoma City Trails Master Plan offers recommendations for improving access to outdoor resources, close to where residents live and work, by building a network of off-road multi-purpose paved trails. The purpose of this Master Plan is to address the trail needs of community residents, related to recreation, transportation, economic and educational pursuits, to the year 2020. This Plan addresses policies, programs and physical improvements that should be implemented to improve access to recreation resources and improve transportation efficiency throughout the community. The plan identifies 28 corridors throughout the city that should be developed in the next 25 years. This Plan was developed by a Mayor's appointed citizens advisory committee, in conjunction with a consultant and with residents of the city. This Plan responds to specific needs that were defined by residents through a series of public workshops. The executive summary describes the process that was used to prepare this Plan, as well as the major findings and recommendations of the Plan.

How This Plan Was Developed

In May 1996, the Mayor of Oklahoma City commissioned a Trails Steering Committee, chaired by Dick Coyle, a well-known local businessman and avid outdoorsman, to prepare a trails master plan for the community. The Oklahoma City Planning Department served as technical staff and coordinator of the project.

Figure A: Dick Coyle, Chair of the Mayor's Trails Committee, leads workshop participants through final Master Plan recommendations.

In August 1996, the consulting team of *LandPlan Consultants, Inc.*, of Tulsa, Oklahoma, *Greenways Incorporated*, of Cary, North Carolina, and *FHC, Inc*. of Oklahoma City, Oklahoma, began working with the Steering Committee to prepare this Plan. The work of the consultant was funded through an Intermodal Surface Transportation Efficiency Act grant that was obtained by the City of Oklahoma City Planning Department from the Oklahoma Department of Transportation. The consultant team began its work with an extensive field analysis and evaluation of existing physical features, economic factors and social issues that served to define both opportunities and constraints for trail development through-

out the city. Of special interest to the consultant were the number of "attractors" or destinations that could be accessed and served through trail facility development. The consultant closely examined a variety of corridors of land that extend throughout the city including roadway corridors, abandoned railroads, electrical transmission lines, streams and rivers.

Involving Residents of the City

The consultant worked very closely with the Trails Steering Committee during the past seven months in preparing this Plan. The consultant has also conducted several public workshops, public meetings and made formal presentations of the plan to interested groups.

In June 1996, the consultant conducted the first of three sets of public workshops to invite the public to participate in the planning process. In June, residents defined appropriate goals, objectives and policies for improving access to outdoor resources throughout the city. Participants were asked to describe issues and concerns related to trail development; and they filled out opinion surveys that defined their individual needs for trails. Participants were also provided with an opportunity to define, on maps of the city, specific areas where they currently walk, ride a bike, hike, and rollerblade, as well as areas where they would like to see trail improvements made. The results of these workshops were summarized in a series of reports, termed "Technical Memorandums," and provided to staff at the Planning Department for review and comment. Results were also described in a series of newsletters that were published by the consultant and widely distributed throughout the city.

In October 1996, a second set of public workshops were conducted by the consultant to present the results of the June meetings. The consultant also presented an emerging network of corridors of land that would serve as the basis for a community-wide trails system. Workshop participants were asked to comment on the results of the prior meetings and carefully critique the initial network of trail corridors. The results of these workshops were summarized in a report and a newsletter published by the consultant.

The consultant also conducted a special meeting with the Oklahoma City Chamber of Commerce to present the overall concept of trail development for recreation, transportation, education and economic concerns. It is accurate to state that the concept was received with enthusiasm, and members of the Chamber asked how they might become involved in implementing the recommendations of the plan.

Defining a System of Trails for Oklahoma City

Using the information gathered during the public workshops, the consultant worked for four months to define a comprehensive community-wide system of trail corridors that would support a variety of trail uses, and meet the needs that were described by residents. A draft of this Proposed Trail System Plan was presented in November 1996 to the citizens advisory committee for initial review and comment. Drafts of the plan

were also reviewed by the Planning Department staff, as were five technical memorandums produced by the consultant. From the comments received, the consultant revised aspects of the initial draft Trails System Plan, and produced a final implementation plan and this executive summary. The Final Master Plan was presented to the Mayor's Steering Committee on February 11, 1997, where it was approved unanimously.

Key Components of this Plan

The technical memorandums produced by the consultant during the past seven months make up the six chapters of this Plan. Chapter One, Evaluation of Existing Conditions, defines the background data collected by the consultant. Chapter Two, Vision, Goals and Objectives, reflects the input of city residents and establishes the basis for many of the recommendations provided within the Plan. Chapter Three, Facility Design Guidelines, offers development criteria for building various types of trail facilities recommended throughout the Plan. Chapter Four, Description of Proposed Trail System, describes the corridors that make up the Oklahoma Metropolitan Trails System. Chapter Five, Funding Resources, describes a variety of local, state and federal sources of funding for developing bicycle and pedestrian facilities. Chapter Six, Implementation Plan, recommends how the Metro Trails System should be developed during the next twenty five years.

Key Recommendations of the Plan

This Plan recommends the implementation of a 208 mile network of off-road multi-purpose trails throughout Oklahoma City. The system is extensive and comprehensive, and at the same time provides a realistic program for satisfying the needs of local residents regarding access to outdoor resources and linkage to popular destinations. Building the system will take many years. The overall system is divided into two major phases. During an early action phase, it is envisioned that local government agencies will work in partnership with neighborhoods and private sector organizations to develop an estimated 104-miles of off-road trail corridors. Early action projects would begin development in Fiscal Year 1997. The remaining 104 miles would be developed by the year 2020.

Figure B: Chuck Flink and Keith Franklin explain the consultants' key recommendations at the final Master Plan public workshop.

The majority of the early action network is designed to form an inner loop of trails through some of the most densely populated areas of the community, linking residents to existing resources that are in close proximity to where they live and work. This will create a critical mass of trail facilities that will offer the city many of the benefits that have been outlined in the plan. Among these benefits are: improve access to outdoor

resources for recreation; linking local schools to residential neighborhoods providing children with the opportunity to walk or bike to school; and capitalizing on tourism and economic development opportunities.

This Plan also recommends that trail safety and education programs be promoted so that the emerging system will be recognized by local residents and used in the safest possible manner. These education programs range from safety classes taught by the Oklahoma Police Department to trail guides for local lakes and stream corridors.

How Much Will It Cost to Develop the Trails System?

A detailed cost estimate for the development of each corridor is provided in Chapter Six. Early action projects that warrant further study are estimated to cost somewhere between $18 and $23 million to fully develop. While this represents a significant range for cost estimating purposes, it is the best estimate that can be offered at this time, given the level of information that is available for each project corridor. More detailed cost estimates would be completed after a detailed corridor alignment/design development study is completed for each project.

Who Will Pay for the Development of the Trails System?

Some of the projects included in the early action phase are already funded. These projects include the Lake Hefner Trails, the North Canadian River trails, South Grand Boulevard trail, and the Bricktown Canal trail. Funding for these trail segments accounts for almost 1/4 of the total funds needed to develop all early phase projects. The remainder of early action projects are recommended to be funded through public-private partnerships. Local government money should be used to leverage money from state and Federal sources, as well as from private sector sources. Lake Hefner Trails is an example, more than $75,000 in private contributions helped leverage public funds to build the trails. Chapter Five in this Plan lists sources of funding that have been used locally, throughout the State of Oklahoma, and nationally, to build and maintain trail corridor projects.

What's the Next Step in the Process?

This Plan will be reviewed and approved by the Oklahoma City Planning Commission and City Council. Once it becomes an official component of the City's Comprehensive Plan, the projects that are defined herein will be eligible for development. The Planning Department encourages other private businesses and industry, local advocates and residents to become partners in the development of the Metro Trails System.

Specifically, fifteen (15) projects have been identified within this Plan for development in the early action phase. They include: the Lake Hefner Trails, South Grand Boulevard Trail, North Canadian River Central Greenway, Lake Overholser Trails,

Nichols Hills Trail, Deep Fork Greenway, West I-44 Trail, Bricktown Canal Trail, Draper Lake Trail, Earlywine Trail, Lightning Creek Trail, Tinker/Draper Lake Trail, Lincoln/ Robinson Link, Nichols Hills Trail, and the KATY rail-trail. Each of these projects will require a more detailed corridor alignment/design development study to determine the availability of land, location of trail facilities, and the public and financial resources that are available to support project development. These functional plan studies can and should begin right away, beginning in 1997 with the highest priority project corridor.

The design guidelines that are featured in Chapter Three define the type of facility improvements that are necessary in order to develop first class, high quality projects. These guidelines will serve to guide physical project development into the 21st Century for the entire 208 mile Metro Trails System.

Additionally, it is also recommended that the City of Oklahoma City develop a master plan for a network of on-road bicycle and pedestrian facilities. This will include making improvements to local streets and roads to accommodate cyclists, and improvements to the network of sidewalks so that pedestrians will have a place to walk.

You can show your support for the recommendations of this Plan by attending meetings of neighborhood, your area, and the City Council. You can also agree to become a partner in the development of each project that has been defined within this Plan, and encourage cycling clubs, running clubs and other trail user groups to do the same.

Figures C & D: Consultants Chuck Flink and Keith Franklin discuss details of the Trails Master Plan with local residents at the Final Master Plan Workshop, while above: Hal McKnight briefs a local television station on the Metro Trails Master Plan Map

Chapter One
Evaluation of Existing Conditions

1.0 Overview

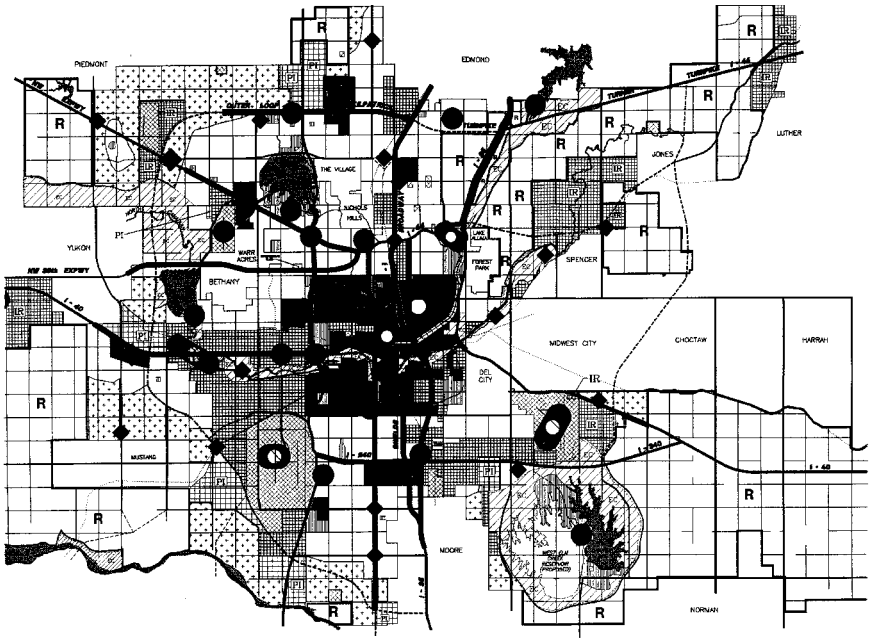
The Oklahoma City Trails Master Plan is a nine-month planning effort that is a result of public interest and support, and the initiative of a mayor-appointed citizens committee. The purpose of this plan is to address the development of a system of multi-use trails, including sidewalks, to meet the recreation, transportation and economic needs of local residents into the year 2020. These trails would not be on roads, but could traverse parks, wide rights-of-way, railroad corridors, wide medians, old trolley routes, stream corridors, and public lands. Sidewalks and on-road segments may be necessary in some areas to link trail segments.

Photo of Oklahoma City (courtesy of Urban Land Institute)

The Master Plan will address policies, programs and physical improvements that are necessary to develop a trail system throughout Oklahoma City. It identifies strategies that will increase transportation choice, mobility, access to outdoor resources and linkage to popular destinations. These objectives are consistent with local, state and federal goals for improving conditions for bicycling and walking as both viable forms of alternative transportation and important recreational activities. Additional trail user groups include runners, wheel chair users, in-line skaters, mountain bike enthusiasts and others.

The Oklahoma City Trails Master Plan will stress the transportation, health, recreation, economic and educational benefits offered by trails, and will define air quality and traffic congestion improvements that can result from increasing non-motorized trips. Providing local residents greater choice and more opportunities to bicycle and walk will serve to encourage a cleaner, greener, safer and healthier community. This in turn will improve the quality of life throughout the city, maintaining the area as a desirable place to live and work. Achieving these goals will continue to make Oklahoma City an attractive community for economic growth and business development into the 21st Century.

This document is the first in a series of Technical Reports that serve to define existing corridors and attractors for off-road trail development; goals and objectives for a regional trail system; appropriate future trail facilities for Oklahoma City; design guidelines for such facilities; a funding strategy and financial resources to support the development, operation and maintenance of trail facilities; and a final master plan that includes an implementation plan or "Action Plan" for strategic and prioritized development of the trail system.



Map of Oklahoma City

1.1 Benefits of Off-Road Trails

Investment in a trail system pays off, directly and indirectly, thorough a variety of benefits realized by communities.

Transportation benefits: Trails can link common destinations such as schools, commercial and employment centers, parks and libraries. Therefore, they can provide alternative transportation routes which reduce or prevent congestion on highways and streets and the associated costs of expanding or developing infrastructure for motor vehicles.

Health and Recreation benefits: Trail systems often link existing parks and playgrounds and provide a variety of opportunities for recreation and exercise to many, regardless of age and ability. Typically, they are used by walkers, joggers, and bicyclists and, based on terrain and trail design, the intensity of exercise can range from mild to strenuous. Excepting extremely rough terrain, trails can and should be designed to be accessible to those with physical limitations.

Economic benefits: In exchange for the costs of development and maintenance, trail systems frequently produce a diversity of economic benefits including increased tourism and recreation-related revenues, increased property values for homes and businesses located adjacent to trails, and avoided costs for highway expansion. Trail systems are also a quality-of-life amenity considered important by many corporations seeking to expand or relocate.

Air quality benefits: Trails promote walking and bicycling and often link shopping and employment districts, schools, parks and libraries. Therefore, they provide alternatives to motor vehicle transportation which can figure significantly in controlling or reducing air-polluting emissions.

Education benefits: Trails provide opportunities for learning about the cultural and natural resources within a community. Interpretive displays and outdoor classrooms along trails provide information to people of all ages on such

topics as hydrology, history, ecology and the use of recycled materials. Signage on trails along the routes of the historic Abilene and Chisholm Trails, for example, could provide insights about the Crosstimbers, the advantages of drainage basin ridge lines, and the benefits of designing with nature.

Quality of life benefits: Communities with trail facilities and high levels of walking and bicycling are among the best places to live in America. Residents enjoy an increased quality of life defined by a greener, safer and more interactive community.

1.2 Description of the Study Area

Oklahoma City is a expansive urban community located in the heart of the "Old West", rich in history and culture. Native Americans were the first people to live in the area, taking advantage of its abundant natural resources. Then, in the 1850's, a small group of frontier settlers arrived and began to build a trading post on the North Canadian River. Trails were prominent in the early history of the area, since more than 30 miles of the Chisholm and Abilene Trails brought thousands through the area between 1866 and the 1889 land run.

The North Canadian River

Since 1889, Oklahoma City has expanded enormously and currently extends outward from the downtown area for approximately 650 square miles. Due to its size, Oklahoma City is able to exhibit all the attractiveness of a big city in the downtown area, while its edges provide plenty of undeveloped prairie, woodland, and farmland over flat to gently rolling terrain.

The city's most significant natural features are its rivers and man-made lakes, complemented by the hot, dry summer climate of the region. The western side of the City tends to be grassy prairies, while the eastern side straddles the hilly crosstimbers. Lake Stanley Draper, Lake Overholser, Lake Arcadia, and Lake Hefner are popular recreation destinations on the outskirts of the city that offer opportunities for hiking, biking, picnicking, boating, and fishing. The North Canadian River flows through the heart of the city, and is planned to undergo redevelopment that will enhance the resource and highlight the river as a community centerpiece.

View of downtown Oklahoma City

Oklahoma City is the 29th largest city in the country, with a metropolitan population of over one million. Approximately 468,000 people reside within the city limits, and the population is expected to grow to 490,000 by the year 2000. Despite its unique character, population growth now and over the past 25 years has resulted in development patterns that are typical of other fast growing cities. The outskirts of Oklahoma City are beginning to look like typical suburban America. Strip shopping malls, fast food restaurants and competing retail

chains are sprouting. Farmland and prairie in the north, west, and south have been sold to make room for residential suburbs and shopping malls. While economic growth is an absolute necessity for progressive communities, rapid suburban growth can become more of a detriment than an improvement to living conditions. The growth that Oklahoma City has experienced over the past 25 years has transformed the community from an economy based on agriculture and fossil fuels to a tourism, retail and industrial economy. It has also transformed local towns on the outskirts of the city from sleepy crossroads into bustling suburban activity centers.

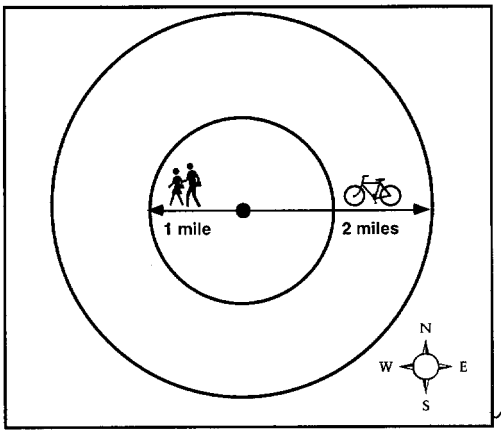
Along with this growth has come more dependence on the automobile for primary and secondary transportation. From the standpoint of bicycling and walking, suburban growth has served to limit opportunities for choosing a mode of transportation other than the automobile. This lack of choice is manifested in longer distances between home, work, school, shopping, recreation and entertainment; a lack of facilities that support alternative modes of transportation; and new barriers to walking and bicycling such as wide arterial roadways. With more trips requiring the use of the automobile, it is not unusual to experience more congestion on local roadways, especially during peak travel times. This phenomenon in Oklahoma City will only continue to worsen if suburban growth patterns and transportation are not considered comprehensively.

Nationally, non-motorized transportation planning is becoming a realistic and popular method for examining recreation and transportation problems, solutions and priorities. The principal focuses of trail planning are access to outdoor resources, linkage and mobility. With rapid growth in population, many communities are losing precious open space and the rural character that served to define the local lifestyle. Trail master plans typically examine ways to preserve corridors of land that provide people with access to outdoor resources that are close to where people live and work. They also serve to link people to the important remaining community open space resources, such as parks, nature preserves and other cultural destinations. As an element of recreation, trail corridors enable local residents to refresh and renew the human spirit.

While most Americans have typically viewed bicycling as a recreational pursuit, it is gaining acceptance as a legitimate form of transportation within progressive communities throughout the nation. Walking, sometimes viewed as an inefficient form of transportation, is also gaining more acceptance as a method for maintaining a healthy lifestyle and an escape from congested automobile corridors. Under the right set of circumstances, bicycling and walking can offer the same efficiency as automobile transportation. Surprisingly, bicycle and pedestrian planning reveals that American communities in their present form can be easily and cost effectively retrofitted to take advantage of these efficiencies.

1.3 Overview of Existing Attractors

In order to fully appreciate the opportunity that trail facilities offer the population of Oklahoma City, the consulting team has compiled a listing of public and private facilities and destinations that are most likely to attract persons who might choose to walk or ride a bicycle to complete an activity (also known as a "trip"). These attractors are divided into several subcategories.



Typical commuting distances for bicyclists and pedestrians

It should be noted that the most commonly accepted range for a walkable trip is between one-half mile to two miles, with the most popular being one mile. A 1 mile walk for the average person takes about 15 to 20 minutes over flat to gentle terrain. The most commonly accepted range for a bicycle trip is between 1 mile and 5 miles, although many advanced cyclists will easily ride more than 20 miles on the average. The most popular bicycling distance is two miles. A 2-mile bike ride for the average person can be accomplished in 10 minutes over flat to gentle terrain.

Although Oklahoma City is an expansive urban area, many of the trips made by individuals occur within their section of the city. A majority of trip destinations, or attractors, are within walking and bicycling range-five miles or less-for local residents. Therefore, for the purposes of this analysis of existing conditions, Oklahoma City was divided into five sections. They are Northwest, Northeast, Southeast, Southwest and Downtown. The existing conditions of each section are discussed in this report.

1.3.1 Northwest Oklahoma City

Northwest Oklahoma City includes the area west of Santa Fe Avenue and north of Reno Avenue, excluding the downtown area. Although they lie within the geographical borders of this area, the Warr Acres, Nichols Hills, Yukon, The Village and Bethany municipalities are not part of Oklahoma City and are therefore not included in this inventory and analysis. Waterways, including Lakes Hefner and Overholser, serve as the major landscape features and attractions in Northwest Oklahoma City. Trail facilities are abundant in some parkland areas, such as Dolese Youth Park, but bicycle and pedestrian linkages to local destinations are lacking.

Lake Hefner serves as a primary recreational destination for the residents of Oklahoma City and the surrounding area. Although swimming is prohibited, sailing, fishing and birdwatching are popular activities. Hefner Trails are popular and enjoyed by bicyclists, walkers, joggers and rollerbladers. Additional trails are planned. There is also a bicycle lane on Lakeshore Drive along the dam which provides a spectacular view of the lake and surrounding community. Pedestrian and bicycle access from surrounding neighborhoods is limited, especially in the north where steep dam walls isolate the lake shore from surrounding communities.

Lake Overholser

Lake Overholser is a companion recreation area that lies a few miles to the southwest of Lake Hefner. Swimming is also prohibited here, with boating, fishing and picnicking being the most enjoyed activities. Visitors enjoy the non-motorized trails on the southeast side of the lake, but there are no plans currently underway to build more trails. Bicycle and pedestrian access around the lake and to the lake is limited, encouraging most visitors to arrive by automobile. The lake is separated from the river channel by a narrow isthmus which has a length of almost two miles. The isthmus is a unique trail opportunity.

Stinchcomb Wildlife Refuge is located to the north of Lake Overholser along the North Canadian River, and is another major attraction. Currently, the only access to the refuge is on roads that are not intended for bicycle and pedestrian traffic. Of course, any facility allowing access into the refuge will be constructed so as to minimize impacts on the natural resources. An excellent opportunity for trail development exists along the North Canadian River, creating an off-road linkage between the Lake Overholser recreation area and the Stinchcomb Wildlife Refuge.

A water diversion canal links the two Oklahoma City lakes mentioned above. Although a short section of the canal is underground, at least part of the above-ground portion has the potential to become a bicycle and pedestrian facility that would provide an off-road linkage between the two recreation areas. Various safety, maintenance, and water quality issues, however, must be addressed if any segment of the canal is to be flanked by a trail.

Drainage canal between Lake Hefner and Lake Overholser

Urban Activity Corridors are prominent in Northwest Oklahoma City. These corridors provide the traveler with an array of strip shopping centers, fast food restaurants, retail centers and strip business centers. These landscapes are not conducive to bicycling or walking due to the high speed, heavy traffic, lack of sidewalks, and substantial noise and wind drafts that are associated with them. However, as major thoroughfares, they represent the primary corridors for accessing the goods and services that residents and tourists desire. Off-road bicycle and pedestrian facilities could provide a safer alternative mode of transportation adjacent to these roadways, as could the use of local streets and other back streets. The urban activity corridors evaluated in Northwest Oklahoma City include:

May Avenue from NW 10th to Memorial Road
MacArthur Boulevard from Reno Avenue to NW 39th
Classen Boulevard from I-40 North to Wilshire Road
North 23rd Street from I-235 (Centennial Expressway) west to I-44
Northwest Expressway from Classen Boulevard to County Line Road
NW 39th Street from I-44 to Mac Arthur Boulevard

View along a typical activity corridor

Residential Neighborhoods provide varying degrees of access and continuity for bicycle and pedestrian travel. Some of the most friendly neighborhoods for bicyclists and pedestrians include older residential areas and historic districts. Some neighborhoods, such as Warwick, already feature trails. The newer neighborhoods in Northwest Oklahoma City often provide no sidewalks for pedestrians and little consideration for novice or child cyclists. The development of trail facilities and sidewalks could provide better non-motorized access to, and safer travel within, these residential neighborhoods.

Community and Neighborhood Parks are primary destinations for local residents in Northwest Oklahoma City. Generally, off-road trail access to these parks is limited. For example, Dolese Youth Park is a large recreation facility that includes a bicycle and pedestrian trail, but, stairs act as a barrier to those living in certain bordering neighborhoods who wish to have bicycle and stroller access. Martin Park and Memorial Park also contain trails. The community and neighborhood parks in the study area are listed below.

Alice Harn Park
J.B. Black Park
Campbell Park
Crown Heights Park
Dolese Youth Park
Dulaney Park
Florence Park
Geraldine Park
Goodholm Park
Guilchester Park
Hefner Park
E.B. Jeffrey Park
Macklanburg Park
Martin Nature Center
Mayview Park
Meadowbrook Park
Memorial Park
North Britton Park
O'Neil Park
Perle Mesta Park
Quail Creek Park
Reynolds Field
Ross Park
Smitty's Park
Stars & Stripes Park
Tinsley Park
Will Rogers Park
Winans Park
Andrews Park
Britton Park
Corbin Park
Denniston Park
Douglas Park
Edgemere Park
Flower Garden Park
Girvin Park
Grove Park
Harvest Hills Park
Highley Park
Lake Shore Estates Park
Mark Twain Park
Mayfair Park
McKinley Park
Melrose Park
Military Park
North Rotary Park
Pat Murphy Park
Pied Piper Park
Redlands Park
Rockwell Park
Saint Clair Park
Sparrow Park
Swatek Park
Topping Park
Lytle Park
Woodrun Park

Other Public Facilities and Special Use Areas in Northwest Oklahoma City include the All Sports Baseball Park, Taft Stadium, Wiley Post Airport, the State Fair Grounds, Belle Isle Library, and Drexel Library. Some of these areas are seasonal destinations for tourists and local residents alike. Equestrian activity is

common within the Oklahoma State Fair Grounds and off-road equestrian trails could provide linkages to the North Canadian River. If facilities such as sidewalks and trails were provided, more visitors would arrive by horse, bike or on foot.

Equestrian at the State Fair Grounds

An historic public facility is the former Route 66 Bridge that crosses the North Canadian River at the northern end of Lake Overholser. It was temporarily closed to automobile traffic in 1996 but was informally used by bicyclists and pedestrians. This historic facility could be preserved and enhanced to function as a permanent bicycle and pedestrian bridge.

Bicyclist on the former Route 66 bridge

Schools, Colleges, and Vocational Schools are primary destinations for thousands of Northwest Oklahoma City residents. Bicycle and pedestrian travel to school sites is limited due to the lack of sidewalks and other off-road trail facilities. Some colleges, such as Oklahoma City University and the local campus of Oklahoma State University, offer bicycle and pedestrian facilities on campus but linkage to surrounding areas is limited. The schools, colleges and vocational schools included in the Northwest Oklahoma City study area are listed below.

Bishop McGuinness High
Buchanan School
Charles Haskell Elementary
Classen Senior High
Council Grove School
Edgemere School
Gatewood School
Harding Junior High
Hawthorne School
Heritage Hall
Horace Mann School
John Marshall Senior High
Kirkland Elementary
Madison School
Britton Elementary
Central Junior High
Classen 5th Grade Center
Coronado Heights School
James L. Dennis Elementary
Eugene Field School
Greenvale School
Harvest Hills Elementary
Hefner Junior High
Hoover Junior High
John Carroll School
Kaiser School
Linwood Elementary
Mark Twain School

Monroe School
Northridge Elementary
Putnam City West Senior High
Putnam City North High
Quail Creek Elementary
Ralph Downes School
Rosary School
Stonegate School
Surrey Hills Elementary
Tulakes School
Washington Irving Elementary
Westminster School
Wiley Post Elementary
Will Rogers Elementary
Wilson School
Windsor Hills School
Belle Isle Vocational Technical School
Oklahoma Southwest College
Oklahoma City University
Okla. St. Univ. Tech. Institute
F. Tuttle Vocational Technical School

Nichols Hills Elementary
Northwest Classen High
Putnam City High
Putnam Heights Elementary
Villa Teresa School
Rollingwood School
Sequoyah School
Summit Middle
Taft Junior High

Expansive parking lots can intimidate pedestrians and bicyclists

Shopping Centers throughout Northwest Oklahoma City are generally automobile-oriented, with few facilities for non-motorized travelers. These centers are dominated by large parking lots, with little or no designated space for walkers, and no places to store a bike while shopping. Many customers would choose to bicycle or walk to these shopping centers if facilities were provided for them. The shopping centers in Northwest Oklahoma City are listed below.

Amherst Square Shopping Center
Ann Arbor Terrace Shopping Center
Brixton Square
Council Crossing Shopping Center
French Market Mall
Grandview Shopping Center
Lakeshore Mall
Lakeside Shopping Center
Lido Center
Penn Square Mall
Fifty Penn Place
Coronado Square Shopping Center
Courtyard Plaza Shopping Center
Grand Plaza Shopping Center
Hoover Plaza Shopping Center
Lakeshore Shopping Center
Lakewood Shopping Center
MacArthur Park Shopping Center

Mayfair Shopping Center
North Park Mall
Penn Crossing Shopping Center
Peppertree Square
Portland Plaza Shopping Center
Quail Plaza Shopping Center
Quail Point Shopping Center
Quail Springs Mall
Rockwell NW Shopping Center
Rockwell Plaza Shopping Center
Shartel Plaza Shopping Center
Shepherd Mall
Spring Creek North Shopping Center
Springbrook Plaza Shopping Center
Springbrook Shopping Center
Springdale Shopping Center
Town & Country Village Center
West Oaks Village Shopping Center
Wilshire Village Shopping Center
Windsor Hills Shopping Center
NW Plaza Shopping Center Outlet Mall

Hospitals and Medical Centers in Northwest Oklahoma City provide little accommodation for bicyclists and pedestrians. Medical workers and patients would benefit from the development of off-road facilities that would offer an alternative mode of transportation for bicyclists and pedestrians. The hospitals and medical centers included in the study area are:

Baptist Medical Center
Deaconess Hospital
Doctors General Hospital
Healthsouth Rehabilitation Hospitol
Mercy Health Center
Saint Anthony Hospital
Vencor Hospital

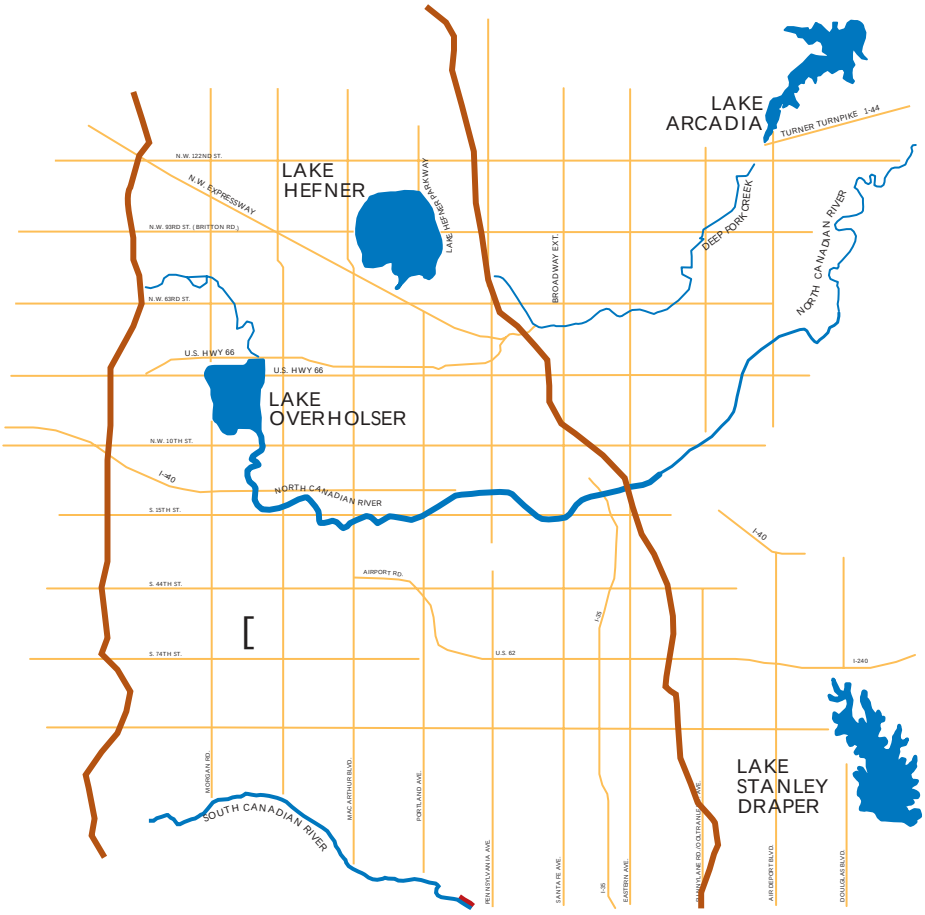
Major Employers in Northwest Oklahoma City have made some limited concessions to bicycle and pedestrian travelers, yet the majority do not provide access to their facilities for bicyclists and pedestrians. Some employers in other states provide bicycle parking, shower facilities, walking and fitness programs, as well as financial incentives that serve to encourage bicycle and pedestrian commuting. Employers would certainly benefit from a more alert and healthy work force, and similar programs could be initiated along with the development of off-road facilities that connect these workplaces to residential areas. Several major employment nodes exists in Northwest Oklahoma City. They are near: NW 23rd and Classen, NW Expressway and Penn, NW Expressway and S.H. 74 (Hefner Parkway), Memorial and Portland, Reno and Council, and Broadway Extension at NW 63rd. The major employers included in the study area are:

AMRIS Teleservice Resources
Alliance Real Estate
American Floral Services
Baptist Hospital
Blue Cross & Blue Shield of Ok.
Bluelincs HMO

Boyd Chevrolet
CMI Corporation
AT & T Wireless
Central Oklahoma Medical Group
Community Bank & Trust Co.
Jackie Cooper Enterprises
Cox Cable Oklahoma City, Inc.
Deaconess Hospital
Doctors General Hospital
Donco Carriers, Inc.
Louis Dreyfus Natural Gas Corp.
Eateries, Inc.
Joe Esco Tire Co.
Feed the Children
Fiserv
Four Seasons Nursing Center
Great Plains Coca-Cola Bottling Co.
Gulfstream Aerospace Technologies
Haskell Lemon Construction Co.
Hertz Reservation Center
Hospitality Franchise Systems
Johnnie's Charcoal Broiler
Little Giant Pump Co.
Love Box Co.
MRM Oklahoma Properties
Manhattan Construction Co.
Martinaire of Oklahoma
McBride Clinic
Mid-Continent Life Insurance
Bob Moore Cadillac
Oklahoma City University
Oklahoma Graphics
Oklahoma State University
Quail Springs Mall
Reynolds & Reynolds
Safety & Security Services
Seagate Technology, Inc.
John Smicklas Chevrolet
Sonat Exploration Co.
Staff One, Inc.
TVC Marketing Associates
Building Owners & Man. Ass.
Canterbury Retirement Comm.
Central Liquor Company
Coachmen Incorporated
Conoco, Inc.
Corken, Inc.
Darr Equipment Co.
Dealers Auto Auction of OKC
Dolese Bros. Co.
Doskocil/Wilson Foods Corp.
Lucent Technologies
Epworth Villa
FKW Inc.
Fife Corp.
Fleming Companies
Grace Petroleum Corp.
C. H. Guernsey & Co.
HTB, Inc.
Healthcor
Lynn Hickey Dodge
ITT Hartford
L & S Automotive Products
Local Federal Bank
Love's Country Stores
Mail-Well Envelope
Marriot Hotel
McAllister & Reed, Inc.
Mercy Health Center
The Midland Group
Norman Foods, Inc.
Oklahoma Kenworth
Oklahoma Health System
The Olive Garden Restaurant
Rainbo Baking Co.
Dub Richardson Ford
St. Anthony Hospital
Sears Roebuck & Co.
Smith & Nephew Dyonics Vid.
Stan. Life & Accident Ins.
State Fair of Oklahoma
Trison Properties Inc.

USF&G Insurance Co.
Waterford Hotel
Willow View Hospital
Penn Square Mall

United Engines
Wattie Wolfe Mech. Con.
Xerox Corp.



While the historic Abilene and Chisholm Trail corridors are no longer intact, they may provide opportunities for historic sites along the proposed trail system.

1.3.2 Northeast Oklahoma City

Northeast Oklahoma City includes the area east of Santa Fe Avenue and north of Reno Avenue, excluding the downtown area. Forest Park, Spencer, Edmond, Jones, Midwest City, Harrah, and Choctaw are neighboring municipalities that are not included as part of the study area. Much of Northeast Oklahoma City is rural, with the Deep Fork Creek and North Canadian River serving as primary landscape features. Trail facilities are limited throughout this area.

Deep Fork Creek

The Deep Fork Creek flows east through Northeast Oklahoma City to Lake Arcadia in Edmond. Unlike many rivers and streams in Oklahoma City, the Deep Fork Creek has not been channelized. Although Topping Park is located along the creek, and the Central Park Office Complex on Lincoln Boulevard has a short jogging trail along the creek, the majority of its banks are not easily accessible by the public. Currently, the creek corridor is not being utilized as a recreational resource, but has the potential to become a multi-purpose trail facility linking many areas within Northeast Oklahoma City.

The North Canadian River continues east through Northeast Oklahoma City from the downtown area. Sections of the river near the downtown area are channelized. This river corridor is not accessible by the public as a transportation or recreation resource and presents an excellent opportunity for trail development.

There are two **Urban Activity Corridors** in Northeast Oklahoma City. Lincoln Boulevard south of I-44 is similar to the corridors named in the Northwest in that it also presents dangerous conditions for bicyclists and pedestrians. NE 23rd Street from I-35 to Kelley Avenue is another commercial strip with a lack of facilities for bicyclists and pedestrians.

Residential Neighborhoods are less concentrated in Northeast Oklahoma City. Bicycle and pedestrian travel within these neighborhoods is limited. The neighboring municipalities of Edmond, Forest Park, Spencer, Jones, Midwest City and Choctaw contain residential areas as well as natural areas and a potential rail-to-trail project. Consequently, trail linkages to these areas should also be considered.

Community and Neighborhood Parks in Northeast Oklahoma City serve as destinations for local residents. Some of the parks listed below are medians or open space areas. Lincoln Park is an especially popular recreation center in Northeast Oklahoma City, located near many tourist attractions. Generally, off-road trail facilities within the parks are limited, as is bicycle and pedestrian access to the parks.

Burton Park
Culbertson Park
Diggs Park
Dolphin Wharton Park
Edwards Park
Harden Park
Harrison Park
John F. Kennedy Park
Lincoln Park
McNabb Park
Nichols Court Park
Northeast Center Park
Pitts Park
Rhode Island Park
Triangle Park
Woodland Park
Creston Hills Park
McGee Park
Douglass Park
Perry Park
Glen Ellyn Park
Harn Garden Park
Hiram Park
Lacy Park
McMechan Park
Minnis Lakeview Park
North Highland Park
Phillips Park
Progressive Community Park
Stiles Park
Washington Park

Schools and Colleges are destinations for many Northeast Oklahoma City residents as is Ralph Ellison Library. Bicycle and pedestrian travel to school sites is limited due to the lack of sidewalks and other off-road trail facilities. Colleges may offer bicycle and pedestrian facilities on campus but linkage to surrounding areas is limited due to their remote location.

Bryant Elementary
Creston Hills School
Douglass High
Edwards Elementary
F. D. Moon Middle
James E. Polk School
Longfellow School
Midwest Christian College
North Highland Elementary
Oakdale School
Oklahoma Christian School
Trinity School
Corpus Christi School
Dewey School
Dunbar School
Eisenhower School
Garden Oaks School
Martin Luther King Jr. Elementary
Metrotech Vocational Tech. School
Millwood School
Northeast High
Oklahoma Christian University
Univ. of Ok. Health Sciences Center
Oklahoma School of Science and Mathematics (high school)

Public Facilities and Special Use Areas in Northeast Oklahoma City are concentrated near the downtown area, the Capitol, and Lincoln Park. The National Cowboy Hall of Fame, Kirkpatrick Center Museum Complex, Lincoln Park Zoo and the Oklahoma Firefighters Museum also serve as major attractions. A sidewalk system connects the state government buildings, including the Governor's Mansion and State Capitol. However, bicycle and pedestrian access to all of these facilities is limited.

Pedestrian trail located near the State Capitol

Cameron Equestrian Center
Lincoln Park Zoo
National Softball Hall of Fame
State Capitol
State Historical Museum
Oklahoma Firefighters Museum
Frontier City Theme Park
Presbyterian Center for Healthy Living
Governor's Mansion
National Cowboy Hall of Fame
Ralph Ellison Library
Kirkpatrick Center Museum Complex
45th Infantry Division Museum
Remington Park Race Track
Two local YMCA's

Shopping Centers in Northeast Oklahoma City are few and bicycle and pedestrian access to them is limited. They are very similar to those described in the Northwest Oklahoma City section.

Eagle Crest Shopping Center
Pate Shopping Center
Santa Fe Plaza Shopping Center

Hospitals and Medical Centers in Northeast Oklahoma City are clustered near the Capitol.

Columbia Presbyterian Hospital
The University Hospitals
Veterans Administration Hospital

Major Employers in Northeast Oklahoma City are similar to those described in the Northwest section. Major employment nodes can be found near: NE 23rd and Lincoln, NE 10th and Lincoln, NE 36th and Sante Fe, Broadway Extension and Britton Road, and Memorial Road at Bryant. The major employers are listed on the following page..

American Deposit Insurance Co.
Arthur Andersen & Co.
Benham Group, Inc.
Bone & Joint Hospital
Bonray Drilling Corp.
Central Sales Promotions, Inc.
Cintas Corp.
City-County Health Dept. of OKC
Clements Food Company
Jackie Cooper Transport Co.
Wm. E. Davis & Sons, Inc.
Univ. of Ok. Health Sciences Center
EMSA
Farley Foods, USA
Fox Building Supply
C. L. Frates and Co.
Governair Corp.
High Pointe Psych. Treatment Center
Bob Howard Auto Mall
Hyde Drug Inc.
W. I. Jones & Co.
KFOR-TV Channel 4
KOCO-TV Channel 5
KWTV Channel 9
Kimray, Inc.
Kraft Foodservice
Langsam Health Services
Macklanburg Duncan
Marriot Management Services
McAfee & Taft
McKinney Stringer & Webster
Medical Arts Laboratory, Inc.
Millwood Public Schools
Montgomery Ward & Co.
National Check Cashers
New York Life Insurance
Oklahoma Allergy Clinic
Oklahoma Blood Institute
Oklahoma Christian University
Oklahoma City Clinic
Oklahoma City Zoo
Ok. Medical Research Foundation
Oklahoma Publishing Company
Orbit Finer Foods
Pepsi-Cola Co. of Oklahoma City
Phillips Petroleum Co.
Presbyterian Hospital
Price-Edwards-Henderson & Co.
Ralston Purina Co.
RedRock Mental Health Center
Remington Park
Reserve National Insurance Co.
Sam's Wholesale Warehouse
Security General Life
InsuranceShawver & Son Inc.
Southwestern Roofing & Metal Co.
State of Oklahoma
Travelers Motor Club, Inc.
United States Army RCTG
V. A. Medical Center
VES Enterprises
American Red Cross (Okla. County)
Okla. State Dept. of Health
Okla. State Dept. of Mental Health
Dean A. McGee Eye Institute
Urocor, Inc.
Office of the Chief Medical Examiner
University Hospital
Children's Hospital of Oklahoma
Carlisle Foodservice Products
Okla. School of Science & Mathematics

1.3.3 Southeast Oklahoma City

Southeast Oklahoma City includes the area east of Santa Fe Avenue and south of Reno Avenue, excluding the downtown area. Del City, Norman and Moore are municipalities that are not included as part of the area analyzed. Lake Stanley Draper is a major landscape feature, with abundant rural land to its east and Tinker Air Force Base, the General Motors Plant, industrial areas and limited residential areas to its north and west. Roads in rural areas are popular as on-road bicycle facilities due to their low traffic volume and wide shoulders. There are few off-road trail facilities throughout Southeast Oklahoma City with the exception of the motorized and mountain bike trail system in place at Lake Stanley Draper. The City of Del City also has a funded trail which will link a library to Reno through Ray Trent Park.

The North Canadian River continues east for a short distance through Southeast Oklahoma City near the downtown area. This section of the river is channelized and does not accommodate bicycle and pedestrian travel. A Native American Cultural Center has been proposed near the river and Eastern Avenue. The banks of the river in Southeast Oklahoma City, as in other sections of the city, present an excellent opportunity for trail development. Two miles of trail will be developed there as part of the MAPS project.

Entrance to Lake Stanley Draper

Lake Stanley Draper is a seasonal destination for many Oklahoma City residents. Although swimming is prohibited, boating, jet skiing, water skiing, fishing, horseback riding, and picnicking are popular activities. Bicycle and pedestrian facilities include an on-road bicycle route surrounding the lake and mountain bike trails.

Residential Neighborhoods within the boundaries of Southeast Oklahoma City are common. Off-road trail facilities within these neighborhoods are limited. The neighboring municipalities of Del City, Midwest City, and Moore contain residential areas and trail linkages to these areas should be considered. Each of these three communities have existing or planned trails which link to neighborhoods.

Schools in Southeast Oklahoma City are similar to the schools mentioned in previous sections with regard to bicycle and pedestrian access and facilities. There is a college just outside the City and one vocational technical school campus exists on South Bryant as well.

Barnes School
Central Oak Elementary
Crooked Oak Middle
Highland Park School
Parmelee School
Schwartz Elementary
Sooner Elementary
Tinker Elementary
West Oak Park School
Bodine School
Crooked Oak High
Hayes School
Parkview Elementary
Santa Fe Elementary
Shidler School
Southeast High
Webster Junior High
Wheeler School

Community and Neighborhood Parks are less prevalent in Southeast Oklahoma City than in other sections. Trosper Park is an especially popular public park and golf course in this area. The park features trails designed for archery and also has roads available to the Capitol Hill Riding Club, a local equestrian group. As with other sections, trail facilities within the parks are limited.

Trosper Park

Bob Akers Park
Crossroads Park
Draper Park
Frost Heights Park
Hathaway Park
Mackelman Park
McCracken Park
Schilling Park
Shallowbrook Park
Top-O-Town Park
Trosper Park

Other Public or Special Use Facilities in Southeast Oklahoma City include the Southeast Station Post Office and the Boys and Girls Club recreation and community center. This facility serves as a destination for many Oklahoma City residents and could be enhanced by the development of bicycle and pedestrian facilities.

Shopping Centers in Southeast Oklahoma City are few and bicycle and pedestrian access to them is limited. These facilities are very similar to those described in previous sections.

Crossroads Mall
Hartsdell Shopping Center
Southeast Plaza Shopping Center
Sunny Lane Plaza Shopping Center
Towne South Shopping Center

Major Employers in Southeast Oklahoma City are similar to those previously described in the Northwest section. Major employment nodes in this area are near: SE 29th and Douglas, I-240 and Air Depot, and I-240 and I-35.

API Enterprises, Inc.
Cato Oil and Grease
Cooper Oil Tool
Crossroads Mall
General Motors Corp.
Jordan-Delaurenti, Inc.
Oklahoma City Air Logistics Center
Pratt Foods, Inc.
Star Building Systems
Tinker Naval Air Station
Unit Parts Co.
Dana Chassis Products
WIX/ Dana Corporation
Coreslab Structures
Flintco, Inc.
Hudiburg Nissan
KF Industries
Oklahoma Tank Lines, Inc.
Santa Fe Railway Co.
Tinker Air Force Base
Tinker Credit Union
Mackie Automotive

1.3.4 Southwest Oklahoma City

Southwest Oklahoma City includes the area west of Santa Fe Avenue and south of Reno Avenue, excluding the downtown area. Although it is located within this area, the Mustang municipality is not included in this inventory. The North Canadian River serves as the major landscape feature, and residential land use occurs both east and west of the Will Rogers World Airport. Trail facilities are lacking and bicycle and pedestrian access to local destinations is limited, even in the City's largest concentration of motels and restaurants along S. Meridian. The South Canadian River forms the City's southern boundary in Southwest Oklahoma City. The old, long South Canadian River highway bridge to Newcastle on south Meridian is a potentially scenic river crossing since it is now closed to automobile traffic.

The North Canadian River follows natural meanders throughout much of Southwest Oklahoma City. Although formal, maintained trail facilities do not exist along the river corridor, evidence of “cow paths” suggests that some bicycle and pedestrian use is occurring. Planning is underway for multi-use trails to be included in riverfront redevelopment projects.

Urban Activity Corridors in Southwest Oklahoma City are similar to those previously described. They were designed to accommodate only automobile traffic, and are dangerous and intimidating to bicyclists, pedestrians and other non-motorized users. One particular activity corridor in this area, Meridian Avenue from Reno to SW 29th, is a key area for travelers and tourists and features over 4000 hotel rooms, 3 dozen restaurants, and the region's water-based theme park.

Commerce Street (SW 25th) from Shields to Walker Ave.
South Western from the downtown to SW 134th Street
Service roads along I-240 from I-35 west to May Ave.
SW 29th from Santa Fe to Portland
Meridian Avenue from Reno to SW 29th

Residential Neighborhoods are substantial in the Southwest Oklahoma City area. These neighborhoods exhibit the same characteristics of other residential neighborhoods mentioned in this study. Two major residential areas are south Oklahoma City and the area between Mustang and Yukon.

Schools and Colleges serve as primary destinations for many Southwest Oklahoma City residents. Bicycle and pedestrian travel to school sites is limited due to the lack of sidewalks and other off-road trail facilities. Oklahoma City Community College offers limited access for pedestrians and off-road bicyclists, but bicycle storage facilities are provided on-campus.

Adams School
Briarwood Elementary
Capitol Hill High
Calvin Coolidge School
Earlywine School
Fairview School
Fisher School
Herronville School
Jackson Junior High
John Glenn School
Lafayette School
Mt. St. Mary's High
Mustang Trail
Mustang North Middle School
Oklahoma City Community College
Prairie Queen School
Rockwood School
Sacred Heart School
Southern Hills School
Stand Watie Elementary
Western Heights Junior High
Western Heights Senior High
Westmoore High
West Jr. High
Will Rogers School
Winds West Elementary

Arthur School
Brink Middle School
Capitol Hill Junior High
Columbus School
Eastlake School
Fillmore Elementary
Grant Senior High
Hillcrest School
Jefferson Junior High
Kingsgate Elementary
Lee School
Mustang Creek
Mustang Valley
North Middle
Pierce School
Red Oak Elementary
Roosevelt Junior High
Sky Ranch School
St. James

Brock Park provides excellent opportunities for trail development

Community and Neighborhood Parks in Southwest Oklahoma City serve as destinations for local residents. Of special note are Brock Park and Oliver Park, two linear recreation centers located through residential areas. Although no bicycle or pedestrian facilities exist within either park, their linear nature and location offer excellent opportunities for a trail, connecting residential and commercial areas. Earlywine Park is a regional park located at SW 119th and May Avenue. The majority of the parks listed offer limited off-road trail facilities.

Airport Heights Park
Brookwood Park
Brock Park
Earlywine Park

Elm Grove Park
Hosea Vineyard Park
Lippert Park
Manuel Perez Park
Merrel Medley Park
River Park
Sellers Park
Siler Park
Taylor Park
Wheeler Park
Wiley Post Park
Woodson Park
Youngs Park
Zurline Park
Goldman Park
Lightning Creek Park
Lorraine Thomas Park
May Park
Oliver Park
Rotary Park
Sertoma Park
Southern Oaks Park
Tulsa Park


Stockyards City

Stockyards City is a public activity center and destination located in Southwest Oklahoma City near the downtown area. It is a National Register Historic District and includes an array of shops and restaurants and the oldest and largest live cattle auction in the world. Although it is a popular attraction, bicycle and pedestrian linkages to this area are lacking.

Shopping Centers in Southwest Oklahoma City are very similar to those described in the Northwest Oklahoma City section.

74 South Shopping Center
Farmers Public Market
Penn 89 Plaza Shopping Center
Southern Hills Shopping Center
Walnut Creek Shopping Center
Airline Shopping Center
Lightning Creek Shopping Center
South Penn Plaza Shopping Center
Town & Country Shopping Center

Other Public Facilities in Southwest include the area's regional airport and three libraries: Capitol Hill, Wright, and Southern Oaks.

Hospitals and Medical Centers in Southwest Oklahoma City are very similar to those described in the Northwest Oklahoma City section.

Hillcrest Hospital
Southwest Medical Center

Major Employers in Southwest Oklahoma City are similar to those described in the Northwest section. Major employment nodes that exist within this region are near: SW 44th and Western, SW 59th and MacArthur, Reno and Meridian, I-240 and Pennsylvania, Reno and Council, Reno and Morgan Road, SW 29th and Council, and SW 15th and May Avenue.

AAR Oklahoma, Inc.
Altec Lansing Corporation
Bryson, Inc.
CVR Corp.
Dayton Tire and Rubber
Downtown Airpark, Inc.
Evans Electric
Federal Aviation Administration
Hillcrest Health Center
Hormel Fine Frozen Foods
Langston Company
Metal Container Corp.
Organon Teknika Corp.
The Radisson Inn
Southwest Electric Co.
T. B. C. Fabrication Inc.
United Parcel Service
Autocraft Industries
AT&T Network Systems
Applewood's Inc.
CPC Southwind Hospital
Ted Davis Manufacturing
Deluxe Check Printers
Embassy Suites
Evans Home Furnishing
Fox-Smythe Transportation
Holiday Inn West
Jacks Service Co.
Mathis Brothers Furniture Co.
Oklahoma City Community College
Pacesetter Corp.
W&W Steel Company
Southwest Medical Center
Trinity Industries, Inc.
Will Rogers World Airport
Fred Jones Manufacturing

1.3.5 Downtown Oklahoma City

Downtown Oklahoma City is located in the geographic center of the city, bounded generally by Western to the west, Tenth Street to the north, Fourth street to the south and Lincoln/Byers Ave to the east. The downtown is primarily a commercial area and a daily destination for many private and public sector employees. It is also a popular tourist destination with its many cultural attractions. Downtown Oklahoma City is bicycle and pedestrian tolerant due to the numerous, well-maintained sidewalks and low traffic volume, although non-motorized access from the fringes of downtown is limited and few bicycle parking facilities exist.

Bricktown

A park in downtown

Bricktown was once an economically depressed warehouse industrial area located immediately east of Downtown Oklahoma City. A revitalization effort converted it into Oklahoma City's newest entertainment and dining district. Bricktown's shops and restaurants are now major attractions for residents and tourists alike. Limited bicycle and pedestrian facilities are being developed within the area, however, non-motorized linkages to the area are limited.

Schools in Downtown Oklahoma City include the Emerson Alternative Center. Bicycle and pedestrian access to this facility is adequate.

Community Parks in Downtown Oklahoma City, although not as large as other parks, provide attractive open space within the area. Sidewalks and low traffic volume roads allow for non-motorized use of the park facilities.

Bicentennial Park
Draper Memorial Park
Foster Center
Kerr Park

Other Public Facilities and Special Use Areas are numerous in the Downtown Oklahoma City area. Myriad Gardens, Myriad Convention Center, Stage Center and the Civic Center Music Hall are major attractions in Downtown Oklahoma City. The Murrah Federal Building bombing site and future National Memorial will draw thousands of visitors to the area. Sidewalks and low traffic volume provide adequate conditions for bicycle and pedestrian travel to these destinations.

Myriad Gardens

City of Oklahoma City
Alfred P. Murrah Federal Building Site
Civic Center Music Hall
Main Library
Main Post Office
Myriad Convention Center
Myriad Gardens
Oklahoma City Chamber of Commerce
Oklahoma City City Hall
Oklahoma County Court House

Major Employers in the downtown area are more accessible by bicycle or on foot than those described in previous sections, due to low traffic volume and adequate sidewalk space. However, improvements such as bicycle parking, shower facilities, walking and fitness programs, and financial incentives for bicycle and pedestrian commuting are needed. These programs could be initiated in coordination with the development of off-road facilities that connect these workplaces to residential areas.

Future site of the Murrah Federal Building Memorial

American Fidelity Insurance
Anson Gas Corporation
Bank of Oklahoma
Boatmen's First National Bank of Oklahoma
Borden, Inc.
Bricktown Brewery

Bridgestone/Firestone, Inc.
The CIT Group
Canteen Service Company
City of Oklahoma City
Coates Field Service, Inc.
Dana Corp.
Federal Reserve Bank
Globe Life & Accident Insurance Co.
IBM Corp.
Fred Jones Automotive Group
Internal Revenue Service
Kerr-McGee Corp.
Medallion Hotel
Nuway Services Inc.
Oklahoma Farmers Union
Salvation Army
Southwestern Bell Telephone Co.
The Spaghetti Warehouse
U.S. Postal Service
Oklahoma Natural Gas
Devon Energy Corp.

Brittain Brothers
Cain's Coffee Company
City Bank & Trust Co.
Climate Master, Inc.
County of Oklahoma
Enogex Inc.
Guaranty Bank & Trust Co.
U.S. Government
Journal Record Publishing
Fred Jones Manufacturing Co.
Journal Record
Liberty Bank
Mustang Fuel Corp.
OG & E
Public Supply Co.
Sonic Industries, Inc.
State of Oklahoma
International Environmental Corp.
W. H. Stewart Steel Co.
Crowe Dunlevy

1.4 Existing Trails and Bicycle Facilities

The following is a brief overview of the locations of several off-road trail facilities within the Oklahoma City.

1.4.1 Oklahoma City Lakes

An entrance to Lake Hefner Trails

Trail facilities exist at all three of the city's lakes—Lake Hefner, Lake Stanley Draper and Lake Overholser. A 2.8 mile bicycle lane and 2.4 mile trail system is provided at Lake Hefner, and a 13.4 mile bicycle route and mountain bike trails are located at Lake Stanley Draper. Lake Hefner also accommodates mountain bike use. Lake Overholser accommodates bicyclists and pedestrians on unmarked asphalt trails on the southeastern side of the lake. Kids Lake near Hefner Parkway and Grand Boulevard features pedestrian trails. All of these facilities function primarily as recreational resources. Bicycle and pedestrian access to any of the lakes is extremely limited.

1.4.2 Local Parks

A small number of local parks within Oklahoma City include asphalt and gravel pedestrian trail systems. Dolese Park, Martin Park and Memorial Park in the Northwest section of the city each provide up to two miles of trail for walking and jogging. Merrel Medley Park and Earlywine Park in the Southwest and Myriad Botanical Gardens in the Downtown also provide short-distance walking and jogging facilities, as do Top-O-Town Park and Kids Lake. The trails within these parks are used as recreation, rather than transportation, corridors since they do not provide linkages to destinations.

Trail at Dolese Park

1.4.3 Sidewalks

Sidewalks are lacking in many sections of Oklahoma City. Neighborhoods developed before WW II usually have sidewalks, but they are not common in the suburban postwar neighborhoods. Newer sidewalks are generally

limited to campuses, shopping centers, tourist/visitor areas, and hospitals. In recent years, however, these pedestrian facilities have been provided on the interior of some new neighborhoods. Also, many suburbs have sidewalk requirements and have subsequently developed walks in neighborhoods and along arterials. Sidewalks are virtually absent along the major thoroughfares away from the inner city, and are not required along transit routes. Most sidewalks within Oklahoma City do not currently demonstrate great transportation value because they do not provide continuous pedestrian routes between residential areas and destinations.

1.4.4 On-Road Bicycle Routes

There are four on-road bicycle routes in the study area. These bicycle routes were designated around 1980 and total 17.8 miles. The first extends for a short distance in Southwest Oklahoma City from Wiley Post Park along Harvey Avenue, 50th Street, Santa Fe Avenue and 33rd Street, forming a loop. The second is a longer route along NW19th Street, Drexel Boulevard, NW12th Street, Indiana Avenue, and 4th Street. The third follows Harvey Avenue and Dewey Avenue in northwest Oklahoma City. There are no special improvements along these roads to accommodate cyclists and the limited signage does not include information such as nearby destination points and mileage. The fourth route is a ring road around Lake Stanley Draper. These bicycle routes are primarily for recreational riding or access to the Central Business District since they do not connect to likely destination points for commuters.

1.5.5 Planned Facilities

In addition to the trails and bicycle facilities that are currently in place, plans are underway to expand and develop more off-road trails in Oklahoma City. At Lake Hefner, an extension of Hefner Trails and a mountain bike facility have recently been established. The mountain bike facility is located north of Pat Murphy Park. Another mountain bike facility is planned at Lake Stanley Draper on 180 acres. At least 8 miles of bicycle and pedestrian trails are planned along the North Canadian River as part of the proposed river redevelopment project, and an abandoned railroad right-of-way between Bricktown and northeastern Oklahoma City is available to be developed as a 6 mile transit route and trail. A three mile trail along Grand Boulevard/SW 36th Street is also funded.

Plans for trail or bike route facilities in neighboring communities also exist, which could be incorporated into the overall trail system for Oklahoma City. The City of Norman has a bike route plan, Midwest City has a two-mile trail in place, and Del City is scheduled to build a trail in 1997. Also, a rail-to-trail project has been suggested in the Midwest City-Del City area. The Association of Central Oklahoma Governments (ACOG) is preparing a regional bike route study.

Chapter Two
Vision, Goals and Objectives

2.0 Overview

The need for a trail system that will provide connections to major destinations throughout Oklahoma City was identified in Technical Memorandum Number One of the Trails Master Plan. The vision for a community-wide trail system that will satisfy this need is defined within this Technical Memorandum. Goals and objectives for how these off-road trail facilities are planned, designed, implemented and managed are also defined.

2.1 The Vision for a Community-Wide Trail System

The Oklahoma City Trails Master Plan makes recommendations for a community-wide regional trail system. Such a system is not simply a bike route system or a collection of random pathways, it is a continuous network of trails that winds within and throughout Oklahoma City, and provides connections to nearby cities and towns. The trail system essentially serves as a "backbone" for Oklahoma City, a network that parks, neighborhoods, and business districts can plug into as these areas develop their own individual trail routes. Routes in the system are to be developed in consultation with neighborhood associations, local institutions and area businesses,

The development of a trail system throughout Oklahoma City will provide safe and convenient facilities for walkers, joggers, bicyclists, rollerbladers, people with strollers and those confined to wheelchairs. It will serve to connect residential areas to significant outdoor recreation areas, such as the City's lakes, waterways and parks. It will also offer citizens a choice in transportation, improving conditions for bicycling and walking to popular destinations, such as employment centers, retail establishments, tourist attractions, medical facilities, and schools. Since trail use is a non-polluting transportation mode, a trail system will improve air quality in Oklahoma City and will protect water quality through preserving undeveloped land. The development of a trail system in Oklahoma City will also improve the local economy through tourism revenues, increase property values, support the development of neighborhoods that welcome and accommodate trail use, and foster more livable communities.

The following text further defines the elements of a comprehensive vision for a system of multiple use trails, and the benefits that this system will have on the communities of Oklahoma City.

2.1.1 Access to Outdoor Recreation

Oklahoma City is fortunate to include many natural resources that are in close proximity to the places where people live and work. Some of these resources serve as popular recreation destinations. However, gaining access to them by bicycle or on foot can be challenging due to a lack of existing sidewalks and trails. A network of corridors throughout the city will enable both residents and visitors to access and enjoy outdoor activities at local parks, lakes and rivers.

Today, the most popular form of outdoor recreation in the country is walking for fitness and health, and bicycling and rollerblading are the two fastest growing outdoor activities nationwide. Both roadway cycling and mountain biking are attracting new enthusiasts. There is and will continue to be a high demand for safe and convenient public places to walk, bicycle and rollerblade. The trails recommended in the Oklahoma City Trails Master Plan will provide such facilities.

2.1.2 Expanding Transportation Choice

As Oklahoma City continues to grow and prosper into the next century there will be opportunities to expand the transportation network to better serve residents. A transportation system that relies primarily on automobile travel decreases the efficiency of transit, and discriminates against the elderly, the very young and those that cannot afford a car. In order to be recognized as a progressive community and desirable place to live and work, the city will need to focus on expanding the choice in transportation to provide for bicycling and walking.

The importance of a multi-modal transportation system is supported by the transportation needs and habits of Americans. In 1990, the U.S. Department of Transportation commissioned a Nationwide Personal Transportation Survey to define the transportation habits and choices of Americans. This survey revealed that only one in five trips involved travel to and from work, and that the majority of trips (42%) were made for personal business reasons (i.e. travel to and from a

grocery store, doctor, school, shopping, etc.). Twenty five percent of all trips were made for social or recreational pursuits (i.e. travel to a friend's house, church, park or playground, sporting event, pleasure trips, vacation, etc.). This Master Plan has revealed that a significant number of personal business destinations are in close proximity (5 miles or less) to where people live and work in Oklahoma City. It is very realistic to assume that residents would in fact make use of alternative modes of transportation if the choice were offered.

2.1.3 Quality Community Growth

The growing trend in real estate development throughout the United States is toward pedestrian and bicycle friendly communities. In a 1995 poll commissioned by the National Homebuilders Association of America, 88% of the new homebuyers surveyed preferred to live in neighborhoods and communities that offer access to outdoor resources, safe places to walk and ride bicycles, and safe streets conducive to low volume and low speed traffic. Traffic calming techniques can encourage use of non-motorized transportation modes.

It is a fact that sprawling, single purpose development creates greater distances for travel and increases dependence on the automobile for transportation. A progressive practice in neighborhood development that is becoming popular today is neo-traditional community design, whose hallmark is compact, integrated neighborhoods with a mix of housing, commercial, office, recreation and retail land uses. These new urbanist neighborhoods are oriented towards meeting the daily needs of community residents by offering services and destinations that can be reached within a 20 minute walk. This type of development is captivating homebuyers and developers alike because of its sensible approach to community living and has become a model for the future. A trail system within Oklahoma City would support the development of neighborhoods such as these into the next century; offering access to outdoor resources, streets designed for human living as well as automobile traffic, and opportunities to walk and bicycle for transportation, recreation and fitness.

2.1.4 Trails and the Local Economy

Oklahoma City can benefit economically by the development of a trail system. This region is currently transitioning from an economy based on agriculture and fossil fuels to a more diversified economic base that includes service-oriented businesses and light industry. Tourism is a sustainable way of fostering new businesses that will contribute to the growing diversified economy of the City.

The tourism revenues generated by off-road trails have been documented for communities across the country. A 1992 National Park Service study found that three trails, in Florida, Iowa and California, together generate over $3.5 million a year in tourism revenue. Trails have been known to spur the creation of new businesses and the revitalization of old ones, including restaurants, bed and breakfasts, bicycle shops, convenience stores and campgrounds.

Additionally, homebuyers have begun to recognize the benefits of trail facilities and are showing a preference for properties close to them. This has led to an increase in the value of trail-side properties. Residential developers now typically sell homes on or near greenways and trails for more money than homes that are farther away from these amenities.

2.1.5 Enhancing the Quality of Life

Communities are continuously looking for ways to improve their "quality of life", which not only includes highly skilled labor, an educated workforce, low taxes and a strong economy, but also a clean environment, good education system, access to outdoor resources and neighborhoods that are friendly and free of crime. The quality of life in Oklahoma City will be improved by the development of a trail system that offers safe, convenient facilities linking neighborhoods, schools, businesses and recreational resources. This improved quality of life will attract individuals and corporations wishing to relocate and invest in the community, thereby strengthening the local economy.

2.1.6 Improving the Environment

Greenways and trails improve the environment in three primary ways--by conserving open space, improving air quality and improving water quality. A trail system in Oklahoma City can be used as a tool for conservation, because the development of a trail conserves the natural resources within a strip of land while allowing access to those resources. Trail users may then develop a greater appreciation and respect for these areas, and may work to further protect and enhance them.

Visitors and residents of Oklahoma City will take advantage of opportunities for walking and bicycling provided by off-road trail facilities. Choosing to utilize a mode of transportation other than the automobile, individuals will directly improve

air quality in the region by decreasing the amount of pollution emissions.

Water quality will also be improved by the development of trail facilities along rivers, lakes and streams. An undeveloped strip of land, such as a greenway trail, adjacent to a waterway provides a buffer zone which filters out pollutants and sediments. The development of the Oklahoma City Trails System will lead to a cleaner and healthier environment to be enjoyed by all.

2.1.7 Educating the Public

The Oklahoma City Trails System will also provide educational opportunities for residents and visitors. Examples of other communities that have incorporated educational themes in the development of trail facilities include the Swift Creek Recycled Greenway in Cary, NC, where the use of recycled waste by-products is the featured element of the trail; the Stones River Greenway in Murfreesboro, TN, which emphasizes civil war history; and the Boulder Greenway System in Boulder, CO, where "outdoor classrooms" help children learn about surrounding natural systems. Education and independent learning are an important part of the vision for a trail system in Oklahoma City.

2.2 Goals and Objectives

Public input from trail advocates, interested citizens, local government staff and elected officials is essential for the successful development of a Trails Master Plan. As a part of the planning process, local citizens were asked to participate in three workshops to define appropriate goals, objectives and policies for trail development throughout Oklahoma City. These workshops took place on June 18,19 and 25, 1996 in Oklahoma City. The goals, objectives and policies listed on the following pages were compiled from lists developed by approximately 80 local citizens during these workshops. The citizens attending the community meetings were asked to "brainstorm" goals and objectives for each of five topics: transportation, education, economic development, environment and safety. These goals and objectives reflect the community values and attitudes of local residents toward the development of a trail system in Oklahoma City.

2.2.1 Transportation Goal

Pursue a balanced, multi-modal transportation strategy that encourages bicycle and pedestrian travel throughout Oklahoma City connecting urbanized areas to suburban and rural landscapes.

Policies and Objectives

- Provide bicycle and pedestrian linkages to existing trail facilities.
- Integrate trail facilities as an important component of an intermodal transportation system.
- Provide a continuous system of trail facilities linking neighborhoods, schools and parks.
- Establish bicycle and pedestrian connections to workplaces as an alternative transportation mode and for recreation.
- Provide trail linkages from the lakes and suburban areas to downtown Oklahoma City.
- Provide trail linkages from Lake Hefner to Lake Overholser to the North Canadian River.
- Ensure easy access to trail facilities by encouraging construction of trails along creeks and other natural areas to serve as greenway links.
- Encourage the preservation of rail corridors for trail use.
- Provide secure storage facilities for bicycles.
- Promote a more bicycle and pedestrian friendly lifestyle.
- Implement a "free yellow bike" program, like that in Seattle and other cities, to encourage bicycle travel. A private or non-profit group would be sought to sponsor this activity.
- Encourage the installation of trails, bike routes, and/or sidewalks concurrent with

road, highway, and turnpike construction projects; such as the replacement of the Broadway Extension, I-40 Crosstown, I-35, and/or local street paving projects.
- Encourage the development of standard bike lanes along new roadway projects and roadway improvements and improve maintenance and marking of existing lanes, where feasible.
- Improve the cyclist's and other trail user's access to public transit with facilities such as bike racks for buses and walkways along key bus routes.

2.2.2 Education Goal

Develop a comprehensive educational program that provides ongoing environmental, historical and cultural information and learning situations that will inform and educate local citizens of all ages who use the trails.

Policies and Objectives

- Educate the public on the importance of a trail system in Oklahoma City.
- Promote community participation in the planning, development and management of the trail system.
- Highlight existing historic, environmental and cultural resources along trails and, where possible, develop trails near these significant resources.
- Encourage local bicycle shops, cycling groups, youth organizations and law enforcement agencies to participate in bicycle safety education programs.
- Encourage corporate bicycle suppliers to distribute bicycle safety education information.
- Expand the educational curriculums of primary and secondary schools to include bicycle safety programs, and promote awareness of the ODOT bicycle safety literature.
- Promote awareness of historical routes such as the Abilene, Chisholm and other cattle trails that traveled more than thirty miles through Oklahoma City.
- Establish outdoor classroom facilities along trails, where possible.
- Provide bicycle and pedestrian linkages to the libraries in the area.
- Educate the public on the location and use of trail facilities.
- Educate motorists to the rights of bicyclists and pedestrians and the locations of bicycle routes.

2.2.3 Economic Development Goal

Establish a trails master plan that will be sustainable and cost effective to implement, improving the quality of life and economic growth of Oklahoma City.

Policies and Objectives

- Stimulate new trail-related businesses such as bicycle rentals and other recre-

ational shops that benefit tourism and local residents.
- Increase tourism and stimulate business by distributing maps and other trail-related information to tourists (especially RV users).
- Increase property values of lands adjacent to trail facilities by making real estate companies and homebuilders aware of these amenities.
- Include the trail system as a quality of life amenity to retain and attract employers.
- Coordinate the development of a trails system with the Metropolitan Area Projects (MAPS) developments.
- Promote trail use by sponsoring events on trail facilities.
- Take into consideration long term maintenance needs and costs in the trails master plan.
- Reduce costs by preserving and adaptively restoring historic bridges, such as the one on Route 66 for trail use.
- Identify potential short and long term funding sources associated with trail plan implementation.
- Establish public/private partnerships to encourage trail development throughout Oklahoma City.
- Establish intergovernmental partnerships to encourage development of regional trails and to help achieve the trails master plan goals.
- Encourage support for trail transportation by key economic development trusts, such as those responsible for transit, airports, water and waste water, and rivers.

2.2.4 Environment Goal

To create and implement a trails master plan that will conserve and enhance all of Oklahoma City's natural resources with respect to rivers, flood control, ecological systems, water quality, air quality and wildlife habitat.

Policies and Objectives

- Reduce noise and improve air quality in the area by providing bicycle/pedestrian corridors as viable alternatives to motorized transportation.
- Recognize and encourage the use of mountain bikes, but also recognize the need for cyclists to minimize trail soil erosion
- Protect and conserve natural areas and wildlife habitat in the Oklahoma City area while allowing trail access to these areas.
- Encourage the creation of a tree planting program to complement trail development that will provide shade during the summer months and wind screening during the winter months.
- Encourage the involvement of local nurseries and landscape companies as partners in trail development.
- Utilize aesthetically pleasing environments in selecting trail corridors, where possible.

2.2.5 Safety Goal

Provide a safe, secure environment for all persons utilizing the trail system. Ensure that the implementation of the trail system does not endanger or degrade public health, safety and welfare.

Policies and Objectives

- Provide safe trail access for those children who commute to nearby schools and parks.
- Develop trails in Oklahoma City with specific standards that ensure the safety of trail users.
- Resolve multi-user conflicts on trails through design and education programs.
- Provide adequate lighting along trails that are open after dark.
- To ensure the safety of the trail user, establish safe crossings at congested intersections as well as safe corridors.
- Provide 911 call boxes along trail facilities.
- Work with local law enforcement agencies to establish police patrols along trails as they are developed.
- Provide well-marked trails.
- Develop, post and enforce trail rules along trail facilities.
- Educate motorists to the rights of bicyclists and pedestrians.
- Educate motorists to keep bicycle lanes free of trash.

2.3 Public Opinion Surveys

During the June 18, 19 and 25 workshops conducted by the consulting team, public opinion surveys were distributed to assess the need for trail facilities among Oklahoma City residents. Most of the participants of the workshop stated that they enjoyed walking, bicycling for recreation and bicycle commuting, with walking noted as the most enjoyed activity. Over 75% of the participants have been on a trail and have ridden their bikes or walked to work, school, shopping areas, and area attractions within the last six months. Most participants agreed that they would use the future trail corridors for recreation, fitness and to enjoy the environment. Nearly all of the participants stated that if trails were provided between their homes and work, grocery stores, recreational and cultural facilities, and parks, then they would walk and bike to these places.

A large majority felt that paved paths, trails and greenways are needed most in Oklahoma City, followed by bicycle lanes and unpaved paths, trails and greenways. Citizens suggested various locations for trail facilities, including city lakes, neighborhoods and the downtown area. Citizens representing motorized trail use interests expressed their concerns, however, this issue will not be addressed by the trails master plan. All citizens supported the development of trails and the use of public money to develop them, and all citizens felt that the development of a trails system within Oklahoma City would increase the quality of life in their community.

Chapter Three
Facility Design Guidelines

3.0 Overview

This report provides guidelines to both public and private entities for the development of trail facilities (including sidewalks) throughout the Oklahoma City area. The regional guidelines herein are based on the best practices in use throughout the United States, as well as accepted national standards for trail facilities. Local governments can use them at their own discretion.

The guidelines should be used with the understanding that each project is unique, and that design adjustments may be necessary in certain situations in order to achieve the best results. Such projects should be evaluated on a case-by-case basis, in consultation with the local or state bicycle and pedestrian coordinators, a qualified engineer and/or a landscape architect.

Facility design is a broad topic that covers many issues. The text in this chapter provides guidelines for design development, and is not a substitute for standards. For more in-depth information and design development standards, consult the following publications:

• Greenways. A Guide to Planning, Design and Development
Published by Island Press, 1993
Authors: Charles A. Flink and Robert Searns

• Trails for the Twenty First Century
Published by Island Press, 1993
Edited by Karen-Lee Ryan, Rails-to-Trails Conservancy

• Guide to the Development of Bicycle Facilities
Updated in 1991 by the American Association of State Highway Transportation Officials. Available from AASHTO or FHWA.

• Manual on Uniform Traffic Control Devices
Published by the US Department of Transportation, Washington, DC

• Mountain Bike Trails: Techniques for Design, Construction and Maintenance
Published by Bike-Centennial, Missoula, MT

• Construction and Maintenance of Horse Trails
Published by Arkansas State Parks

• Universal Access to Outdoor Recreation: A Design Guide
Published by PLAE, Inc., Berkeley, CA, 1993

At the time of this writing, there is no comprehensive national safety standard for pedestrian facilities, such as there is for bicycle facilities. The MUTCD, the Architectural and Transportation Barriers Compliance Board s American s with Disabilities Act Accessibility Guidelines and the American National Standards Institute address some aspects of pedestrian safety, and should be used as supplements to this document.

In all cases, the recommended standards in this report meet or exceed national standards. Should these national standards be revised in the future and result in discrepancies with this manual, the national standards should prevail for all design decisions.

3.1 Multi-Use Trails

A majority of the recommendations given in this section were developed from the nationally recognized guide for trail design, *Greenways: A Guide to Planning, Design and Development.* National standards for the design of multi-use trails or bicycle paths are provided by AASHTO s Guide for the Development of Bicycle Facilities (1991). Nearly 1/3 of the guide is devoted to trail design, and the requirements are quite detailed. The reader is cautioned that the following section of this manual is intended to provide further depth on design issues that the AASHTO Guide does not fully cover, or issues specific to Oklahoma. Many additional trail standards are provided in the AASHTO Guide. It should be used as a companion text to this chapter.

3.1.1 Trail Tread Design

Off-road multi-use trails are physically separated from motor vehicle traffic (except at crossings with streets) and built either within an independent right-of-way (such as a utility or railroad right-of-way), or along specially acquired easements across private lands. Such trails cater to a variety of users, including cyclists, pedestrians, joggers, rollerbladers and individuals confined to wheelchairs.

Single-tread, multi-use trails are the most common type of trail in the nation. These trails vary in width, can accommodate a wide variety of users, and are especially popular in suburban and urban areas. Multi-tread, multi-use trails are another type of trail which tends to reduce trail user conflicts, allowing for multiple use within the same right-of-way but on separate treads. An example of this type of trail would be an asphalt multi-use trail constructed adjacent to a crushed stone

Figure 1: Single Tread/Multi Use Trail

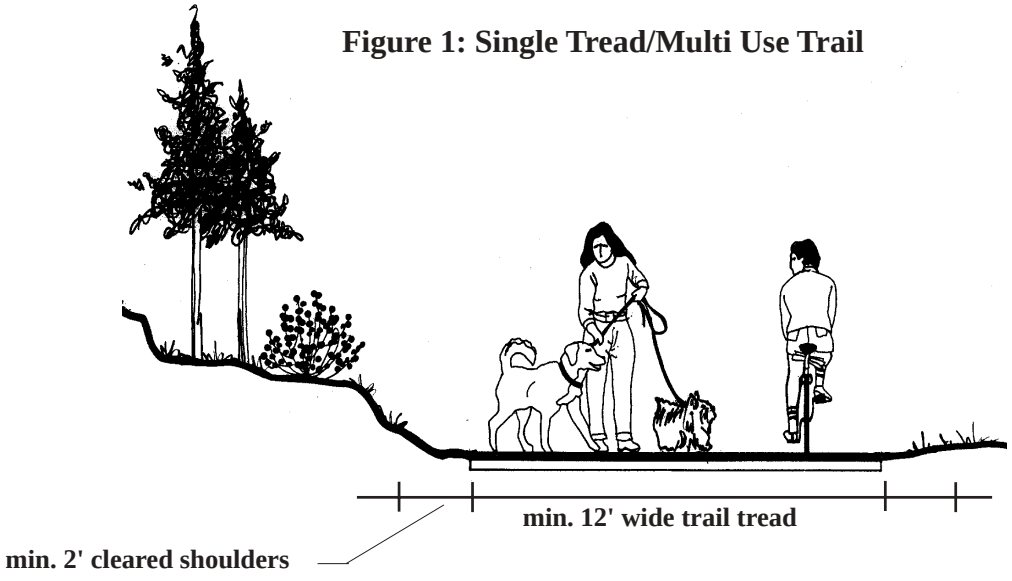
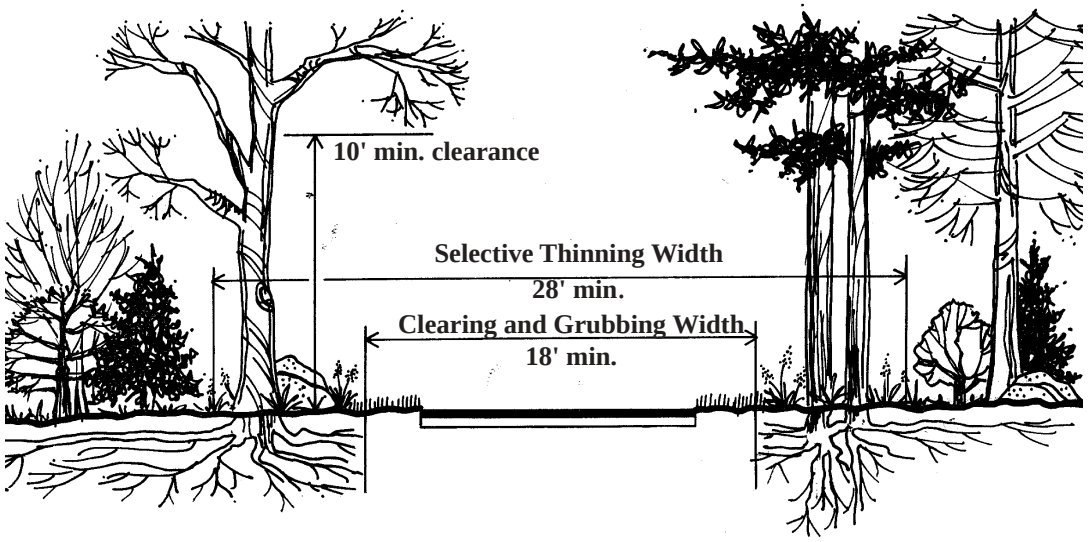


Figure 2: Vegetative Clearing



equestrian path. Trails limited to a single use should only be developed when warranted by specific local conditions.

The minimum width for two-directional trails is 12', however 14' and 16' widths are preferred where heavy traffic is expected. Centerline stripes should be considered for paths that generate substantial amounts of pedestrian traffic. Possible conflicts between user groups must be considered during the design phase, as cyclists often travel at a faster speed than other users.

3.1.2 Pavement Design

Typical pavement design for off-road multi-use trails should be based upon the specific loading and soil conditions for each project. Trails designed to serve bicycle transportation purposes should be composed of a hard surface such as asphalt or concrete, and should be designed to withstand the loading requirements of occasional maintenance and emergency vehicles. It is recommended that trail crossings, every 700-1000 feet, be designed to withstand heavier maintenance vehicles such as water trucks.

In some circumstances, given an extremely stable trail bed (such as a rail-trail) and excellent drainage conditions, a soft-surface trail may be acceptable. Careful consideration should be given to the amount of traffic the specific trail will generate, as these surfaces tend to deteriorate with excessive use. These trails must also meet all other standards within this manual, and within AASHTO s Guide for the Development of Bicycle Facilities (1991).

One important concern for asphalt multi-use trails is the deterioration of trail edges. Installation of a geotextile fabric beneath a layer of aggregate base course

(ABC) can help to maintain the edge of a trail. It is also important to provide a 2' wide graded shoulder to prevent trail edges from crumbling.

Subgrade

The subgrade is the undisturbed earth of the corridor or, as in the case of existing railroad beds, placed and compacted fill material consisting of clay or aggregates. It is the primary foundation for a trail. Because the subgrade ultimately receives all of the load or weight on the surface of the trail, it is important that the subgrade be structurally capable of supporting the trail design load. The subgrade must also be sloped, by crowning the tread (making the center of the tread higher than the outer edges) or establishing a cross slope to provide proper drainage of surface and subsurface waters.

Subbase

The subbase is the area of the trail cross section between the subgrade and the trail surface. The primary function of this secondary artificial foundation is to transfer and distribute the load or weight from the surface of the trail to the subgrade. The subbase also serves vital drainage functions, preventing water from migrating up from the subgrade into the surface of the trail and allowing natural cross drainage to flow through the trail cross section. The subbase is usually constructed of stone, typically coarse graded aggregate.

The subbase can be either hand or machine placed and should be compacted with a mechanical roller that weighs at least as much as the designated design load of the trail. The surface of the subbase should be smooth and level. Any defects that remain in the subbase will be reflected in the surface of the trail.

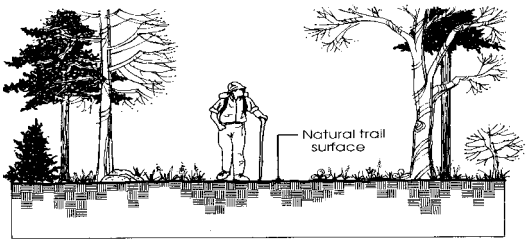
Geotextile Fabrics

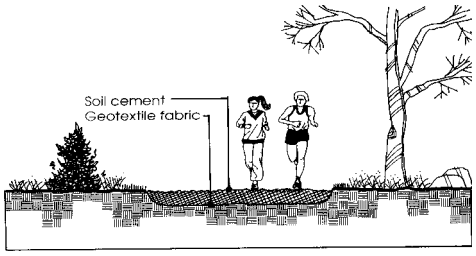
Geotextiles are woven and nonwoven fabric mats used to strengthen the subgrade, subbase, and surface of a trail, especially in areas where soft or unsuitable soils are present. Geotextiles are most commonly used to separate the subgrade from the subbase and trail surface and to reinforce the trail cross section. They maintain the composition and integrity of the subbase material and prevent this material from migrating into the subgrade--one of the most common causes of cross section and surface failure.

A geotechnical engineer should be consulted to assist in choosing the right product. When installed, the geotextile fabric should be extended at least one foot beyond the designated width of the trail tread. Fabric should overlap the trail ends by three feet to ensure that the geotextile fabric remains in place as the subbase is installed.

Surface Materials

Materials that can be used to surface a trail include natural materials, soil cement, graded aggregate stone, granular stone, shredded wood fiber, asphalt concrete, concrete, and wood. Surface materials are categorized as hard or soft, depending on their ability to absorb moisture. Soft surface materials are less expensive to install and compatible with the natural environment, however, they do not accommodate certain users, such as rollerbladers and disabled persons. Soft surface trails are preferred, however, by some runners and mountain bicyclists. Hard surface materials are more practical for multi-use urban and suburban trails, and require less maintenance.



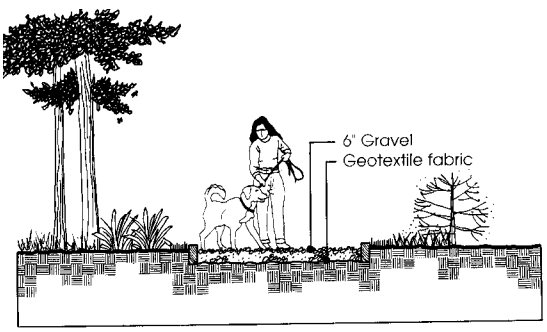


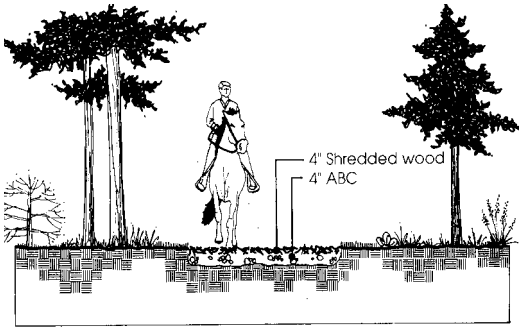
Natural surface trails make use of dirt, rock, soil, forest litter, sand, snow, ice, pine mulch, leaf mulch and other native materials. Preparation varies from machine-worked surfaces to those worn only by usage. This is the most appropriate surface for ecologically sensitive areas.

Soil cement is a mixture of pulverized native soil and measured amounts of portland cement. It will support most user groups, though bicyclists and horseback riders should have only restricted use. Soil cement surfaces last longer if installed on top of a properly prepared subgrade and subbase.

Graded aggregate stone material suitable for trail surfacing includes colored rock, pea gravel, river rock, washed stone and coarse sand. This surface will often need to be kept in place with wood or metal edging. Because it is a loose, uncompacted surface, graded aggregate stone is limited in application to flatter slopes.

Granular stone includes a broad range of aggregate stone, such as limestone, sandstone, crushed rock, pit gravel, chat, cinders, chert, sand and fine gravel. This is one of the best surface types for greenway trails because it can be densely compacted and is compatible with the natural environment. If properly constructed, granular stone can support bicycle and handicapped accessible trail development.

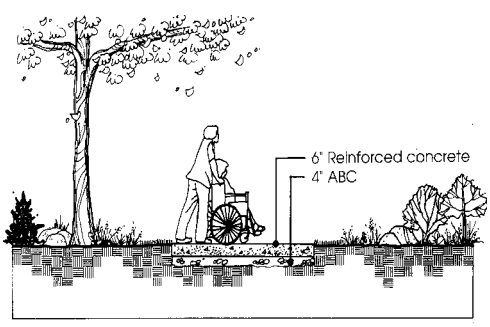


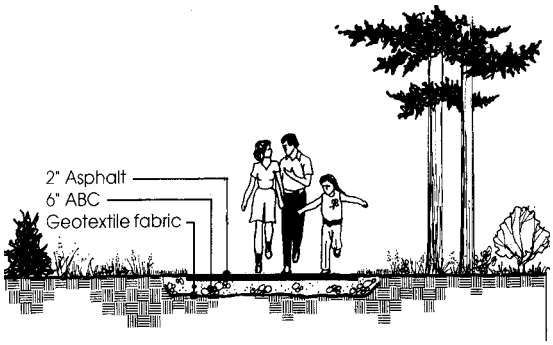


Shredded wood fiber is usually composed of mechanically shredded hardwood and softwood pulp, pine bark chips or nuggets, chipped wood pieces, or other by-products of tree trunks and limbs. This type of surface is favored by joggers and runners, equestrians and walkers because it is soft and blends with the natural environment. However, shredded wood fiber decays rapidly and must be installed on flat subgrades.

Asphalt concrete is a hard surface material that is popular for a variety of rural, suburban and urban trails. It is composed of asphalt cement and graded aggregate stone. It is a flexible pavement and can be installed on virtually any slope. The asphalt trail should be coated with a special sealant, particularly where it is exposed to the sun for long periods of time. To reduce the unraveling of the pavement edges, the trail should be recompacted periodically by a mechanical roller.

Concrete surfaces are capable of withstanding the most powerful environmental forces. They hold up well against the erosive action of water, root intrusion and subgrade deficiencies such as soft soils. Most often, concrete is used for intensive urban applications. Of all surface types, it is the strongest and has the lowest maintenance requirement if it is properly installed. However, the installation of concrete trails may severely impact the natural environment. Concrete surfaces





should be lightly textured, to prevent them from becoming slippery when wet. The specific load capacity of a concrete trail should be determined based on the expected activity on or around each specific trail segment.

Wood surfaces are usually composed of sawn wooden planks or lumber that forms the top layer of a bridge, boardwalk or deck. The most commonly used woods for trail surfacing are exposure- and decay- resistant species such as pine, redwood, fir, larch, cedar, hemlock and spruce. Wood is a preferred surface type for special applications because of its strength and comparative weight, its aesthetic appeal and its versatility. However, wood can be very slippery when wet.

3.1.3 Trail Amenities

Lighting

Particularly during winter months when trips to and from work are made in the dark, adequate lighting can make the difference in a person s choice to bicycle or walk. However, due to liability and security concerns, many off-road bicycle paths are closed at night, and therefore unlit. Lighting for multi-use trails should be considered on a case-by-case basis, with full consideration of the maintenance commitment lighting requires.

Trash receptacles

Trash containers are necessary along all trails. They can be attractive as well as functional and should be selected based on the amount of trash expected, overall maintenance program of the trail, and types of users. Trash cans need to be accessible to both trail users and maintenance personnel. At a minimum, 22-gallon or 32 gallon containers should be located at each entranceway and at each bench seating area. They should be set back three feet from the edge of the trail. The location of additional trash cans will depend upon the location of concessions, facilities adjacent to the trail and areas where trail users tend to congregate.

Benches

Benches along trails allow users to rest, congregate or contemplate. Trail benches should comfortably accommodate the average adult. They should be located at the primary and secondary entrances to the trail and at regular intervals, and should be set back three feet from the trail edge.

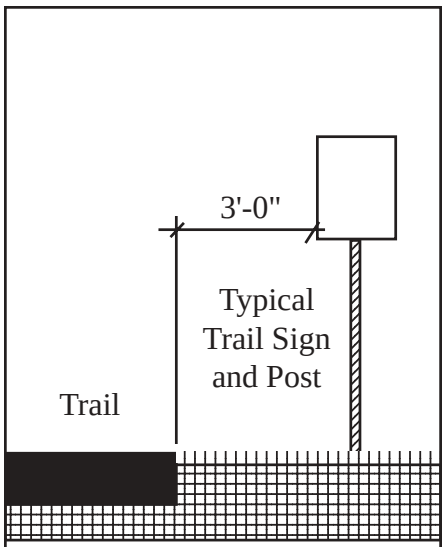
3.1.4 Signage

Signage provides trail users with information they need to use the facility. Signs need to be carefully designed and appropriately installed. At the same time, the designer should avoid oversigning which can clutter the environment and result in information overload. Signs need to be clear, concise and legible, and their location is critical. Trail signs can be divided into the following categories:

Informational signs orient users to their position within the trail system, provide an overview of the facilities, programs and activities, and describe routes to reach these facilities. These signs can also indicate the length of a trail, number of miles traveled, and average time required to travel to a particular destination. Additionally, signs can be used to recognize volunteers or donors who have supported the trail.

An important consideration is a street address system for a trail. Assigning a milepost, block number or some other community identification system enables police, fire, and medical personnel to respond immediately to incidents on the trail. These signs should be located at roadway and trail intersections and at key access points along the trail.

Directional signs can give instructions regarding a user's bearing and route of travel. Most directional signs are in the form of graphic symbols and brief descriptions. For example, directional signage can include arrows that indicate direction of travel and give descriptive text such as "this way" or "keep to the right".



Trail Sign Installation

Regulatory signs describe the laws and regulations that apply within the trail, such as permitted uses, hours of operation and speed limit. Regulatory signs must be uniform in terms of size, location and information. In order to ensure that the regulatory signage program offers the most complete, legally defensible, and clearly legible system of communication to a wide variety of user groups, consult the bicycle and pedestrian facility design section of the U.S. Department of Transportation's Manual on Uniform Traffic Control Devices (MUTCD). This manual presents a standardized and universally used signage system, and it provides the appropriate size, applicable color range, and physical relationship for each type of trail sign.

Warning signs are used to caution about various hazards, such as curves in the trail, slippery bridges, roadway crossings, steep downhill or uphill conditions, blind intersections, and changes in trail surface condition. All warning signs should be of uniform size and shape, located a minimum of 50 feet in advance of the hazard, and labeled with black lettering on a reflective yellow background.

Festival signs commemorate special events and holidays or add accent, color and decoration. Festival signs offer limited information about a specific event. They come in many different forms, from cloth banners to flags, to specially created pole-mounted hard surface signs.

Educational or interpretive signs describe the unique qualities or significance of natural or cultural features along a trail, such as age, habitat and historical significance.

3.1.5 Trail/Roadway Intersection Design

Trail/roadway intersections can become dangerous conflict areas if not carefully designed. For at-grade intersections, there are usually several objectives:

1. Site the crossing area at a logical and visible location.
   When at all possible, trails should be designed to meet roadways at existing intersections. If alternate locations for a bicycle path are available, the one with the most favorable intersection conditions should be selected. Midblock crossings should not be sited in close proximity to major intersections with other highways.

2. Warn motorists of the upcoming crossing.
   Warning signage and pavement markings that alert motorists of the upcoming trail crossing should be used in accordance with the MUTCD.

3. Maintain visibility between trail users and motorists.
   Vegetation, highway signage and other objects in the right-of-way should be removed or relocated so that trail users can observe traffic conditions, and motorists can see approaching trail users. Every effort should be made to locate midblock crossings on straight sections of roadway, rather than near curves where sight distance is limited.

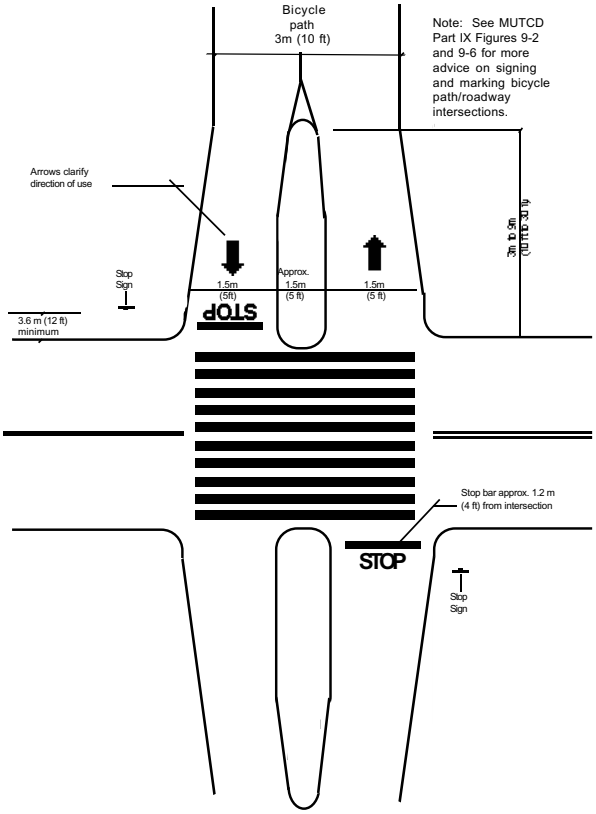


Figure 4: Trail/Roadway Intersection

4. Inform trail users of the upcoming intersection.
   Signage and pavement markings on the trail can provide advance warning of upcoming intersections, especially in areas where the intersection is not clearly visible 250 feet in advance.

Intersections and approaches should be on relatively flat grades. In particular, the bicyclist should not be required to stop at the bottom of a hill. If the intersection is more than 75 feet from curb to curb, it is preferable to provide a center median refuge area, per ADA (Americans with Disabilities Act) or ANSI (American National Standards Institute) standards. If crossing traffic is expected to be heavy, it may be necessary to provide a traffic signal that responds to bicycles and/or can be pedestrian-activated.

The need for parking should be anticipated during the master planning process for the trail system. Adequate parking at trailheads is necessary so that trail users do not park on the shoulder of the road near intersections, blocking the sightlines of both motorists and trail users.

For high speed multi-lane arterials and freeways, the only viable solution may be a grade-separated crossing. Overpasses can be extremely expensive and marginally successful if users are expected to climb long entrance ramps. In situations where multi-lane arterials are being installed by developers, they should be encouraged to install a box culvert (per national standards) for trail underpasses. Underpasses should not exceed 200 feet.

Underpasses should be of adequate width and should be well-lit with vandal-resistant fixtures. Approach ramps for grade-separated crossings must meet ADA or ANSI standards.

3.1.6 Restricting Motor Vehicle Access

Unauthorized motor vehicle access is an issue at some trail/roadway intersections. Regulatory signage should be posted at some intersections and sites. Trail bollards are the most effective method of limiting unwanted motor vehicles. However, much care should be taken in their use because they present a hazard when located in the traveling path of bicycles and pedestrians. Centerline pavement striping can be used to increase the visibility of bollards located in the center of the trail, as shown in the detail on this page.

Bollards should be painted a bright color and permanently reflectorized to maintain their visibility. Bollards should be sited 30 feet in advance of the intersection, so that cyclists can fully concentrate on maneuvering through the bollards and still have time to prepare for the upcoming intersection.

Bollards should be three feet tall, and can be constructed of a variety of materials. Several commercial manufacturers offer bollards that can be unlocked and removed to allow emergency vehicle or maintenance access.

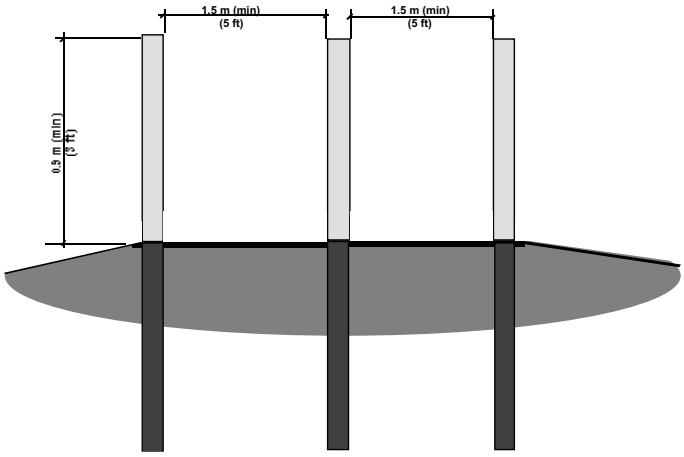


Figure 5: Cross Section of Bollards

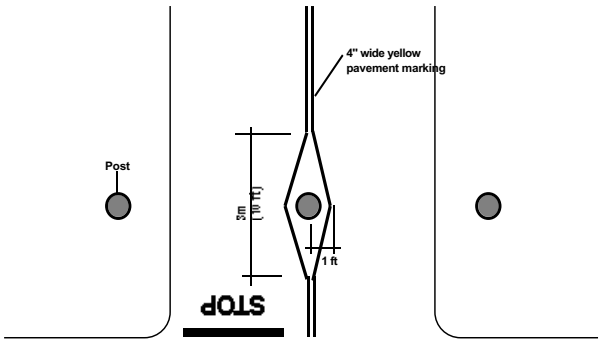


Figure 5: Plan View-Pavement Marking

3.1.7 Bicycle Paths Adjacent to Roadways

In the past, bicycle sidepaths (bikeways immediately adjacent to roadways) were developed with the concept of separating cyclists from roadways in order to reduce opportunities for conflict. It is now widely accepted that bicycle paths immediately adjacent to roads actually cause greater conflicts. These sidepaths create the following problems (excerpt from AASHTO s Guide for the Development of Bicycle Facilities, 1991):

1. Unless paired (on both sides of the road) they require one direction of bicycle traffic to ride against motor vehicle traffic, contrary to normal Rules of the Road.

2. When the bicycle path ends, bicyclists going against traffic will tend to continue to travel on the wrong side of the street. Likewise, bicyclists approaching a bicycle path often travel on the wrong side of the street in getting to the path. Wrong-way travel by bicyclists is a major cause of bicycle/automobile accidents and should be discouraged at every opportunity with signage and other means.

3. At intersections, motorists entering or crossing the roadway often will not notice bicyclists coming from their right, as they are not expecting contra-flow vehicles. Even bicyclists coming from the left often go unnoticed, especially when sight distances are poor.

4. When constructed in narrow roadway right of way, the shoulder is often sacrificed, thereby decreasing safety for motorists and bicyclists using the roadway.

5. Many bicyclists will use the roadway instead of the bicycle path because they have found the roadway to be safer, more convenient, or better maintained. Bicyclists using the roadway are often subjected to harassment by motorists who feel that in all cases bicyclists should be on the path instead.

6. Bicyclists using the bicycle path generally are required to stop or yield at all cross streets and driveways, while bicyclists using the roadway usually have priority over cross traffic, because they have the same right of way as motorists.

7. Stopped cross street motor vehicle traffic or vehicles exiting side streets or driveways may block the path crossing.

8. Because of the closeness of motor vehicle traffic to opposing bicycle traffic, barriers are often necessary to keep motor vehicles out of bicycle paths and bicyclists out of traffic lanes. These barriers can represent an obstruction to bicyclists and motorists, can complicate maintenance of the facility, and can cause other problems as well.

For these reasons, the AASHTO guide further states that there should always be a minimum of 5' between the trail and the roadway, except in unique circumstances such as bridges or bridge overpasses shared between trails and roadways. In these special situations, a 4.5' tall barrier between the path and the road should be erected, unless the path can be separated from the road by 5' or more. A separation of 10-feet or more may substantially reduce the risks caused by the hazard.

3.2 Bridge Design

Two of the most important structural considerations in determining how a bridge is to be built are the design load and foundation. Design load refers to the predictable forces and weights that affect the bridge over its projected life. Two types of design loads must be considered for every bridge the dead load and the live load. The dead load refers to the total physical weight of the bridge, including the superstructure, decking, railing, attachments, and other features of the bridge. The live load refers to the active forces and weight that the bridge is designed to support, including the number of people that the bridge can accommodate, automobile traffic, floodwaters that might encroach and engulf the bridge, debris in floodwaters that strike the bridge, wind, soil, snow or ice. The minimum design load for a bridge is the combination of forces and weights that would place the most stress on the bridge structure. The best reference on dead and live loads for bridges is the AASHTO Standards for Highway Bridges.

Foundations support the design load of the bridge. There are two typical types of bridge foundations: footings and piers. Footings spread out the design load through the soil mass and as such are constructed to be short and broad. Piers are generally tall, columnar, or rectangular posts constructed when there is a need for additional support along the length of the bridge. Piers direct the design load of the bridge to the soil, where the load is then distributed. The type of soil present within the project site usually determines the type of footing or pier design.

Footings are usually constructed of cast-in-place concrete. They can be combined with piles, concrete, or rock columns beneath the footing. The numerous types of footing design include open abutment, wall abutment and strutted or vertical beam abutments.

Piers are usually columns of wood, steel or concrete constructed on suitable soils and installed where there is a need for a long, multiple-span bridge. A pier can be used as a method for reducing the size of a footing, by assuming some of the weight that a footing would normally bear.

3.2.1 Decking

Decking is the surface of a bridge. It distributes the live load to the other parts of the bridge. Decking is most often made from wood planks but can also be made from poured-in-place concrete, precast concrete, rough finished metal plates, and fill material such as stone or soil.

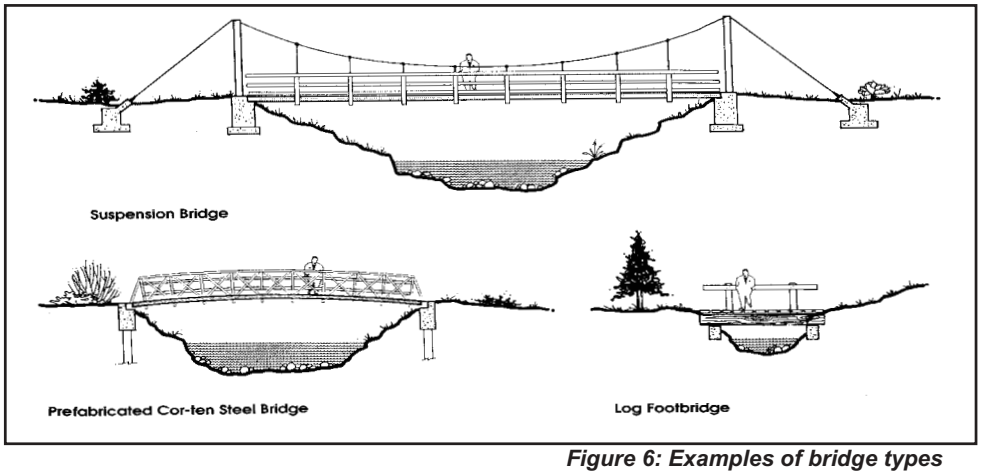


Figure 6: Examples of bridge types

Wood decking is usually constructed from standard-sized wood planks, nail-laminated lumber or glue-laminated lumber. Wood planks are cut in varying lengths, in widths of four, six, eight, ten and twelve inches. A minimum thickness of two inches is recommended for most bridge applications, however, four-inch thick decking provides greater strength and durability. Planks are generally laid perpendicular to the beams of the superstructure. Wood decking is almost always nailed or screwed to the superstructure.

The planks are laid with the bark side up so that they will not warp up over time. Wood decking requires good drainage and ventilation so that it does not become wet and slippery. The minimum spacing between planks is one-quarter inch and the maximum spacing for wilderness trails is one inch.

3.2.2 Railings

Bridge railings are required for all trail bridges, except where the height of the bridge is less than thirty inches or where a railing is impractical because of the characteristics of the bridge crossing, as in the case of a low water bridge. Most bridge railings for trails are constructed of wood, galvanized steel or aluminum.

Railings have two structural components: the post and the rail. The post is the vertical support member and is usually attached to the bridge deck or superstructure. The spacing of posts can range from any desired minimum distance to a maximum distance of six feet apart, depending on the size of the post. Rails are the horizontal member and are attached either to the post or, at times, directly to the decking, as with the toe rail. Railings for most trail bridges are generally composed of a top rail, a middle rail, and a bottom rail. AASHTO guidelines determine that the post and railing should be designed to support an outward transverse or vertical load of fifty pounds per linear foot of rail height.

Pedestrian railing, or handrails, must be installed at a minimum height of 3 6" above the surface of the bridge decking. If bicycles will be using the trail bridge, railing must be installed at a minimum of 54 inches above the surface of the deck. The maximum clear vertical opening between all railings is fifteen inches. If in lieu of three rails, vertical rails are installed, the maximum clear horizontal spacing is eight inches.

3.2.3 The Approach

The most neglected element of bridge design is the approach. Approach railings are constructed in the same manner as bridge railings, except that the railing posts should be installed in the earth rather than attached to the bridge superstructure. Approach railings extend a minimum of fifteen feet from each end of the bridge and terminate on an angle juxtaposed 45 degrees from the edge of the trail so that out-of-control users never hit the end of an approach rail. In addition, sight lines onto the bridge should be free of obstructions and the approach should be wider than the normal width of the trail in order to accommodate potential congestion on and immediately before the bridge.

Several different types of bridges can be constructed for multi-use trails: footbridges, constructed-in-place bridges, prefabricated bridges, low-water bridges and suspension bridges. Regardless of the type of bridge selected, a structural engineer must assist in its proper design and construction.

3.2.4 The Log Footbridge

The log footbridge has three components: log beams, decking and, in some cases, handrails. The beams are long straight timber poles. Clear spans of between ten and forty feet can be achieved with log beams. Logs are notched on the ends to prevent movement and provide attachment at either end of the crossing, or they can be roped or steel cabled together as one unit. Decking for log footbridges generally consists of sawn timber planks that are nailed directly onto the log beams. A toe board is also attached on top of the decking to add strength and to serve as an edge guide for trail users. Handrails are optional and depend on the height and length of the crossing.

3.2.5 Constructed-In-Place Bridge

Bridges constructed to fit a site-specific crossing are typically constructed of steel, concrete or wood. A variety of configurations can be used, including trusses, trestles, arches or prefabricate beams. Generally, there is no limit to the length of span that can be crossed by this type of bridge, although clear spans are restricted by design load and required spacing of foundations and superstructure.

3.2.6 Prefabricated Bridge

Prefabricated bridges are manufactured off site, delivered to the site, and assembled at the crossing. They are usually constructed from wood, steel, high strength metal alloys or concrete. Prefabricated bridges are less expensive, less damaging to the local environment, and can span greater distances than constructed-in-place bridges. Prefabricated bridge designers can accommodate various design load requirements, supply a variety of decking surfaces, and construct handrails of varying height and size. However, they are not responsible for footings, piers or trestles. The span length of prefabricated bridges ranges from 20 to more than 250 feet.

3.2.7 Low-Water Bridge

Low-water bridges are constructed to allow water to flow over the top of the bridge under certain conditions. They can be constructed-in-place or prefabricated from concrete, high strength rust-resistant metal alloys or wood. There are several different types of low-water bridge crossings, including clear-span aluminum arches, concrete culverts or pipes encased in concrete, precast concrete superstructure and decking, and temporary wooden logs or poles. Under high water or flood conditions, the surface of the bridge is usually inundated with flowing water. The advantage of a low-water bridge over the other bridge types is the reduced length of span required for the same crossing.

3.2.8 Suspension Bridge

There are two styles of suspension bridge: rope bridges, where rope cross bracing is used as the walking surface, and steel cable bridges with wood or metal superstructures and decking. Suspension bridges are more applicable in remote sites where it is virtually impossible to construct other types of bridges. It is not uncommon for these bridges to clear spans of 150 to 300 feet.

Suspension bridges have four structural components: a deck structure, rope or cabling, cable towers, and concrete footings at either end of the bridge. On some bridges, steel rods may serve as vertical supports, attached between the superstructure and the cable connected to each support tower. The decking superstructure can be constructed solely of wood or can have a steel beam system with a wooden deck. Flexible steel cables extend from tower to tower in a natural arc, with drop cables or steel rods running from the primary cable to the superstructure. The towers at the ends of the bridge are of a predetermined height to support the length of the crossing and are usually constructed of large timber poles or prefabricated steel columns. The entire system is supported by concrete footings at each end of the bridge.

3.2.9 Shared Bridges

Some existing structures that span creeks, rivers, roads, utility corridors and abandoned rail corridors, to carry water, sewer, and other utility services might be able to be retrofitted for use as trail bridges. It will be necessary to employ a structural engineer to evaluate the integrity of the existing structure and work with the owner of the structure to see if a shared use is possible.

3.3 Bicycle Storage and Parking

Bicycle parking is one of the most important investments in order to improve and encourage bicycle travel in urban areas. There is little bicycle parking in the Oklahoma City area. More racks are needed throughout the region to meet the needs of traveling bicyclists.

3.3.1 Bicycle Parking Ordinances

Cities throughout the United States have used bicycle parking ordinances as one way to increase the number of bicycle parking spaces. This is highly recommended for local jurisdictions throughout the Oklahoma City region. New parking ordinances should address the following: (examples taken from existing ordinances in Ann Arbor, MI; Madison, WI; Denver, CO; San Francisco City/County, CA)

- Bicycle parking ordinances should clearly indicate how many bicycle parking spaces are required, either as a function of the type of development (retail, office, residential, etc.) or as a standard percentage of the required off-street automobile parking. For example, the City of Denver requires that off-street automobile parking facilities of 20 spaces or more to provide bicycle parking equal to 5% of the automobile parking space requirement.

- Bicycle racks that support the bike by the wheel only should not be permitted.

- Bicycle racks should be located at least as close to the building entrance as the nearest non-handicapped parking stall.

The requirements can also address lighting of bicycle racks, requirements to retrofit existing public buildings, and protection from the elements.

3.3.2 Location Criteria

The location criteria are a mix of those developed by the cities of Denver and Seattle for siting bicycle racks, and are recommended for Oklahoma City area communities:

- Racks should be located within 50’ of building entrances (where bicyclists would naturally transition into pedestrian mode).

- Racks should be installed in a public area within easy viewing distance from a main pedestrian walkway, usually on a wide sidewalk with five or more feet of clear sidewalk space remaining (a minimum of 24" clear space from a parallel wall, and 30" from a perpendicular wall).

- Racks are placed to avoid conflicts with pedestrians. They are usually installed near the curb and at a reasonable distance from building entrances and crosswalks.

- Racks can be installed in bus stops or loading zones only if they do not interfere with boarding or loading patterns and there are no alternative sites. The communities of Phoenix, AZ, Portland, ME and Denver, CO have installed racks on their buses.

3.3.3 Bicycle Rack Design

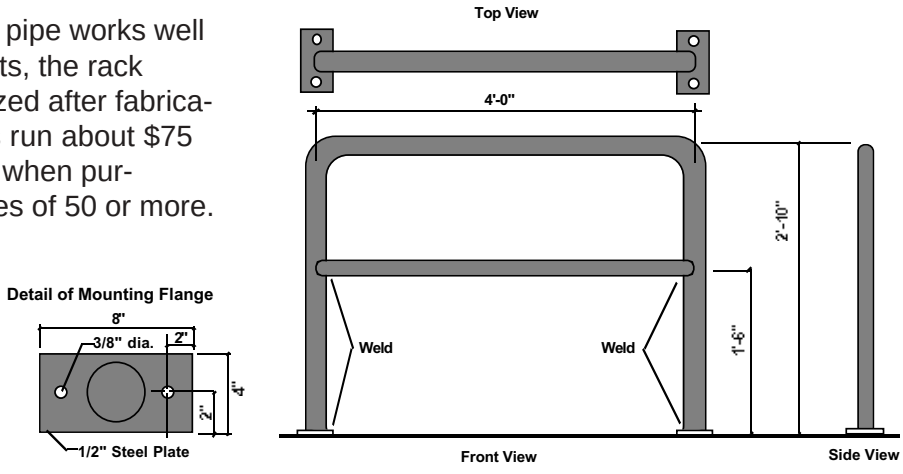
It is important to choose a bicycle rack design that is simple to operate. Bicycle racks should be designed to allow use of a variety of lock types. It may be difficult initially to determine the number of bicycle parking spaces needed: bicycle racks should be situated on-site so that more racks can be added if bicycle usage increases.

There are three general types of bicycle rack designs. The following provides information on each style (derived from the April 1996 issue of Pro Bike News). For a list of bicycle parking manufacturers, see Appendix 3.

Figure 7: An inexpensive bicycle rack design

The design shown has proven popular and effective in numerous communities. It is inexpensive to fabricate locally, easy to install, vandal-resistant, and works well with the popular high-security bicycle locks. In addition, it can be installed as a single unit, on a sidewalk, or in quantity, as at a major recreation center.

Schedule 40 steel pipe works well and, for best results, the rack should be galvanized after fabrication. Typical costs run about $75 per rack installed, when purchased in quantities of 50 or more.



Taken from BFA's *Planning for Bicycling at the Local Level*

Class I Bicycle Parking

This category includes bike lockers or locked/guarded storage areas that provide high-security protection.

Advantages:	Disadvantages
High security storage, ideal for long-term storage.	Expensive

Average cost per bike: $500 - $1500 (1-2 bikes)

Class II Bicycle Parking

This category includes racks that secure both wheels and bicycle frame, which usually have moving parts and provide medium security with a user-supplied lock.

Advantages:	Disadvantages:
Medium security, great when coupled with covered protection from the elements.	Moving parts, complex design, may not work with the common U-lock

Average cost per bike: $65 - $150

Class III Bicycle Parking

The most common type of Class III rack are inverted U s or rail racks.

Advantages:	Disadvantages:
Simple design, affordable, can be manufactured by a local welder. Supports frame as well as wheel.	Offers low-security for long-term parking

Average cost per bike: $65 - $80

3.4 Sidewalk Design Overview

Sidewalks are a critical need throughout the Oklahoma City area. They not only encourage walking, but they also improve the safety of pedestrians. The safety benefits of sidewalks are well-documented: one study found that streets without sidewalks had 2.6 times more pedestrian/automobile collisions than expected on the basis of exposure, while streets with sidewalks on only one side had 1.2 times more pedestrian collisions. (FHWA-RD-88-038, Knoblauch).

3.4.1 Pedestrian Environments

An individual s decision to walk is as much a factor of convenience as it is the perceived quality of the experience. Pedestrian facilities should be designed with the following factors in mind:

- Sufficient width
  Sidewalks should accommodate anticipated volumes based on adjacent land uses, and should at a minimum allow for two adults to walk abreast.

- Protection from traffic
  High volume and/or high speed (>35 mph) motor vehicle traffic creates dangerous and uncomfortable conditions for pedestrians. Physical (and perceptual) separation can be achieved through a combination of methods: a grassy planting strip with trees, a raised planter, bicycle lanes, on-street parallel parking, and others.

- Street trees
  Street trees are an essential element in a high quality pedestrian environment. Not only do they provide shade, they also give a sense of enclosure to the sidewalk environment which enhances the pedestrian s sense of a protected environment.

- Pedestrian-scaled design
  Large highway-scale signage reinforces the general notion that pedestrians are out of place. Signage should be designed to be seen by the pedestrian. Street lighting should likewise be scaled to the level of the pedestrian, instead of providing light poles that are more appropriate on high-speed freeways.

- Continuity
  Pedestrian facilities are often discontinuous, particularly when private developers are not encouraged to link on-site pedestrian facilities to adjacent developments and nearby sidewalks or street corners. New development should be designed to

encourage pedestrian access from nearby streets. Existing gaps in the system should be placed on a prioritized list for new sidewalk construction.

- Clearances
  Vertical clearance above sidewalks for landscaping, trees, signs and similar obstructions should be at least 8'. In commercial areas and the Central Business District (downtown), the vertical clearance for awnings should be 9'. The vertical clearance for building overhangs which cover the majority of the sidewalk should be 12'.

- Conformance with national standards
  Sidewalk design should be consistent with Americans with Disabilities Act requirements and/or ANSI requirements. Specific guidance is provided by the Architectural and Transportation Barriers Compliance Board s American s with Disabilities Act Accessibility Guidelines.

3.4.2 Sidewalk Obstacles

Street furniture and utility poles create obstacles to pedestrian travel when located directly on the sidewalk. At the very minimum there should be 36" of sidewalk width to allow wheelchairs to pass. Where possible, utilities should be relocated so as not to block the sidewalk. Benches should not be sited directly on the sidewalk, but set back at least 3'.

The design of new intersections or re-design of existing intersections presents an opportunity to improve pedestrian circulation. Street furniture located near intersections can block sight lines. In general, the designer should consider the impact on sight distance for all features located in the vicinity of roadway intersections.

3.4.3 Continuity in Construction Zones

Work zone areas can disrupt pedestrian and bicycle circulation, and often create total barriers for pedestrians. Just as traffic is re-routed during roadway construction, pedestrians and bicyclists should be provided a safe alternative through the work zone. If a safe alternative is not provided, they will often try to make their way across the site unprotected.

Pedestrians and bicyclists should be re-routed well in advance of the construction barriers, since most are unlikely to retrace their steps to get around the work zone. The MUTCD provides appropriate signage for these situations, and provides limited guidance for pedestrian detours in Section 6C-9. If a path is to be provided

within the work zone, it should be constructed of a smooth and even surface, with no gaps. Pedestrians should be protected from construction vehicle traffic, roadway traffic and falling debris.

Construction sites are particularly difficult to traverse for disabled pedestrians. An alternate accessible route should always be provided when the main accessible route is interrupted by construction activities.

3.4.4 Sidewalk Pavement Design

Sidewalks and roadside pathways should be constructed of a solid, debris-free surface. Regardless of the type of surface chosen, it must be designed to withstand adequate load requirements. Standard depth of pavement should consider site specific soil conditions, and is therefore left to local discretion. Brick and concrete pavers are popular materials for more decorative sidewalks. The use of stylized surfaces is encouraged, however they must be installed properly or they will deteriorate over time.

3.4.5 Pedestrian Facility Maintenance

Maintenance is an important aspect of creating adequate and comfortable facilities for pedestrians. A crumbling sidewalk is not only an eyesore but a hazard to pedestrians and often a barrier to the disabled. Regular maintenance protects public investment and reduces liability risk.

A periodic inspection schedule for pedestrian facilities should be adopted by local jurisdictions. Crosswalks will need re-striping on a regular schedule, based on the material used in the striping. A general maintenance budget should be allocated by each local government for use on a yearly basis, perhaps combined with a maintenance budget for bicycle facilities.

3.5 Sidewalk Width and Setback Guidelines

The following are recommended guidelines for sidewalk width and setback in the Oklahoma City area. It is important to note that there are some areas that warrant wider sidewalks than the minimum. For example, sidewalks in and around local universities and colleges must accommodate a much higher volume of pedestrians, and therefore warrant additional width. The recommendations below are based upon standards used by other pedestrian-friendly communities in the U.S.

By following the recommendations below, Oklahoma City area communities can ensure that basic needs of pedestrians are addressed in developing areas. In existing residential and commercial areas that lack sidewalks, new sidewalk construction (independent of new development) should occur first in locations that demonstrate the most need.

3.5.1 Sidewalks on local streets in residential areas:

Four foot wide sidewalks are recommended on at least one side of the street, with a 3’ wide planting strip. The planting strip may need to be slightly wider to accommodate the roots of street trees, if they are included in the design. Sidewalks are not necessary on cul-de-sacs that are less than 500’ in total length.

3.5.2 Sidewalks on collector streets in residential and commercial areas:

Four foot wide sidewalks are recommended on both sides of the street. Another option is to install a 6’ wide sidewalk on just one side of the street (in this case, the sidewalk should be installed on the side that generates the most activity). A 5’ wide planting strip is recommended.

3.5.3 Sidewalks on arterial streets in residential and commercial areas:

Five foot wide sidewalks are recommended on both sides of the street, with 8’ wide planting strips.

3.5.4 Sidewalks on streets within 2000' of schools:

Width and setback should be based on the specific roadway type as described above. For all roadway types, however, sidewalks should be installed on both sides of the road, and should include well-marked crosswalks and school crossing signs.

3.5.5 Sidewalks in Central Business Districts:

Sidewalk widths in Central Business Districts are, for the most part, already determined by building setback and street width. Should reconstruction project warrant further study of sidewalk width in a CBD, service standards have been set by AASHTO s Highway Capacity Manual.

3.5.6 Sidewalks on streets with no curb and gutter:

The setback requirements in this section are based on roadway cross sections that include curb and gutter. Sidewalks located immediately adjacent to ribbon pavement (pavement with no curb and gutter) are not recommended. However, if no other solution is possible, sidewalks adjacent to ribbon pavement have a much greater setback requirement, depending on roadway conditions. Engineers should consult the AASHTO Policy on Geometric Design of Highways and Streets for more specific guidelines.

3.5.7 Sidewalks in rural areas:

In most rural areas, the low volume of pedestrians does not warrant sidewalk construction. In most cases, 4' wide paved shoulders can provide an adequate area for pedestrians to walk on rural roadways, while also serving the needs of bicyclists. Exceptions should be made in areas where isolated developments such as schools, ballparks, or housing communities create more pedestrian use. For example, motorists might regularly park along a rural road to access a nearby ballpark. A sidewalk may be warranted in this circumstance so that pedestrians can walk separately from traffic. Sidewalks in rural areas should be provided at a width based on anticipated or real volume of pedestrians, with 4' being the minimum width.

3.6 Intersection Design for Pedestrian Safety

Intersection design is extremely important for the safety of pedestrians. No single feature creates a safe intersection for pedestrians - the design elements described below should be combined as site conditions warrant.

3.6.1 Crosswalks

Marked crosswalks should be provided at intersections that carry significant pedestrian volumes, or where newly installed sidewalks are likely to generate more pedestrian traffic. Crosswalks can serve to channel pedestrian traffic through an intersection, as well as heighten the awareness of motorists of possible pedestrian crossing movements.

It is important to note that although crosswalks are an important element in intersection design, a crosswalk alone does not ensure the safety of a pedestrian. Too often, crosswalks are the sole provision for pedestrians at intersections when other safety measures are also needed.

Chapter 3B-18 of the MUTCD provides guidance on crosswalk design. High visibility designs are recommended for use in the Oklahoma City area (the designs shown on this page offer the highest visibility). A non-skid, long-life striping material is the preferable marking material for bicycle and pedestrian facilities.

The optimum width of crosswalks is 10', with a minimum width (as set by the MUTCD) of 6'. Wider crosswalks should be installed at locations with higher pedestrian volumes. At intersections with stop bars, a minimum separation of 4' is necessary between the stop bar and edge of the crosswalk.

3.6.2 Curb Ramps

A deciding factor in the location and design of crosswalks is the placement of curb ramps at street corners. Curb ramps should always be placed so as to lead the pedestrian directly into a striped crosswalk area. Corners should either include two curb ramps, or one broad ramp that serves both crosswalks. Curb ramps should always be provided with a matching ramp on the opposite side of the road, as well as ramps at pedestrian refuge islands.

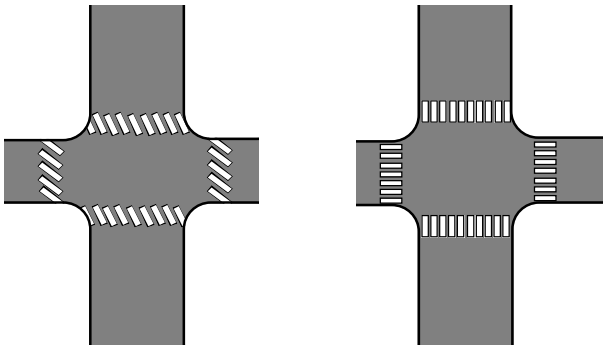


Figure 8:
Two types of high visibility pedestrian crosswalk marking patterns
Source: Manual on Uniform Traffic Control Devices

Both ANSI and ADA provide federal guidance for curb ramp installation, and use of either guideline is acceptable. Current ADA standards state that the slope of curb ramps cannot exceed 1 to 12 (inches), with a maximum rise of 30 inches. If the curb ramp is located in an area where pedestrians might typically walk, it must have flared sides that do not exceed a slope of 1 to 10 inches. It is also extremely important that the bottom of the curb ramp be even with the street surface. A raised lip at the street edge can cause a wheelchair to tip over, even if it is only 1/4 inch high.

3.6.3 Traffic Signals

Pedestrian safety at intersections depends in part on minimizing the length of time that the pedestrian is exposed in the street. One way of minimizing conflict at intersections is to improve the phasing of traffic signals. Traffic signal improvements for pedestrians may include the following provisions:

- Improvements to timing options and turn phasing
- Elimination of right-turn-on-red movements
- Elimination of free-right turning movements (with yield signs)
- Addition of pedestrian signals (walk/don t walk)
- Push-button signals that can be tripped by pedestrians
- Reduced corner radii to shorten the distance the pedestrian must cross, therefore also shortening the signal interval

Extensive guidelines for traffic signalization to accommodate pedestrian crossings are provided in the MUTCD. Traffic engineering analysis is necessary on a case-by-case basis in order to determine the best signal option. Signalized intersection design and audible signals should be given special consideration in areas with higher numbers of senior citizens, school-age children and disabled persons.

3.6.4 On-Street Parking

The presence of parked cars near intersections have been cited as a contributing factor in many pedestrian accidents in urban areas. Parked cars block visual access to oncoming traffic, so that both pedestrians and motor vehicles cannot see each other. Consideration should be given to removing parking in the immediate vicinity of crosswalks. At least two parking bays at a minimum should be removed to provide adequate site distance to the intersection.

3.6.5 Corner Turning Radius

One aspect of intersection design that is often overlooked is the turning radii of corners. A wide turning radius can increase crossing distance, as well as increase the speed of turning traffic. However, a turning radius that is too small can cause

long vehicles (such as flatbed trucks or buses) to jump the curb edge and eventually cause the curb to crumble or possibly hit pedestrians waiting to cross. The optimum design is a compromise between the two, such as a radius of 35 feet.

3.6.6 Medians and Refuge Areas

In general, pedestrians are better accommodated when roadway width at intersections is narrower, thereby making medians unnecessary. Pedestrian refuge areas can be essential for large, multi-lane urban intersections. These islands serve several purposes. They allow a resting area for slower pedestrians who cannot make it across the intersection within the time allotted. In wider urban intersections, refuge areas allow pedestrians to cross one direction of traffic at a time, and provide a place to wait for the next pedestrian cycle. In this case, they also reduce the overall delay to motor vehicles who would otherwise have to stop for an interval that would allow a pedestrian to cross the entire length of the intersection.

Medians and refuge areas can be particularly important for urban intersections with center turn lanes and left turn signals. Traffic signals that serve these intersections often do not allow adequate time for the pedestrian to traverse the length of the intersection. The center median therefore provides a refuge for pedestrians who must wait through several cycles for a clear zone.

Pedestrian refuges are recommended at intersections with crossing distances that cannot be made within the time allotted by the signal phasing (assuming a standard rate of travel at 4’ per second). Refuge areas should also be installed at intersections with crossing distances that exceed 75’, or with a high volume of elderly or disabled pedestrians.

The minimum width for medians should be 4’, with 6’ being a preferred width. The length of the island should be based in part on the geometric design of the approaching traffic lanes, but should not be less than 20’. The design of the island should meet ADA or ANSI standards, with curb cuts provided.

3.7 Special Types of Pedestrian Crossings

3.7.1 Midblock Crossings

In situations where a midblock crossing formalizes a pedestrian activity that is already occurring on a frequent basis, midblock crossing provisions can be used to improve the visibility of the pedestrian. This type of pedestrian activity most often occurs in locations where a high pedestrian traffic generator is located directly across the street from a significant source of pedestrians, such as a fast food restaurant across the street from a university.

However, due to the increased safety risk of a pedestrian crossing in midstream traffic, midblock crossings should be generally discouraged unless one or more of the following conditions apply:

- the location is already a source of a substantial number of pedestrians desiring to cross at midblock, or is anticipated to generate midblock crossings (for new development).

- the land use is such that a pedestrian is highly unlikely to cross the street at an adjacent intersection, and when midblock crossings would be frequent.

- the safety and capacity of adjacent intersections creates a situation where it is dangerous to cross the street, except at a designated midblock location.

- spacing between adjacent signals exceeds 600 feet.

- the vehicular capacity of the facility will not be seriously impeded by the midblock crossing.

- other lesser measures to encourage pedestrians to cross at adjacent intersections have been unsuccessful.

On-street parking can reduce sight distances at midblock crossings. In areas with on-street parking, midblock crossings should include highly visible crosswalk markings and a flared-out curb extension.

Another measure to improve motorist awareness of the midblock crossing is to erect overhead pedestrian crossing signs on span wires or mast arms above the street. In cases of extremely high pedestrian volume during certain times of the day, a signalized intersection with pedestrian push-buttons should be considered.

3.7.2 Grade-Separated Crossings

For essential pedestrian crossings that cannot be accomplished in a safe manner, either due to a high volume of pedestrians or a high volume of motor vehicle traffic, grade-separated crossings should be provided.

Convenience is essential in designing over- and under-passes. Studies have shown that pedestrians can rarely be convinced to use a poorly located crossing and will almost never use an overpass if it takes 50 percent longer to cross than an at-grade crossing. Grade-separated crossings should be provided within the normal path of pedestrians wherever possible. Even for the most ideal overpass location, it may still be necessary to block pedestrian access to the at-grade crossing with fencing.

A 1988 study concluded that state and local governments usually consider grade-separated crossings in the following situations:

- Where there is moderate to high pedestrian demand to cross a freeway or expressway.

- Where there is a large number of young children (i.e., particularly near schools) who must regularly cross a high-speed or high-volume roadway.

- On streets having high vehicle volumes and high pedestrian crossing volumes and where there is an extreme hazard for pedestrians (e. g., on wide streets with high-speed traffic and poor sight distance).

- Where one or more of the conditions stated above exists in conjunction with a well-defined pedestrian origin and destination (e.g., a residential neighborhood across a busy street from a school, a parking structure affiliated with a university, or apartment complex near a shopping mall). (Zegeer and Zegeer: Pedestrians and Traffic-Control Measures, TRB)

It is important to provide adequate lighting of the crossing to prevent crime and vandalism. Underpasses often need lighting 24 hours a day and the illumination level should exceed 1.0 footcandles. Topography should be a major consideration in determining whether an underpass or overpass is more appropriate. These facilities are regulated by ADA and ANSI standards, therefore lengthy ramping is usually necessary to meet the grade requirements.

3.7.3 Expressway Ramps

Pedestrian safety is often jeopardized in areas where expressway ramps intersect with arterial, collector and local streets in the Oklahoma City area. For new

roadways and roadway widening projects, a pedestrian circulation plan should be developed for interchange exit and entrance ramp locations, particularly for areas with the following characteristics:

- areas with substantial pedestrian volume or nearby pedestrian attractors
- where existing sidewalks are located in the vicinity of expressway exits/entrances
- where new sidewalks are planned for the vicinity of expressway exits/entrances
- where regional or local trails are planned

Several measures can increase the awareness of motorists and improve conditions for pedestrians at interchanges. Ramp width should be minimized to reduce the crossing distance for pedestrians. Warning signs should be posted on exit ramps to warn motorists of upcoming pedestrian crossings. Motorists should be encouraged to quickly reduce their vehicle speed after exiting the highway, both through signage and traffic calming methods.

It should be noted that it is difficult to correct all of the problems associated with expressway entrance and exit ramps on local streets. In some cases, these areas will always be unfriendly for pedestrians due to the limiting factors of high speed exiting traffic and poor sight distance. Extra care should be taken to improve these areas for pedestrians wherever possible.

3.8 Bicycle Lanes

Bicycle lanes in Oklahoma City should conform to the standards in AASHTO s Guide for the Development of Bicycle Facilities (1991). Bicycle lanes are an on-road type of facility . They should not be separated from other motor vehicle lanes by curbs, parking lanes, or other obstructions. General standards for width, striping, and intersections are provided below.

3.8.1 Location and Use

Bicycle lanes serve the needs of bicyclists in urban and suburban areas, providing them with their own travel lane. Bicycle lanes are always located on both sides of the road (except when they are constructed on one-way streets). By this design, cyclists are encouraged to follow the rules of the road, which require them to travel in the same direction as adjacent motor vehicle traffic.

Bicycle lanes should be installed on the right-hand side of one-way streets, unless conflicts can be greatly reduced by installing the lane on the left-hand side.

3.8.2 Width

The minimum width of bike lanes should be 4', exclusive of the gutter pan. Gutter pan width is not included in the usable width of the bike lane, since the seam between the pan and the street surface creates a hazard for bicyclists (see cross sections on following page). On roads with parallel parking, bike lanes should be a minimum of 5' wide, and should be installed adjacent to the motor vehicle lanes, rather than between the parking lane and the curb. Along streets in Oklahoma City with higher motor vehicle speeds and traffic volumes, wider bike lanes are recommended.

3.8.3 Pavement Quality

Bike lane pavement and subbase should always have the same depth and quality as the adjacent roadway. Bike lanes are not required to have curb and gutter.

3.8.4 Signage

The MUTCD specifies standard signage for bicycle lanes. According to section 9B-8, the R3-16 sign should be used in advance of the beginning of a designated bicycle lane to call attention to the lane and to the possible presence of bicyclists. The MUTCD requires that

R7-9
12" x 18"

R7-9a
12" x 18"

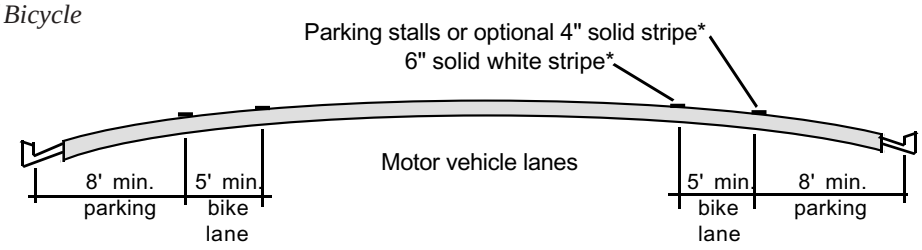
R3-16
24" x 30"

R3-17
24" x 30"

Figure 9:
Bicycle lane signs for different conditions
Source: Manual on Uniform Traffic Control Devices

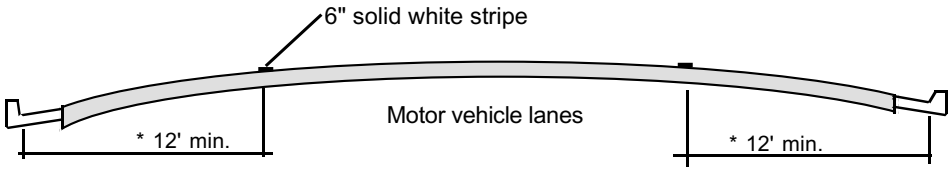
Figure 10:
Bicycle lanes provided under different types of conditions
Source: AASHTO Guide for the Development of Bicycle Facilities

(1) Striped parking



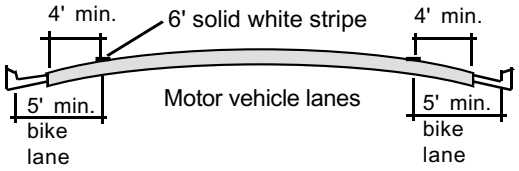
* The optional solid stripe may be advisable where stalls are unnecessary (because parking is light) but there is concern that motorists may misconstrue the bike lane to b e a traffic lane.

(2) Parking permitted without parking stripe or stall

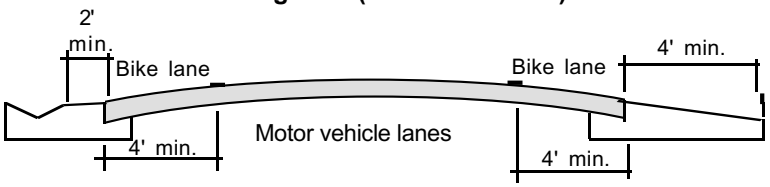


* 13' is recommended where there is substantial parking or turnover of parked cars is high (e.g., commercial areas).

(3) Parking prohibited



(4) Cross section on roads with no curb and gutter (source: NCDOT)



the diamond lane symbol be used with both the R3-16 and R3-17 signs.

According to Section 9B-11 of the MUTCD, the R7-9 or R7-9a signs can be used along streets where motorists are likely to park or frequently pull into the bike lane.

3.8.5 Striping

Bicycle lane stripes should be solid, 6" wide white lines. Care should be taken to use pavement striping that is skid resistant. Bicycle-shaped pavement symbols and directional arrows should be placed in the bicycle lane to clarify its use. Pavement letters that spell ONLY BIKE are also highly recommended. Symbols should be installed at regular intervals, immediately after intersections, and at areas where bicycle lanes begin.

3.8.6 Intersections

Bike lane striping at intersections is challenging. Traffic has a tendency to mix at intersections: motorists who are turning right must cross paths with cyclists who wish to continue straight, and cyclists who wish to turn left must cross into left-hand turn lanes. Several intersection striping patterns are provided by AASHTO s Guide for the Development of Bicycle Facilities (1991) and the MUTCD (see Figure on page 42).

3.8.7 Signal Actuation

Traffic signals that do not respond to bicyclists are a problem throughout Oklahoma City. For new bike lanes, the signal actuation system should be modified to ensure the traffic light will respond to the presence of a bicyclist. See Section 14 for more detailed information on signal actuation.

3.8.8 Maintenance

Regular maintenance is of the utmost importance to the success of a bicycle lane. A bicycle lane that has collected broken glass and debris is rendered useless and is hazardous to bicyclists. Prior to the installation of bicycle lanes in Oklahoma City, it is recommended that the jurisdiction responsible for maintaining the road define a schedule for

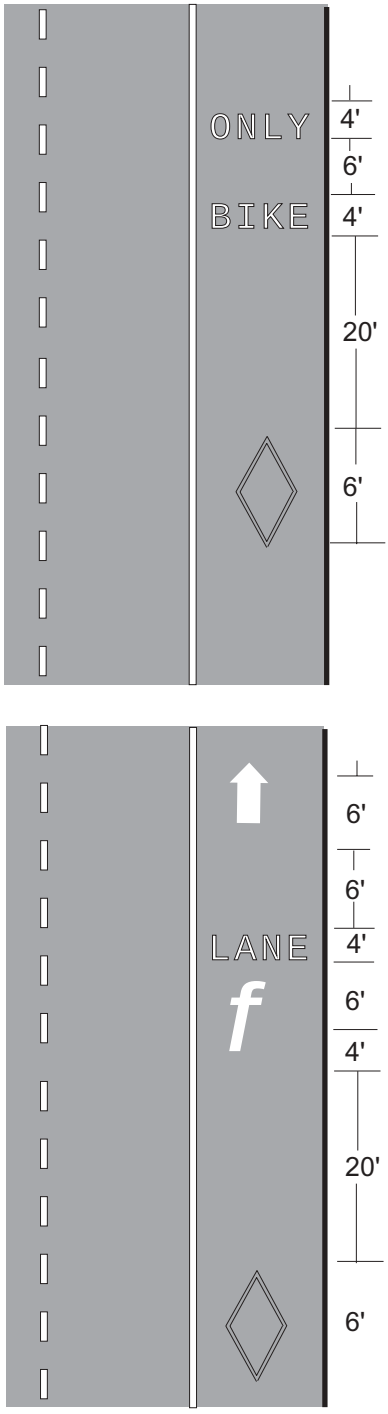


Figure 11:
Word and symbol pavement markings for bicycle lanes
Source: Manual on Uniform Traffic Control Devices

Figure 12:
Typical Signing for
Beginning and Ending of a
Designated Bicycle Lane

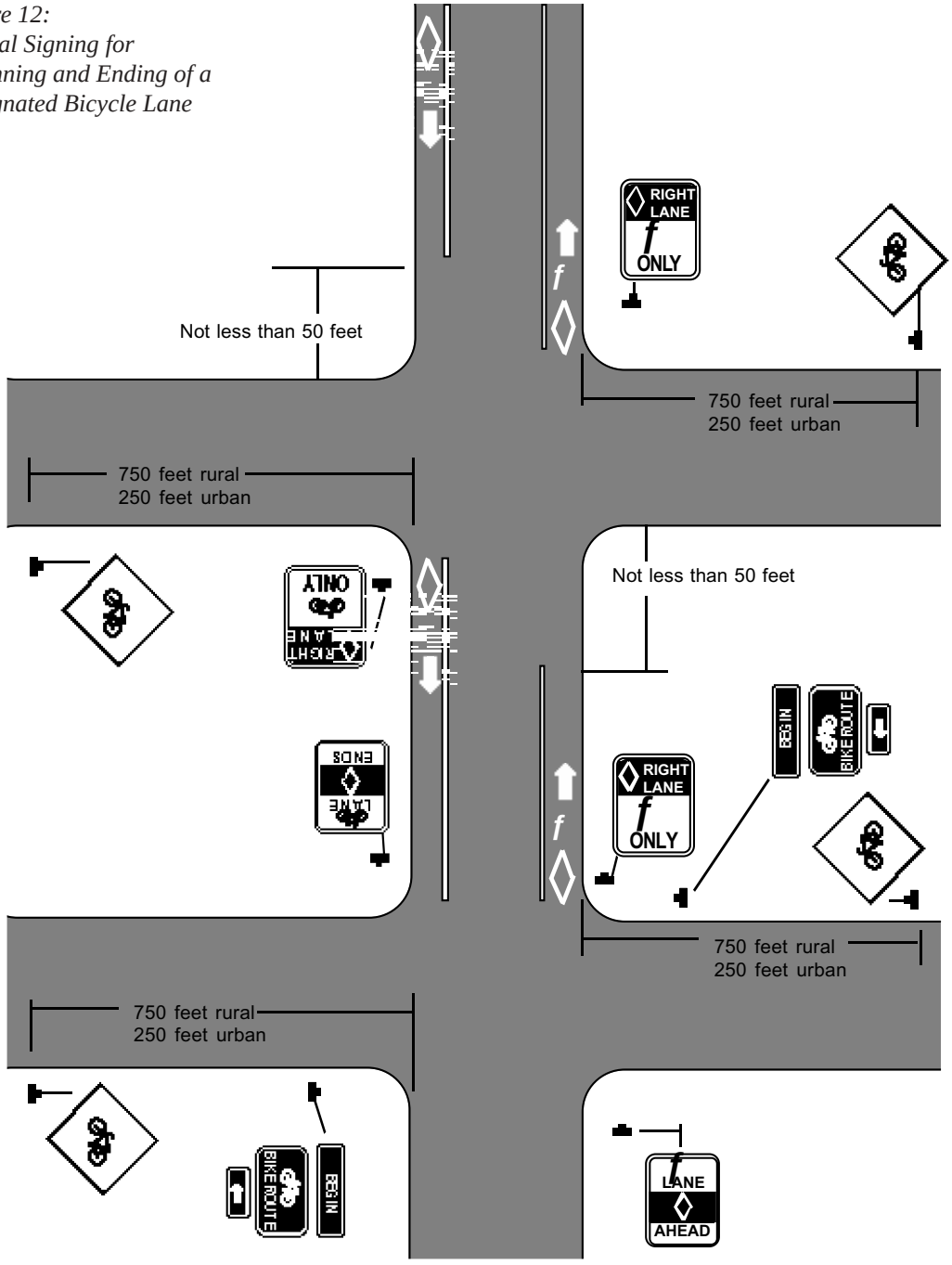
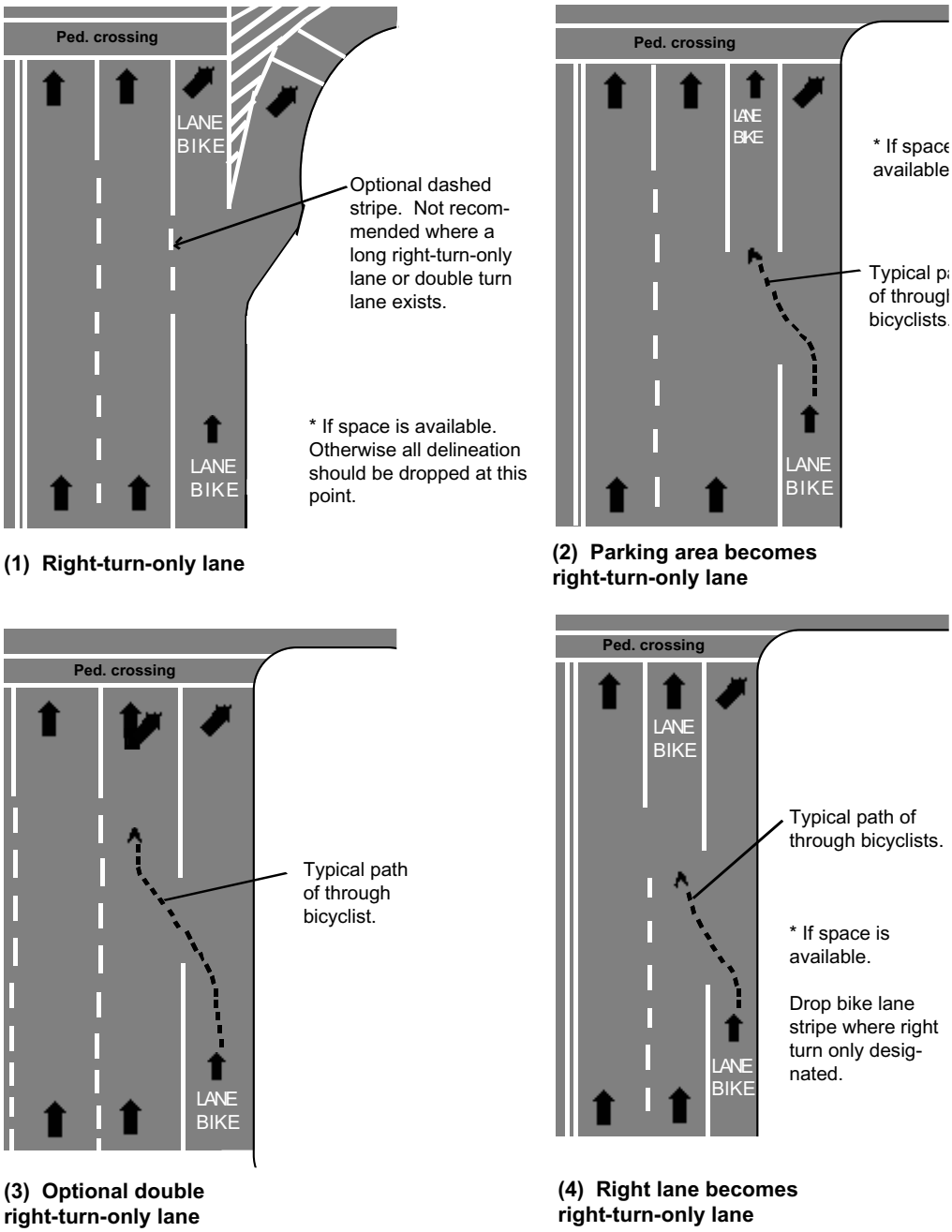


Figure 13:
Bicycle lanes and right turn lanes: 4 options
Source: AASHTO Guide for the Development of Bicycle Facilities

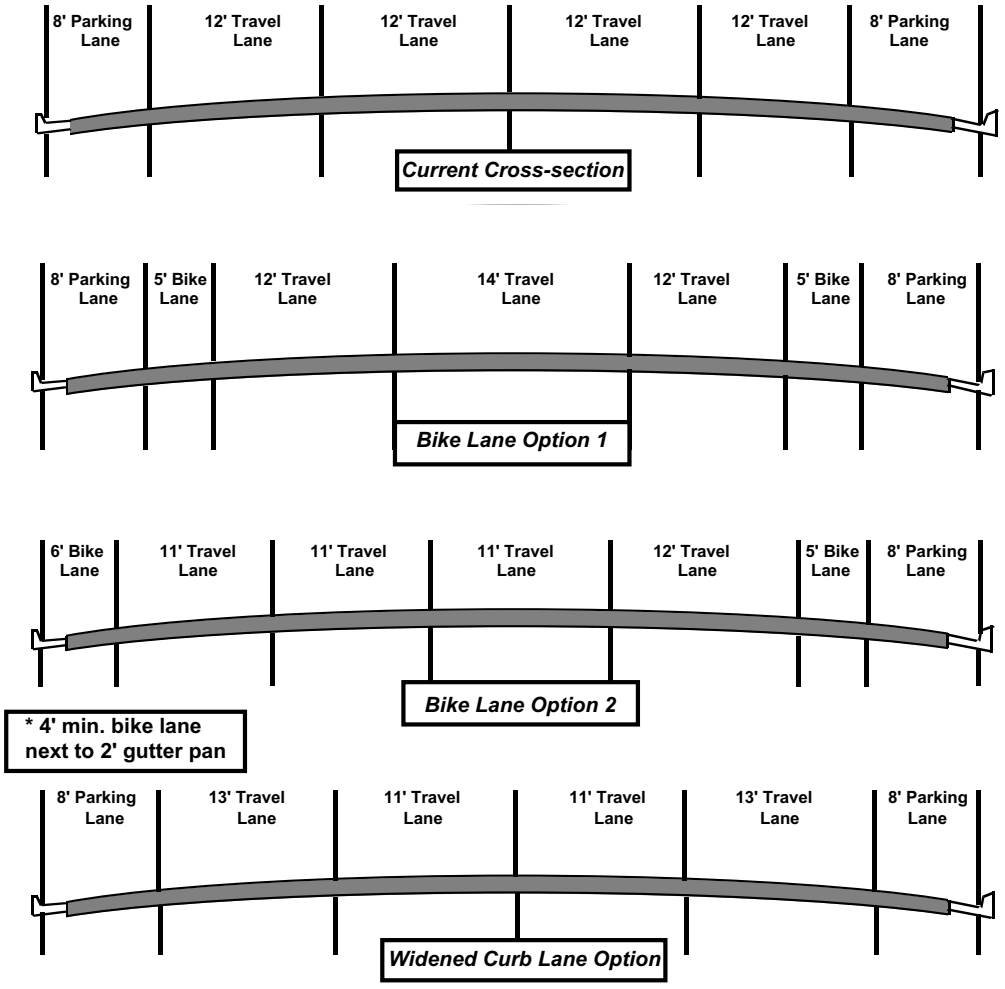


periodic maintenance of the bike lanes. Street sanitation and maintenance workers may need additional instruction in bike lane maintenance. Bike lanes need to be periodically cleaned by street sweepers.

3.8.9 General Design Issues

Minimum traffic volumes: Providing bicycle lanes on very quiet residential streets may not accomplish much. To most bicyclists, the primary benefit of bicycle lanes is to give them space where they feel a lower level of threat from

Figure 14: Bicycle Lane Options



* 14' preferred but parking lane should NOT be narrowed for that purpose

** Narrowing inside travel lanes to 11' on low speed urban roadways is acceptable; in addition, according to the Highway Capacity Manual, it reduces lane capacity by approximately 3%.

passing motor vehicle traffic. If there is little such traffic, the facility may not be seen as serving a purpose.

Complexity: Intersection complexity is an important consideration in designating bicycle lanes. A route with simple 3 or 4 legged intersections can be striped with little difficulty. On the other hand, a route with very complex intersections (e.g., freeway interchanges with on- and off-ramps, major intersections with multiple right turn lanes) will be difficult to stripe and should be reconsidered.

Available space: The spatial needs for installing bicycle lanes are greater than those for wide outside travel lanes. If such space does not currently exist, other options may be possible such as reducing lane widths, removing the parking lane on one side of the street, elimination of a travel lane (given that this does not lower the current level of service for motor vehicles to an unacceptable level), or road widening (see examples below). These methods may enable the designer to achieve a 14' wide outside lane, as a minimum measure to accommodate cyclists.

3.9 Paved Shoulders for Bicycle Use

Paved roadway shoulders are not only an excellent way to accommodate bicycles, they are also beneficial to the motoring public. Paved shoulders eliminate problems caused when the pavement edge begins to deteriorate - therefore extending the life of the road surface and requiring less maintenance. Paved shoulders also provide a breakdown area for motor vehicles.

3.9.1 Location and Use

Paved shoulders for bicycles serve the needs of all types of cyclists in rural areas. In urban areas, paved shoulders may be preferable for advanced cyclists on arterial roadways with high speeds (over 50 mph). Paved shoulders in rural areas have the additional benefit of providing an area for pedestrian use.

3.9.2 Width

Shoulders should be a minimum of 4' wide to accommodate cyclists, depending upon the speed and volume of motor vehicle traffic. Paved shoulders for bicycles can be designed according to the roadway cross sections shown in Section 10 for bicycle lanes, with the exception that no pavement decals or bicycle lane signage is used for paved shoulders.

Although 4' of width is preferable, certainly any additional shoulder width is preferable to none at all. Shoulders that are 2'-3' wide can improve conditions and are recommended in cases where 4' widths cannot be achieved. However, shoulders less than 4' wide should not be designated as bicycle facilities with signage or on official bicycle route maps. Share the Road signs would be acceptable in these locations, as they would serve to warn motorists of the likely presence of bicyclists.

3.9.3 Pavement Quality and Maintenance

As with bicycle lanes, paved shoulders should have the same pavement thickness and subbase as the adjacent roadway, and should be regularly swept and kept free of potholes.

3.9.4 Signage

Paved shoulders can be designated as bikeways by erecting standard bicycle route warning signs, such as those depicted to the right. As described above, Share the Road signs may be installed roads with paved shoulders that are less than 4' in width.

3.9.5 Design Issues

Rumble strips: If a potential route has paved shoulders but they include rumble strips, the desirability of such a road will be substantially reduced. Rumble strips provide an unrideable surface for bicyclists and are considered a hazard by most riders. In such a case, either repaving the shoulders or choosing an alternate route would be preferred solutions.

Unpaved parking lots and access roads: Motorists entering a paved roadway from an unpaved road or parking lot tend to bring gravel onto the pavement. In such a situation, the shoulder may be unrideable. One solution is to pave a sufficient distance into the driveways and access roads to reduce the encroachment of debris onto the shoulder. Alternatively, a road that has few such problems could make a better candidate route.

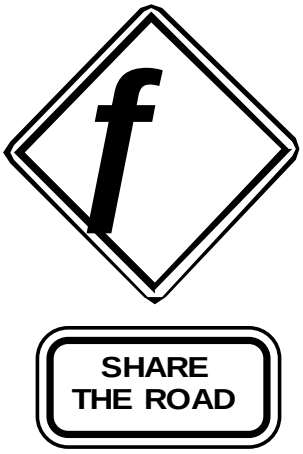


Figure 15:
Share the Road Signage

3.10 Wide Curb Lanes

Outside lanes that are wider than the standard 12’ travel lane can provide more space for cyclists and easier passing for motorists. Under most conditions, automobiles and bicycles can coexist in a 14’ wide curb lane, without the need for the motorist to move into the next adjacent lane. However, motorists will sometimes choose to change lanes, regardless of the additional space.

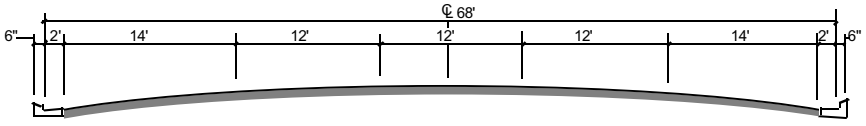
3.10.1 Location and Width

Wide curb lanes best accommodate advanced cyclists, as these riders are more comfortable operating directly in traffic. The wide curb lane is always the furthest right-hand lane, and should optimally be 14’ - 15’ wide, not including the gutter pan (curb lanes that are wider than 15’ are not recommended). Wide curb lanes are not required to have curb and gutter.

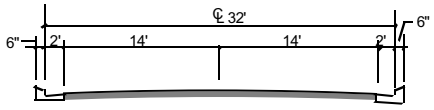
In order to achieve the extra space needed for a 14’ wide outside lane, the roadway may either be physically widened or restriped to reduce the lane width of inner lanes and increase the width of outer lanes. Re-striping proposals should be reviewed by a transportation engineer to ensure adequate safety for the motorists as well as bicyclists.

3.10.2 Signage

There is no special wide curb lane sign, however on high volume urban arterials, the designer may choose to install Share the Road warning signs (standard bicycle warning plate with a subplate stating SHARE THE ROAD).



Five-lane roadway with curb & gutter, standard 12' inside lanes, and widened curb lanes



Two-lane roadway with wide lanes

3.10.3 Intersection Design

When wide curb lanes approach intersections with turning lanes, the 14’ wide lane should continue through the intersection as the outside through-lane.

Figure 16:
Wide curb lanes implemented in two different situations
Source: Bicycle Federation of America

3.10.4 Design Issues

Acceptance: Bicycle programs in numerous communities have found that less experienced bicyclists seldom see a difference when wide curb lanes are provided. Therefore, if the desired outcome is greater numbers of bicyclists or a visible Pro Bicycle statement, this option will not satisfy the need.

Traffic speeds: Wider curb travel lanes may tend to increase motorist speeds. Whether a marginal increase in speeds is important in a particular situation should be a subject for analysis.

Available space: Wide curb lanes can be installed as an interim solution in urban areas where bicycle lanes or paved shoulders cannot be achieved. For these temporary retrofit projects, restriping will likely be necessary to give an outside lane of 14 or 15 feet. If the space is not available, or the only restriping option would cause travel lanes to be narrowed to an unacceptable width, other potential routes should be explored.

3.11 Bicycle Routes

A bicycle route is a suggested way for a cyclist to get from a point of origin to a destination. Bike routes do not necessarily require physical improvements in order to accommodate bicyclists, given that they meet minimum safety criteria in their present condition (see below). Bike routes can be preferable for bicycling for a number of reasons including directness, scenery, less congestion and lower speed limits.

3.11.1 Location and Use

Bicycle routes may be used by all types of cyclists. In urban areas they are most often designated on residential streets with low traffic volumes, and are typically used to direct cyclists to an destination within the community, or to provide a through-route for bicyclists. In rural areas, bike routes are most often designated on roadways that are popular touring routes for recreational cyclists, or long-distance commuting routes for advanced cyclists.

3.11.2 Safety Criteria

A street does not necessary have to be physically widened in order to be designated as a bicycle route. A road with standard 12' wide lanes (or less) can be designated as a bike route with the appropriate signage, given that each condition below is met:

- In its present state (or with planned improvements), the roadway sufficiently accommodates cyclists. The evaluation should take into account roadway width and traffic volumes. Candidate bike routes should have good sight distances and adequate pavement conditions. In addition, traffic should not regularly exceed posted speed limits.

- All bicycle hazards have been removed from the roadway or otherwise remedied, including unsafe drainage grates and angled railroad crossings.

- The bicycle route is designated as one segment within an interconnected system of bicycle facilities.

3.11.3 Signage

Bicycle route signage should be used according to the standards in the MUTCD, which provides several choices in styles.

D11-1
24"x18"

D1-1b(L)
24"x6"

Figure 17: Bike Route Signage

Bicycle route signs should be placed at all areas where new traffic enters the roadway. The distance between signs should not be greater than two miles. In urban areas, it is helpful to include directional arrows and captions that indicate nearby destinations, particularly at intersections.

3.11.4 Bike Routes in Transitional Areas

Local governments will, in many circumstances, be faced with bike lane or paved shoulder facilities that terminate before they reach certain destination points. If conditions at these termini do not meet the safety standards listed above, bike route signs are not recommended. A more appropriate solution would be to install Share the Road warning signs along the connecting routes, as a warning to motorists that bicyclists are likely to use these streets.

3.12 General Roadway Improvements for Bicycles

3.12.1 Responsive Traffic Signals

It is highly recommended that new on-road bicycle facilities in Oklahoma City include traffic signals that detect bicycles for all actuated signal systems. The *Traffic Detector Handbook* (FHWA-IP-90-002) recommends several bicycle sensitive loop configurations (loops are wires installed beneath the pavement surface that detect the presence of vehicles) that effectively detect bicycles. The quadrupole loop (see figure shown on this page) is the preferred solution for bike lanes, and the diagonal quadrupole is preferred for use in shared lanes.

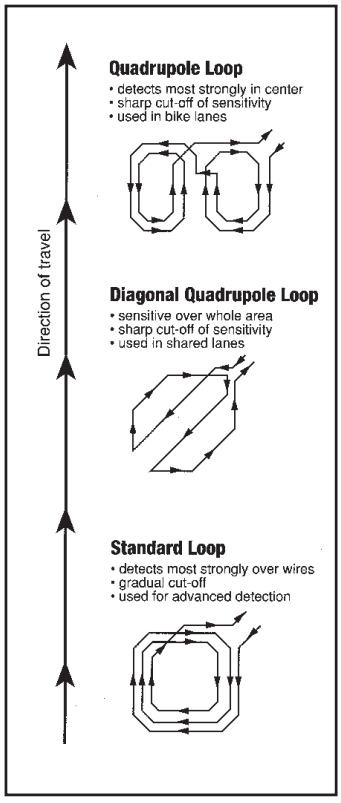


Figure 18:
Traffic Detector loops
Source: Traffic Detector Handbook/NCDOT

One solution for existing intersection signals in Oklahoma City that do not respond to bicycles is to install a special pavement marking over the exact spot that a bicycle must stand in order to trip the signal. The figure shown on the following page shows the pavement marking that is recommended for use under these circumstances.

Further guidance on modifications to traffic signals to detect bicycles is provided in an FHWA publication due to be released in 1996 entitled *Planning for Bicycling at the Local Level*. The draft edition of this manual provides the following guidance in determining the proper solution to unresponsive traffic signals:

Type of route	Existing loop	Solution Options
Street w/ bike lanes	Rectangular in travel lane	°Add quadrupole loop in bike lane °Change to pretimed °Mark sensitive location (if it exists within the bike lane)
Shared lane street	Rectangular	°Replace with diagonal quad. °Mark loop w/ pavement marking (if it can be adjusted to detect bikes) °Add small loop in proper location and mark with pavement marking °Change to pre-timed

Type of route, cont'd	Existing loop	Solution Options
Street w/ right turn lane	Rectangular in through lane	°Replace with diagonal quadrupole in through lane °Mark loop with pavement marking (if it can be adjusted to detect bikes) °Add small loop in proper location and mark with pavement marking °Change to pre-timed
Street w/left-turn lane	Rectangular in left-turn lane	¥Replace with diagonal quadrupole ¥Mark loop with pavement marking (if it can be adjusted to detect bikes) ¥Add small loop in right side of left-turn lane and mark with pavement marking ¥Change to pre-timed

3.12.2 Surface Irregularities

Every effort should be made to provide a smooth and even surface for bicycles, particularly for designated bicycle routes and bicycle lanes. Bicycles are much more vulnerable to surface irregularities than motor vehicles, because they rely on very narrow, highly pressurized wheels with no suspension. A simple pothole that might cause a slight jarring to the passengers of a car can cause a serious crash for a cyclist.

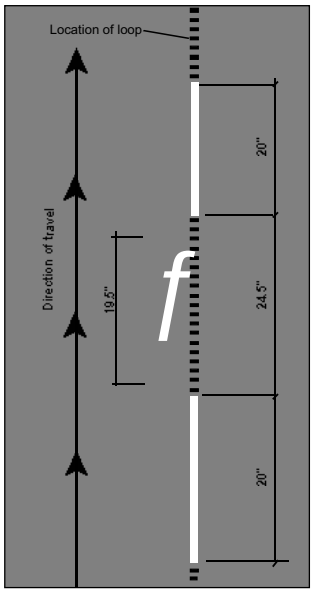


***Figure 19**: Pavement marking that can help to identify the spot along the loop detector that is most sensitive to bicycles Source: Bicycle Federation of America*

Potholes aren t the only surface hazard for bicyclists. Bumps, corrugations, seams, rumble strips, unraveled pavement, and bridge expansion joints can cause bicyclists to lose their balance. In addition, temporary roadway construction zones often include surface hazards such as milled pavement and sudden pavement changes. Temporary signage can be used to warn bicyclists of upcoming irregularities.

When paved shoulders or bicycle lanes are added to the edge of the existing roadway, a resulting seam between the two can be hazardous to bicyclists. One solution is to install 10' wide strips of asphalt, partially overlapping the existing motor vehicle lanes.

3.12.3 Railroad Crossings

On diagonal railroad crossings, the gap next to the rail (called the flangeway) can trap a bike s front wheel causing it to divert. The end result is a quick fall for the bicyclist. This problem is most serious when the track crosses at an angle less than 45 degrees to the direction of travel.

There are two primary solutions to this problem: 1) provide a way for bicyclists to approach the track at an angle close to 90 degrees; or 2) fill the flangeway with a rubberized material.

The first approach can best be accomplished by flaring out the roadway as shown in the diagram on this page. In this way, the bicyclist can cross at a right angle without swerving into the path of passing motor vehicle traffic.

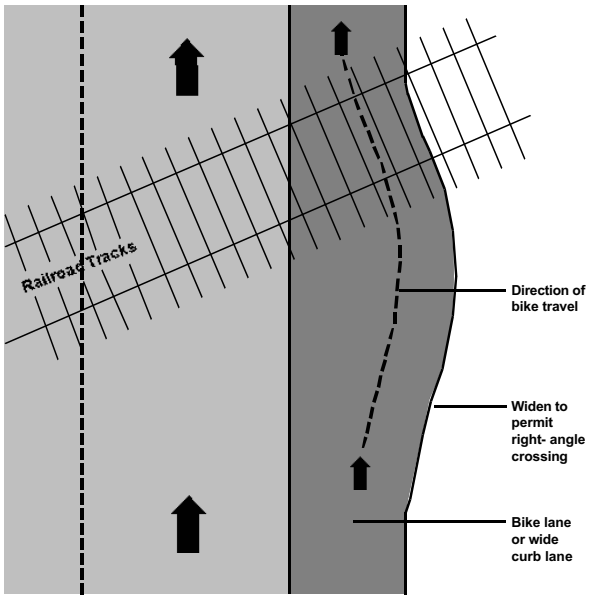


***Figure 20**: Flared roadway permits bicyclists to cross angled railroad crossings at or near 90 degrees.*

The second approach, installing a flangeway fill, works only on very low speed rail lines (e.g., in an industrial yard), since the train must be moving slowly enough to compress the dense fill material.

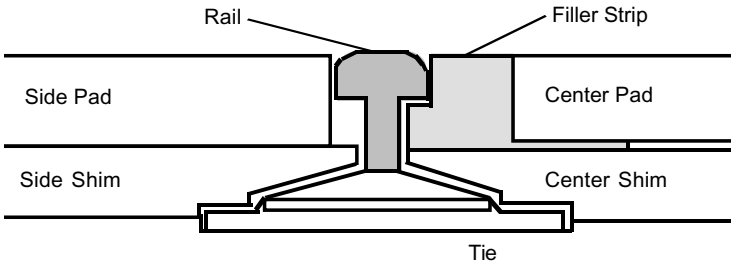


***Figure 21**: Cross section of rubberized railroad crossing with flangeway filler strip for low-speed angle crossings. Source: NCDOT*

3.12.4 Roadway Bridge Design to Accommodate Bicycles and Pedestrians

For new bridges where bicycle and pedestrian traffic is anticipated, adequate space for pedestrians and bicycles should be provided. Minimum accommodations should include a 5' wide sidewalk and a 4' paved shoulder on each side. These guidelines should apply both to new bridge projects and to bridge improvement projects (regardless of whether bicycle lanes or sidewalks connect to the bridge at the time it is built), except for those on limited access freeways, such as interstate highway traffic lanes.

It is also important to provide paved shoulders and sidewalks to the above dimensions where roadways pass under bridges, so that these areas do not present a barrier to pedestrians, cyclists and other persons not in motor vehicles.

There are two main bicycle hazards on bridges: expansion joints and metal grate bridge decks. Some bridge expansion joints are uneven and can cause wheel damage when bicyclists pass over them. One solution is to use a rubber-filled joint system. Another is to cover the joint with a beveled and textured steel plate and weld it to one side on the joint (to allow for bridge expansion and contraction).

Steel honeycomb bridge deck designs can cause bicyclists difficulty in controlling their bicycles. Using a more suitable deck material (e.g. concrete) is the preferable solution to this problem. If such an approach is not feasible, it may be possible to fill the voids with concrete, particularly near the right edge of the roadway. This approach has been used on several key bicycling bridge connections in Seattle, for instance.

In special situations, it may be necessary to construct a physical barrier between pedestrian traffic and motor vehicle traffic on bridges. An engineering analysis of cost effectiveness and need should be conducted prior to choosing this option, due to the extreme cost of construction and long-term maintenance. The Institute of Transportation Engineers is currently developing criteria for evaluating possible barrier sites in their manual *Design of Pedestrian Facilities*. This manual will provide more detail on the design and installation of barriers.

In areas where a barrier is warranted, the safety benefits to pedestrians can be substantial. It is important to note, however, that curbs do not qualify as adequate barriers. Except when traveling at very low speeds, motor vehicles can easily mount curbs and hit pedestrians.

3.12.5 Manhole/Utility covers

Manholes that are lower or higher than the surrounding pavement create a serious hazard to cyclists. This sometimes occurs during roadway resurfacing when a manhole is not raised to the new surface level. Local roadway engineers should develop specific design solutions to address the need for a level pavement surface, including raising manholes to meet the same grade as newly laid pavement. One example is shown on this page.

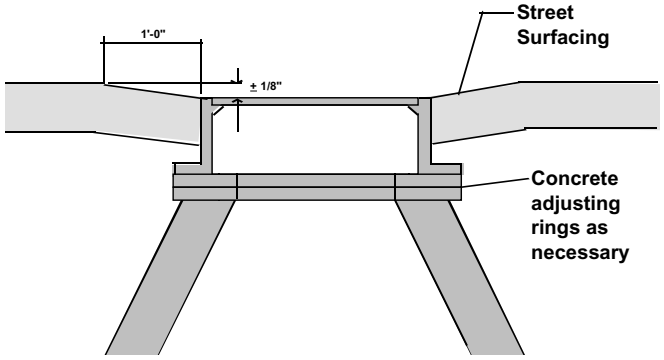


Figure 21:
Standard height adjustment for storm sewer cover solves a problem for bicyclists
Source: Montana Public Works

3.12.6 Bicycle-Safe Drainage Grates

Where located out of the travel lane, the current solid-cover drain inlet found on many streets does not represent a significant hazard to bicyclists. However, where these structures extend beyond the edge of curb, they create a dangerous barrier that can cause a cyclist to crash. In addition, on streets where parallel bar grates are used, they also represent a hazard. These grates can catch a bicyclist s front wheel, causing him or her to catapult over the handlebars.

Where new construction is planned, or where existing hazardous drain inlets are to be improved, bicycle-safe drainage grates should be installed. Several drainage grates have been designed specifically for this purpose the design shown on this page also functions well during peak storm water flow.

It is also important that drainage grates be placed on an even grade with the surrounding pavement. Some drainage grates are recessed below the surface because of roadway resurfacing. These create a special hazard for bicycles and should be made level in the future.

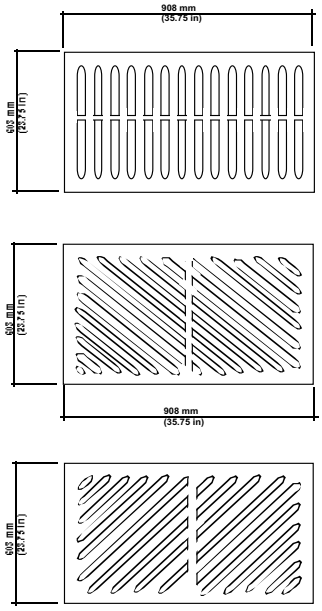


Figure 32: *Several styles of drainage grates that do not trap bicycle wheels*

Appendices

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American Association of State Highway and Transportation Officials, A Policy on Geometric Design of Highways and Streets, Washington, D. C., 1990.

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Appleyard, Donald. Livable Streets. University of California Press, 1981.

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Knoblauch, Richard L., et al. Investigation of Exposure Based Pedestrian Areas: Crosswalks, Sidewalks, Local Streets and Major Arterials. Report No. FHWA/RD-88/038. FHWA,1988.

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U.S. Department of Transportation Federal Highway Administration. Manual on Uniform Traffic Control Devices for Streets and Highways. Washington, D.C., 1988.

U.S. Department of Transportation Federal Highway Administration. Traffic Calming, Auto Restricted Zones, and Other Traffic Management Techniques: Their Effect on Bicyclists and Pedestrians. Clark, Andy and Michail Dornfeld, FHWA-PD-93-028, 1994.

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U.S. Department of Transportation Federal Highway Administration. Selecting Roadway Design Treatments to Accommodate Bicycles, FHWA-RD-92-073, W.C. Wilkinson III, A. Clarke, B. Efferson, R. Knoblauch, 1994.

U.S. Department of Transportation Federal Highway Administration. Traffic Detector Handbook, FHWA-IP-90-002, 1994.

Zegeer, C. V. and Zegeer, S. F. Pedestrians and Traffic-Control Measures. Synthesis of Highway Practice No. 139, Transportation Research Board, 1988.

Appendix 2: Sources of Additional Information

Bicycle/Pedestrian Federation of America
1506 21st NW, Suite 200
Washington, DC 20036
(202) 463-6622

Rails-to-Trails Conservancy
1400 Sixteenth Street, NW
Suite 300
Washington, DC 20036
(202) 797-5400

National Bicycle and Pedestrian Clearinghouse
1-800-760-6272

National Transportation Enhancement Clearinghouse
(202) 463-0641

FHWA Bicycle Program Manager
USDOT Federal Highway Administration
(202) 366-5007

League of American Cyclists
190 W. Ostend Street, Suite 120
Baltimore, MD 21230-3755
(410) 539-3399

APBP - Association of Pedestrian and Bicycle Professionals
1506 21st Street NW, Suite 200
Washington, DC 20036
(202) 463-6622

RTCA - Rivers, Trails, and Conservation Assistance Program
Southeast Region
National Park Service
75 Spring Street, SW
Atlanta, GA 30303
(404) 331-5838

American Association of State Highway and Transportation Officials
444 N. Capitol St. NW, Suite 249
Washington, DC 20001

Sources of Bike/Ped/Greenway Information on the World Wide Web

USDOT Bureau of Transportation Statistics
Address: http://www.bts.gov.

Chainguard
Address: http://www.geopages.com/CapitalHill/1399/

Greenways
Address: http://www.greenways.com.

ITE - Institute of Transportation Engineers
Address: http://www.io.com/~itehq/index.htm

Transportation Research Board
Address: http://www.nas.edu/trb.html

League of American Cyclists
Address: http://www.clark.net/pub/league/homepage.ht

Appendix 3: Bicycle Parking Manufacturers

Class I Bike Lockers

American Bicycle Security
Tom E. Volk
PO Box 7359
Ventura, CA 93006
(805) 933-3688/(800) 245-3723

G.F. Structures Corp.
Steve Salemi
4655-59 W. Arthington St.
Chicago, IL 60644
(312) 626-4122

Creative Pipe, Inc.
Stephanie Pappas
2632 SW Sherwood Dr.
Portland, OR 97201
(800) 644-8467

Cycle-Safe, Inc.
Richard Hartger
478 Arrowhead SE
Grand Rapids, MI 49546
(616) 954-9977

Graber USA
Robert A. Fortune
5253 Verona Rd.
Madison, WI 53711
(608) 274-6550/(800) 783-7257

Lokr Systems
Bonnie Marty
910 Nelson Lane
Lincoln, CA 95648
(916) 645-9174

Raannd Systems Limited
Bob Laidlaw
4 Young Square
Brucefield Industrial Park
Livingston, Scotland EH54 9BJ
0506-415151

Function First Bike Security
Bob O Donnell
PO Box 44137
Tucson, AZ 85733-4137
(602) 322-9626

Super Secur Mfg. Co.
Tom Sasanella
3, Church Circle
Annapolis, MD 21401
(800) 544-7529

Bike Lokr Co.
George Landreth
PO Box 720005
Norman, OK 73070
(405) 360-6644

Exterior Systems
Richard Gerstel
PO Box 10545
Phoenix, AZ 85064
(602) 941-0087

Class II Medium Security

American Bicycle-Security
Lokr Systems
Super Secur
Cycle-Safe
Graber USA
GF Structures
Creative Pipe
Palmer Group
1072 Folsom, Suite 328
San Francisco, CA 94103
(415) 985-7128

ARC Products, Inc.
Neely Kountze
1755 East Locust Street
Omaha, NE 68110
(800) LOCcycl/ (402) 345-0042

Bike Tracks, Inc.
Gerry Hawkes
RFD #1, Box 247
Woodstock, VT 05091
(802) 457-3275

Class III Bike Racks

American Bicycle-Security
Lokr Systems
Super Secur
Cycle-Safe
Graber USA
GF Structures
Creative Pipe
Bike Track, Inc.
Madrax, Inc.

Tom Graber
2210 Pinehurst Drive
Middleton, WI 53562
(800) 448-7931

CORA Bike Rack Inc.
Steve Shadley
PO Box 1647
Bellingham, WA 98277-1647
(800) 354-8624

Bicycle Parking Foundation
John Dowlin
PO Box 7342
Philadelphia, PA 19101
(215) 222-1253

Sunshine U-Lok Corp
Doug Devine
PO Box 7536
Thousand Oak, CA 91359
(818) 707-0110

Urban Accessories/Spectrum
Lisa DeVries
6606 Shady Grove
Columbia, MD 21044
(206) 568-3033

Chapter Four
Description of Proposed Trail System

4.0 Overview

This report, as a component of the Oklahoma City Trails Master Plan, provides detailed descriptions of the specific corridors that have emerged from this study as the most appropriate routes for trail development. These corridors were selected based on their feasibility as trail routes and their location as components of a community-wide trail system. This system will provide access to Oklahoma City's significant outdoor resources, local and regional parks, neighborhoods, commercial and retail activity areas, employment centers, local schools and colleges and the downtown area.

Working closely with local citizens, the Oklahoma City Planning Department and the Oklahoma City Trails Steering Committee, the consultant team has identified 28 corridors throughout the city. The following text thoroughly describes each corridor and the origins and destinations that would be served by its future development. The letters correspond to the letters shown on the map on the last page of the report, and the routes are not listed in priority order.

Although the term "trail" is used frequently in this report, the specific facility constructed within a potential corridor may or may not be an off-road trail. The corridors have not been studied in depth by the consultant team to determine what type of facility (whether it be a trail, sidewalk, bicycle lane, or a combination) should be developed. A site-specific evaluation of each corridor should be completed before a specific route or facility type is selected. Citizen input and comments will be sought during the evaluation of corridors.

4.1 Corridor Descriptions

A. Portland Avenue Trail

Throughout Oklahoma City, several roadway corridors have been identified as potential routes for bicycle and pedestrian facility development. The ample rights-of-way and medians along these roadways may provide opportunities for adjacent trail development, allowing bicyclists and pedestrians access to the destinations along a transportation corridor while providing a facility separated from automobile traffic. Portland Avenue is planned to be widened to a 4 lane State highway from the Kilpatrick Turnpike north to the boundary of Oklahoma City. In conjunction with this roadway widening project a bicycle and pedestrian trail should be considered, but a trail project could become part of a roadway corridor preservation strategy as well. Ample rights-of-way along Portland Avenue could provide a trail that would link the Turnpike Trail to a rapidly developing rural area.

B. Turnpike Trail

This corridor will serve as a connection between two important recreation areas, Lake Arcadia and Lake Hefner, while traveling through residential and commercial areas in between. The Turnpike Trail will also function as an alternative transportation facility which residents of northern Oklahoma City will be able to use to access the lakes as well as retail centers, such as Quail Springs Mall and other centers. This trail could be developed adjacent to the toll way within wide rights-of-way and may require the relocation of controlled access fencing. This corridor is ideal for both typical paved trails and "natural surface" trails due to the existing local natural environment. The turnpike corridor to the west of MacArthur can also be an opportunity for trail development.

C. Deep Fork/Lake Arcadia Greenway

Deep Fork Creek is one of Oklahoma City's hidden treasures. A trail route along this heavily vegetated, natural stream corridor, traveling east through rural areas to connect with Lake Arcadia, could become one of the region's most popular recreational trail facilities. An added bonus of this greenway trail would be the environmental benefits provided by a strip of undeveloped land along Deep Fork Creek that would help control erosion and reduce the amount of pollutants seeping into the waterway. Destinations along this corridor include Expressway Air Park, Lake Aluma, Remington Park, and Oakdale School. This corridor is ideal for both typical paved trails and "natural surface" trails due to the existing local natural environment.

D. Lake Hefner Trail

Although a limited number of trails for walking, jogging, rollerblading and bicycling exist at Lake Hefner, they are heavily used. Due to the demands of local

citizens, money has been earmarked for use in further trail development at the lake. The Lake Hefner Trail will be a circular trail around the lake which will connect to the recreational areas at Lake Hefner, while providing access to the overall trail system. A section of the trail will be the existing on-road bicycle lane along Dam Road.

A bicyclist rides in the bicycle lane at Lake Hefner

This corridor will become a popular facility, linking several residential areas, including The Greens and Quail Creek, to Lake Hefner Golf Course and a number of parks and retail centers. These include Stars and Stripes Park, Lake Shore Estates Park, Hatchery Park, Regional Park, Pat Murphy Park, and various shopping centers.

E. Hefner/Overholser Trail

This corridor will serve as a needed connection in the trail system between two popular recreation areas, Lakes Hefner and Overholser, and the Stinchcomb Wildlife Area. Several retail areas and Wiley Post Airport will be accessible from the corridor, allowing, for example, professionals a chance to bicycle to the airport from their motels and homes. McFarland Park and Hefner Middle School could also be reached by trail users. The shopping areas along this route include Rockwell Plaza, Northwest Plaza, Pepper Tree Square, Springbrook Plaza, Springbrook Shopping Center, Lake Shore Shopping Center and Courtyard Plaza.

The Hefner/Overholser Trail roughly follows the alignment of a canal, which is managed by the Oklahoma City Water Utilities Trust. However, the permanent location of any trail facility should be selected based upon a site-specific evaluation and land availability.

F. Nichols Hills Trail

The Nichols Hills Trail will form the northwest portion of the inner corridor loop around the center of Oklahoma City, thereby connecting Nichols Hills with the overall trail system. This corridor will be developed along Grand Boulevard and will provide a linkage to Lake Hefner. The Nichols Hills Trail is an excellent example of a facility that will allow residents an alternative to getting in their cars and driving to a shopping area that is a short distance away. With the construction of this trail, residents will be able to feel comfortable about choosing to bicycle or walk to complete their daily errands.

Facilities and destinations that could be accessed from the corridor include Nichols Hills City Hall, Oklahoma City Golf and Country Club, Mayview Park, and several retail areas including Amherst Square Shopping Center, Nichols Hills Plaza, Grand Plaza and Lakeside Shopping Center.

A view of eastern Deep Fork Creek

G. Broadway Extension Trail

In the next 10 to 20 years, Broadway Extension will be upgraded to handle the increased volume of traffic between Oklahoma City and Edmond. This corridor is the primary link between the two cities and is highly urbanized. A trail constructed in conjunction with the road widening would link numerous business destinations as well as provide a primary bicycle and pedestrian linkage between Oklahoma City and Edmond. Rights of way may be limited for trail development, however a trail in this corridor could be constructed to provide a direct link between these cities. One area of particular concern is a safe grade separated crossing of I-44, which will be crucial to a successful trail in this corridor.

H. Deep Fork Greenway

The Deep Fork Greenway would be the western extension of the Deep Fork/ Lake Arcadia Greenway. It would serve as an important connection to local facilities and destinations, including Bishop McGuinness School, Topping Park and office complexes such as Central Park. The National Cowboy Hall of Fame and Remington Park Race Track, both important tourist destinations, could also be accessed from the corridor. The Santa Fe railroad right-of-way might also provide access to the greenway, potentially as a natural surface (dirt) trail.

The trail would be located along the banks of the Deep Fork as it flows through this more urbanized area, where it has steep banks and some erosion problems. These issues should be addressed during the design phase. The high bridges over the Creek could provide ample clearance for trail development. This corridor is ideal for both typical paved trails and "natural surface" trails due to the existing local natural environment.

I. Lake Overholser Trail

The Lake Overholser Trail will be similar to the Lake Hefner Trail. Limited trail development has already occurred at this popular recreation site, and land is available for a trail and bike route system that will encircle the lake. This corridor

will provide Bethany and other nearby neighborhoods access to Lake Overholser Park, Putnam City West High, and Mayfield Middle School. A scenic isthmus (a unique, narrow strip of land flanked by trees) linked to bridges at each end could be part of the trail corridor along the east side of the lake.

J. West I-44 Trail

The West I-44 Trail represents the western section of the inner loop of the trail system and links Lake Hefner to the North Canadian River. This corridor will utilize wide right-of-way along a frontage road to the west of I-44. It could directly link many residential areas to parks, shopping areas and medical facilities. Some destinations along this corridor include Will Rogers Park, St. Clair Park, State Fairgrounds, OSU in OKC, Police and Fire Training Centers, Portland Plaza, Coronado Square Shopping Center, Baptist Medical Center, Deaconess Hospital and Madison School. This linkage is a remnant of Grand Boulevard.

K. 19th Street Link

Access to the downtown area is critical in development of a successful trail system for Oklahoma City. The 19th Street Trail is one of several linkages recommended as sidewalk/bikeway connections into the downtown area. This corridor will provide a western connection toward downtown Oklahoma City from the West I-44 Trail, and access to the I-44 Trail from residential areas. Nineteenth Street contains a wide median strip with ample space for sidewalks, and relatively low traffic provides a viable on- street bikeway option. Adjacent residents will be able to use the corridor to access Oklahoma City University, Taft Stadium and Sheperd Mall, three popular destinations. The corridor also connects to Wayman Park, Denniston Park, Rosary School, Gatewood School, Hawthorne School and Taft Junior High School.

Wide medians provide excellent opportunities for trail development

L. Lincoln Robinson Link

This corridor would link the Deep Fork Trail and the northern section of Oklahoma City with the downtown area and North Canadian River. A trail could utilize parks and the ample right-of-way and tree-lined medians of Lincoln Boulevard, as well as Robinson Avenue and Shartel Avenue. The trail could pass through neighborhoods listed on the National Register of Historic Places and residents of these historic and other neighborhoods will be invited to participate in trail plans affecting their streets, parks and schools. The facilities and destinations along this corridor include Presbyterian Hospital, the Oklahoma Medical Center, Edgemere

The Katy Trail would utilize an abandoned railroad corridor

School, Shartel Plaza, Bishop McGuiness High School, and the area surrounding the State Capitol which includes the Jim Thorpe Building, State Historic Museum and Governor's Mansion. Several parks are also accessible from this corridor. Some are Douglas Park, Crown Heights Park, Edgemere Park, Sparrow Park, Goodholm Park, Harn Garden Park, Winans Park, Irving Park, Foster Center and Stiles Park.

M. Katy Trail

Another exciting trail opportunity in Oklahoma City that would serve the recreation, transportation and economic interests of the community is the abandoned railroad corridor in the eastern part of the city. This corridor, which is currently owned by the City's COTPA Trust, extends from Deep Fork Creek to Washington Park near Bricktown. Rail-trail corridors are the fastest growing off-road trail type in the nation. Since 1985, more than 10,000 miles of abandoned railroad corridors have been converted into successful trails in rural, suburban and urban landscapes.

An important aspect of this corridor is its ability to improve non-motorized mobility between important tourist destinations. This will allow tourists to enjoy some of the amenities that the City has to offer, without forcing them to drive from place to place. The facilities and destinations that could be accessed from this corridor include the Kirkpatrick Center, Douglass Park, the Oklahoma City Zoo, and the National Softball Hall of Fame, as well as Edwards School, Creston Hills School, Edwards Park, Creston Hills Park, Harden Park, Lincoln Park, Northeast Lake and Lincoln Golf Course. This corridor is ideal for both typical paved trails and "natural surface" trails due to the existing local natural environment.

N. Bricktown Canal Trail

The Bricktown Canal Trail will provide a bicycle and pedestrian linkage between the North Canadian River and Bricktown. It can be a part of a commuter's route into Downtown. The Bricktown Canal Trail is in the planning stages and will receive funding as a MAPS project.

O. I-40 Crosstown Corridor

The $100+ million reconstruction of I-40 will be an opportunity to strengthen connections between the Downtown and the river and enables a potential east-west

linkage to Downtown leading to the convention center and arena. Regardless of the eventual alignment of I-40, the plans should allow for ample north-south trail crossings and perhaps even the reuse of part of the existing east-west corridor if the new highway alignment differs from the existing route.

P(1) North Canadian West Greenway

The North Canadian River is one of Oklahoma City's most under utilized resources for recreation, transportation and tourism. However, its potential is now being realized, as evidenced by the proposed MAPS project targeted at the section of the river flowing through downtown. The banks of this river will provide an important corridor for trail development throughout the city. This corridor is ideal for both typical paved trails and "natural surface" trails due to the existing local natural environment.

The North Canadian West Greenway will provide a connection from Lake Overholser to the North Canadian Central Greenway, the Grand Boulevard Trail and the West I-44 Trail. The portion of this greenway from Meridian Ave. to I-44 is currently funded under the MAPS project. According to Riverfront Plans, it will include a trail on both sides of the North Canadian River with a trail bridge across the river between Meridian and Portland Avenue. The wide, grassy banks along the channelized river in this area represent an excellent opportunity for trail development. This corridor will extend through primarily rural areas and will connect with Sertoma Park and the I-40/Meridian lodging and restaurant district.

A natural section of the North Canadian River

P(2) North Canadian Central Greenway

The North Canadian Central Greenway would extend through downtown Oklahoma City from I-44 to Grand Boulevard. Part of this greenway segment, west of Eastern Avenue, is currently funded under the MAPS program. It will include trails on both sides of the North Canadian River with trail bridges at Robinson Avenue and Eastern Avenue. Demand for trails along the wide, grassy banks of the river can be evidenced by several "goat paths". Several parks can be accessed from this corridor, including River Park, Elm Grove Park, Tolan Park, Wheeler Park, Wiley Post Park and Rotary Playground. The Stockyards, a popular retail and dining locale, will also be accessible from the corridor, as well as area motels and the Downtown Air Park. The Downtown will be linked to this greenway by the Bricktown Canal. An extension from Eastern to I-40 will enable a linkage to the

Tinker/Draper Trail. This corridor is ideal for both typical paved trails and "natural surface" trails due to the existing local natural environment.

P(3) North Canadian East Greenway

The North Canadian East Greenway provides an opportunity to connect the eastern sections of Oklahoma City with the community-wide trail system. This scenic greenway along undeveloped sections of the North Canadian River will primarily serve recreational interests and will connect with the outskirts of Del City, Midwest City, Forest Park, and Spencer. The Chisholm Trail crosses the North Canadian River at some point along this corridor. The potential exists to provide an historical marker at this location. This corridor is ideal for both typical paved trails and "natural surface" trails due to the existing local natural environment.

Brock Park

Q. Meridian Avenue Link

Access to the Canadian River West Greenway Trail is the purpose of this trail. This linkage would include upgraded sidewalk linkages to the river and enable some bikeway connections in the area. Annually, tens of thousands of overnight visitors to Oklahoma City stay at this area's thirty plus hotels and motels and they eat at the dozens of area restaurants.

R. Brock Creek Trail

Brock Trail, as the name suggests, is a trail corridor recommended for development within Brock Park. This park is a linear park, complete with a small stream, which extends through residential areas and would provide ample space for trail development. This short trail would connect with the Grand Boulevard Trail, as well as Columbus School.

S. South Grand Boulevard Trail

This corridor will connect the banks of the North Canadian River with the southern sections of Oklahoma City, including the residential areas of Smith Village and Del City. Wide, vegetated rights-of-way and center medians along Grand Boulevard present excellent opportunities for off-road trail development. Many park facilities could be served by this corridor, including Trosper Park and Golf Course, Lorraine Thomas Park, Zurline Park, Woodson Park, May Park, Brock Park, Vinyard Park, Oliver Park, Hathaway Park, Rose Park, and Bob Akers Park. Other facilities and destinations include Rockwood School, Stand Watie Elemen-

tary, Rancho Village School, Southeast High School, Capitol Hill High School, St. Mary's High School, Airline Shopping Center, Reding Shopping Center and Southwest Medical Center.

T. Tinker/Draper Lake Trail

The Tinker/Draper Lake Trail extends from the North Canadian River to Lake Stanley Draper, thereby linking Oklahoma City's third lake, two suburbs, and the southeastern quadrant of the city into the overall trail system. This trail will be located along arterial roadways and will utilize adjacent right-of-way land. Several major facilities and destinations are located along this corridor, including Tinker Air Force Base, Rose State College, Air Force Hospital, General Motors and the VFW Sports Complex. The Del City library, Tinker Elementary, Ray Trent Park, Tinker Business Park, Del Crest Shopping Center and the Village Shopping Center would also be accessible from this trail. The trail has much potential as a link to employment centers.

U. Lightning Creek Trail

Lightning Creek is a stream corridor that winds through residential areas in southern Oklahoma City. This stream corridor flows through and connects Oliver Park and Draper Park. These linear parks, to the north and south of the Grand Boulevard Trail, provide open spaces along the creek which are ideal for trail development. This corridor can provide an important linkage to the Grand Boulevard Trail for residents of this area but can be extended south of the Wal-Mart/I-240 crossing to other neighborhoods further south. Some portions of this trail may need to be bike routes and sidewalks along area streets.

V. Airport Trail

The Airport Trail will extend through southwest Oklahoma City from the Grand Boulevard Trail and connect to the Earlywine Trail. Oklahoma City Community College and Will Rogers Airport are located along this corridor which will utilize wide rights-of-way adjacent to local roads with low traffic volume.

W(1) Earlywine Trail

The Earlywine Street Trail will utilize wide rights-of-way along 104th Street and other roadways. It will connect Lake Stanley Draper and residential areas in southern Oklahoma City with the overall trail system. Facilities and destinations along the corridor include Brink Middle School, Greenbriar Business Park, Regency Park Shopping Center, a YMCA and Earlywine Park and Golf Course. Earlywine Trail can link to the Lightning Creek Trail along existing local neighborhood streets.

W(2) 104th Street Trail

The 104th Street Trail will connect the Earlywine Trail with Lake Stanley Draper. This segment starts near Sante Fe and extends through the City of Moore and a rural area to the Lake. The street is called N. 27th Street in Moore.

X. Draper Lake Trail

Lake Stanley Draper serves as an active recreational destination for on-road cyclists, mountain bikers, equestrians, water sport enthusiasts, and others. A road around the lake's perimeter currently provides a popular route for bicyclists, and numerous mountain bike and equestrian trails exist in the wooded areas surrounding the lake. Draper Lake Trail would be a loop trail around Lake Stanley Draper, with the northwest side of the lake being of higher priority. This trail would connect with additional mountain bike trails that have been proposed for development.

Y. South Canadian Greenway

A trail developed within the South Canadian River corridor could eventually connect western areas with the overall trail system, completing a non-motorized linkage from Oklahoma City south to Norman and Newcastle. This corridor is ideal for both typical paved trails and "natural surface" trails due to the existing local natural environment.

Chapter Five
Funding Resources

5.0 Overview

This report is fifth in a series of technical memorandums that comprise the Oklahoma City Trails Master Plan. Previous reports have defined existing conditions, goals and objectives for the trail system, potential trail corridors and guidelines for the design of bicycle and pedestrian facilities. Specific sources of funding for the implementation of the Master Plan are provided in this report, as well as suggested strategies which have been used by other communities to "stretch" their trail development dollars.

Funding for the implementation of the Oklahoma City Trails Master Plan does not have to be entirely provided by the City. In fact, nearly all successful trail development efforts are the result of partnerships involving the public and private sectors. Downsized agencies and smaller budgets have forced governments to explore ways to fund public projects without levying unwanted tax increases. Many communities involved with trail implementation are choosing to leverage local government and private money as a match for outside federal, state and private funding sources, in essence multiplying their financial resources.

5.1 Supply and Demand Economics

Typically, trail development projects that are sponsored by public agencies only take into consideration what can be termed "supply-side" economics. That is, how much it will cost to build high quality trail facilities using outside contract labor and materials. The consultant team advocates that public agencies also consider and work to develop "demand-side" economics that will help to either reduce or offset the cost of trail facility development through the creation of partnerships between the public and private sectors.

Public-private partnerships have successfully put trails on the ground in cities and towns across the country, while reducing the costs of facility development. A good example is the Swift Creek Greenway in Cary, North Carolina. This greenway, built entirely out of recycled materials, was funded by an extensive array of both public and private partners. Forty percent of the construction cost for this project was provided by private sector partners while the remaining 60% of the cost was covered by the Town of Cary. Another example is the Hot Springs Creek Greenway in Arkansas where $120,000 in private donations has been raised through a Gifts Catalog, which is being leveraged against a $400,000 ISTEA grant (see

"Federal Funding Sources"). There are many examples such as this all over the country, and a strong potential for similar partnerships exists in Oklahoma City.

Some of the trails that will become a part of the Oklahoma City trails network are already funded. Additional trails surrounding Lake Hefner are scheduled to be built in 1997. Funding for these trails is being provided by an ISTEA grant and matching funds from the Oklahoma City Water Utilities Trust (OCWUT) and Oklahoma City Beautiful. Also, as part of the MAPS projects, trails are funded along the North Canadian River corridor where a master plan has already been completed.

During trail development in Oklahoma City, local advocates and government staff should pursue a variety of funding sources. For the Oklahoma City Trails Master Plan, funding for the design and construction of trails, and maintenance of these trails will be derived from three primary sources: local funds, state funds, and federal government programs. Within these three headings, funds are available from public or governmental organizations, not-for-profit organizations, and for-profit private sector organizations. The following text defines the sources of funding that are currently available within the three primary categories.

5.2 Local Funding Sources

The examples listed below are funding sources that have been pursued by other communities for trail development.

5.2.1 Local Transportation Improvement Programs

Funding for qualified segments of the Oklahoma City Trails System can be funded through the area-wide Transportation Improvement Program (TIP) prepared by the Association of Central Oklahoma Governments (ACOG) using federal Surface Transportation Program funds. Trail facility projects would need to be nominated and submitted, as with all other transportation improvement projects. Trail projects would also have to compete against roadway widening, bridge replacement, and resurfacing projects. ACOG's TIP could be utilized to identified rights-of-way adjacent to road improvement projects occurring along proposed trail routes. Identification of these projects early in the design development phase may allow bicycle facility provisions to be incorporated.

5.2.2 Bond Referendums

Communities across the nation have successfully placed propositions on local ballots to support trail development. The Charlotte-Mecklenburg County, NC, area passed four consecutive referendums that generated more than $3 million for greenways. Guilford County, NC also passed a referendum that appropriated $1.6 million for development of a specific greenway corridor.

Local bonds such as the General Obligations Bonds (G.O. Bonds), could also be a future source of funds. Additionally, school bonds could help develop trail facilities on or around school property.

5.2.3 Trail Funding Through Impact Fees

Impact fees are monetary one-time charges levied by a local government on new development. Unlike subdivision exactions, impact fees can be applied to finance trail facilities located beyond the boundary of development. The purpose of impact fees is not to raise general revenue, but to ensure that adequate capital facilities will be provided to serve and protect the public. They can be levied through the subdivision or building permit process.

5.2.4 Local Capital Improvements Program

Perhaps the true measure of local government commitment to greenways is a yearly appropriation for trail development in the Capital Improvements Program (CIP). In Raleigh, NC, greenways continue to be built and maintained, year after

year, due to a dedicated source of annual funding, administered through the Parks and Recreation Department.

5.2.5 Penny Sales Taxes

In the past, penny sales taxes have been a successful means of raising funds for a variety of projects in Oklahoma City. These taxes can be levied for varying amounts of time and have the potential of raising a significant amount of funds. A quarter of a penny tax, for example, would raise more than $10 million per year. The MAPS projects are currently being supported by a five year, one penny sales tax which will expire in December of 1998. In the past, area voters have supported other one year sales taxes for various special purposes.

5.2.6 Drainage Utility Fees

A potential source of future funding for off road trails in Oklahoma City may exist through Drainage Utility Fees. This is a fee that could be administered by the Water Utility Trust. This fee would be designed to fund development and maintenance of "access roads" along drainage channels and creeks throughout the City. These access roads could double as off road trails in certain situations depending on factors such as topography and land ownership. Similar programs are currently under way in Tulsa, OK.

5.2.7 Oil Royalties

The oil and gas resources beneath various municipal and trust lands could be a valuable source for funding the development of the Oklahoma City Trails System. In the past, these oil royalties have helped fund a variety of development projects including parks and riverfront activities.

5.2.8 Local Private-Sector Funding

Local industries and private businesses may agree to provide support for development of trails throughout Oklahoma City through:

- donations of cash to a specific trail segment;
- donations of services by corporations to reduce the cost of trail implementation, including equipment and labor to construct and install elements of the trail;
- reductions in the cost of materials purchased from local businesses which support trail implementation and can supply essential products for facility development.

Oklahoma City Beautiful, through the Lake Hefner Improvements Committee raised more than $75,000 in local funds to help build the Lake Hefner Trails. Another example of a successful endeavor of this type is the Swift Creek Recycled Greenway in Cary, NC. A total of $40,000 in donated construction materials and labor made this trail an award-winning demonstration project. This method of

raising funds requires a great deal of staff coordination. (Note: Some materials used in the "recycled trail" were considered waste materials by local industries!)

The following is a list of local corporations and businesses that are potential sources of donated money, resources and services for the greenway effort.

AT&T
Borden Inc.
Building Owners & Man. Assoc.
Conoco, Inc.
General Motors Corporation
Hardee's Food Systems, Inc.
Hitachi Computer Products
OG&E Electric Services
Remington Park
Wal-Mart Stores
and many others
Blue Cross & Blue Shield
Bridgestone/Firestone Corp.
CMI Corporation
Dolese Bros. Company
Great Plains Coca-Cola Bottling Co.
Hertz Corporation
Fred Jones Industries
Pepsi-Cola Co. of OKC
Target Stores
Xerox Corporation

5.2.9 Trail Sponsors

A sponsorship program for trail amenities allows for smaller donations to be received both from individuals and businesses. The program must be well planned and organized, with design standards and associated costs established for each amenity. Project elements which may be funded can include wayside exhibits, benches, trash receptacles, entry signage, and picnic areas. Usually, plaques recognizing the individual contributors are placed on the constructed amenities.

5.2.10 Volunteer Work

Community volunteers may help with trail construction, as well as fundraising. Potential sources of volunteer labor in Oklahoma City could include the Sierra Club, Earthbike Fellowship, the Oklahoma Bicycle Society, Boy Scouts, the VFW and local civic clubs such as the Kiwanis, Rotary and Lions Clubs.

A case in point is Cheyenne, Wyoming's volunteer greenway program. The Greater Cheyenne Greenway has motivated an impressive amount of community support and volunteer work. The program has the unusual problem of having to insist that volunteers wait to begin landscaping the trail until construction is completed. A manual for greenway volunteers was developed in 1994 to guide and regulate volunteer work. The manual includes a description of appropriate volunteer efforts, request forms, waiver and release forms, and a completion form (volunteers are asked to summarize their accomplishments). Written guidelines are also provided for volunteer work in 100-year floodplains.

To better organize volunteer activity, Cheyenne developed an "Adopt-a-Spot" program. Participants who adopt a segment of trail are responsible for periodic trash pick-up, but can also install landscaping, prune trail-side vegetation, develop wildlife enhancement projects, and install site amenities. All improvements must be consistent with the Greenway Development Plan and must be approved by the local Greenway Coordinator. Adopt-a-Spot volunteers are allowed to display their names on a small sign along the adopted section of greenway.

5.2.11 "Buy-a-Foot" Programs

"Buy-a-Foot" programs have been successful in raising funds and awareness for trail and greenway projects throughout the country. Under local initiatives, citizens are encouraged to purchase one linear foot of the greenway by donating the cost of construction. An excellent example is the High Point Greenway "Buy-a-Foot" campaign in North Carolina, where linear greenway "feet" were sold at a cost of $25/foot. Those who donated were given a greenway T-shirt and a certificate. This project provided over $5,000 in funds.

5.3 State Funding Sources

5.3.1 The Oklahoma Recreational Trails Fund Program

The Oklahoma Recreational Trails Fund Program (Trails Program) was created to expand monies funded by the National Recreational Trails Fund Act (NRTFA). This act was part of the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 (see Federal Funding Sources section). The National Highway System Designation Act of 1995 (NHS Act), which amended ISTEA, provides $15 million to states for fiscal years 1996 and 1997 for trails and trail related projects.

The NRTFA is a state administered federal aid program managed through the Federal Highway Administration in consultation with the Department of the Interior. Half of the funds available to states are allocated equally among eligible states. The other half of the funds are allocated in proportion to the amount of non-highway recreational fuel use in each eligible state. The Recreation Trails Fund Program for Oklahoma is administered by Susan Henry at the State Tourism and Recreation Department. The state can grant these funds to both private and public sector organizations. In Oklahoma, NRTFA projects are 50 percent federally funded, and grant recipients must provide a 50 percent match. Projects funded must be consistent with the Statewide Comprehensive Outdoor Recreation Plan (SCORP). Interested parties should contact Susan Henry with the Oklahoma State Tourism and Recreation Department at (405) 521-2904.

5.4 Federal Funding Sources

Some Federal programs offer financial aid for projects that aim to improve community infrastructure, transportation, housing and recreation programs. Some of the Federal programs that can be used to support the development of a trail include:

5.4.1 The Intermodal Surface Transportation Efficiency Act (ISTEA)

The primary source of federal funding for greenways is through the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), which is authorized through fiscal year 1997. There are many sections of the Act that support the development of bicycle and pedestrian transportation corridors. Those sections that apply to the creation of trail systems include:

- Symms National Recreational Trails Fund Act (NRTFA)
  A component of ISTEA, the NRTFA is a funding source to assist with the development of non-motorized and motorized trails. The Act uses funds paid into the Highway Trust Fund from fees on non-highway recreation fuel used by off-road vehicles and camping equipment.

- Congestion Mitigation and Air Quality Improvement (CMAQ) Program
  The CMAQ program was created to reduce congestion on local streets and improve air quality. Funds are available to urban communities designated as “non-attainment” areas for air quality, meaning the air is more polluted than federal standards allow. Since Oklahoma City is not currently classified as a non-attainment area for air quality, it is not eligible for this funding. However, this funding source should be considered in the event that the air quality deteriorates.

- National Highway System (NHS)
  A state may spend NHS funds on "construction of bicycle transportation facilities on land adjacent to any highway on the National Highway System (other than the Interstate System)." Two types of projects are covered by this source. First, trail facilities can be constructed as an incidental part of a larger NHS project, such as the trail facilities built along I-70 in Colorado. These facilities are constructed at the same time as the larger project. Second, facilities that are constructed adjacent to an NHS route, but are built as an independent project, are also eligible.

  In addition, NHS funds can be transferred to the Surface Transportation Program by the state. The city of Seattle, for example, transferred $2 million of NHS funds to their STP to construct a 50 foot median along a five mile stretch of roadway, including walkways, crosswalks, and other pedestrian amenities.

- Surface Transportation Program (STP) Funds

These funds can be used for bicycle and pedestrian facility construction or non-construction projects such as brochures, public service announcements, and route maps related to bicycle safety. The projects must be related to bicycle and pedestrian transportation and must be part of the Long Range Transportation Plan. See the Local Funding Sources Section for more details.

- STP Transportation Enhancements Program

Ten percent of Oklahoma's annual STP funds are available for transportation "enhancements", which include projects such as scenic byways, historic transportation preservation, landscaping and the development of bicycle and pedestrian facilities. These funds are available to all cities and counties in the State of Oklahoma. Funded projects in Oklahoma City include Lake Hefner Trails and the I-240 corridor beautification project. There are several key requirements listed below that projects must meet in order to receive these funds.

- Approval of ACOG is required for projects located within Oklahoma City.
- Funds require a 20% match of local funds. Federal funds cannot be used for the match. In-kind services and donated properties are not eligible as matches.
- Professional consulting fees are eligible for Enhancements funding, but cannot be used as a match.
- The sponsor is responsible for preparing design development drawings and specifications.
- Land acquisition must be in accordance with federal requirements (sponsoring agencies are required to follow certain procedures in acquiring lands, and must follow these procedures if they intend to apply for Enhancement funds).
- Maximum funding amount per project is $250,000 for rural areas and $500,000 for urban areas.
- Application deadlines usually occur in October of each year.

The above requirements are subject to change based on the proposed reauthorization of ISTEA in October 1997. Contact the Oklahoma State Enhancement Funds Coordinator, Tim Gatz, at 405-521-2454 for more information.

5.4.2 National Scenic Byways Program

This component of ISTEA is designed to protect and enhance America's designated scenic roads. Money is available for planning, safety and facility improvements, cultural and historic resource protection, and tourism information signage. Some states with Scenic Byways Programs have developed trail facilities in conjunction with this initiative.

5.4.3 Community Development Block Grant Program

The U.S. Department of Housing and Urban Development (HUD) offers financial grants to communities for neighborhood revitalization, economic development, and improvements to community facilities and services, especially in low and moderate-income areas. Several communities have used HUD funds to develop greenways, including the Boscobel Heights' "Safe Walk" Greenway in Nashville, TN.

5.4.4 Land and Water Conservation Fund (LWCF) Grants

This Federal funding source was established in 1965 to provide "close-to-home" park and recreation opportunities to residents throughout the United States. Money for the fund comes from the sale or lease of nonrenewable resources, primarily federal offshore oil and gas leases and surplus federal land sales. LWCF grants can be used by communities to build a variety of park and recreation facilities, including trails and greenways.

LWCF funds are distributed by the National Park Service to the states annually. Communities must match LWCF grants with 50 percent of the local project costs through in-kind services or cash. All projects funded by LWCF grants must be used exclusively for recreation purposes, in perpetuity.

5.4.5 Watershed Protection and Flood Prevention (Small Watersheds) Grants

The USDA Natural Resource Conservation Service (NRCS) provides funding to state and local agencies or nonprofit organizations authorized to carry out, maintain and operate watershed improvements involving less than 250,000 acres. The NRCS provides financial and technical assistance to eligible projects to improve watershed protection, flood prevention, sedimentation control, public water-based fish and wildlife enhancements, and recreation planning. The NRCS requires a 50 percent local match for public recreation, and fish and wildlife projects.

5.4.6 Urban and Community Forestry Assistance Program

The USDA provides small grants of up to $10,000 to communities for the purchase of trees to plant along city streets and for greenways and parks. To qualify for this program, a community must pledge to develop a street-tree inventory; a municipal tree ordinance; a tree commission, committee or department; and an urban forestry-management plan.

5.4.7 Small Business Tree Planting Program

The Small Business Administration provides small grants of up to $10,000 to purchase trees for planting along streets and within parks or greenways. Grants are used to develop contracts with local businesses for the plantings.

5.4.8 Design Arts Program

The National Endowment for the Arts provides grants to states and local agencies, individuals and nonprofit organizations for projects that incorporate urban design, historic preservation, planning, architecture, landscape architecture and other community improvement activities, including greenway development. Grants to organizations and agencies must be matched by a 50 percent local contribution. Agencies can receive up to $50,000.

5.4.9 Conservation Reserve Program

The U.S. Department of Agriculture (USDA), through its Agricultural Stabilization and Conservation Service, provides payments to farm owners and operators to place highly erodible or environmentally sensitive landscapes into a 10-15 year conservation contract. The participant, in return for annual payments during this period, agrees to implement a conservation plan approved by the local conservation district for converting sensitive lands to less intensive uses. Individuals, associations, corporations, estates, trusts, cities, counties and other entities are eligible for this program. Funds from this program can be used to fund the maintenance of open space and non-public-use greenways, along bodies of water and ridge lines.

5.4.10 Economic Development Grants for Public Works and Development of Facilities

The U.S. Department of Commerce, Economic Development Administration (EDA), provides grants to states, counties and cities designated as redevelopment areas by EDA for public works projects that can include developing trails and greenway facilities. There is a 30 percent local match required, except in severely distressed areas where federal contribution can reach 80 percent.

5.5 Private Foundations and Corporations

Many communities have solicited greenway funding from a variety of private foundations, corporations, and other conservation-minded benefactors. The following is a list of organizations, local and nation wide, that are possible sources for future trail development funds.

5.5.1 Kerr Foundation

The Kerr Foundation is a private foundation that funds programs, organizations and institutions which provide new or enhanced opportunity to all state residents, particularly the young, in the areas of education, health, cultural development and community service. Preference is given to organizations and institutions that have a beneficial impact on the economic, social and cultural growth and development of Oklahoma. Normally, the organization or institution approved for a grant must raise or secure 100% matching funds within one year of the approval date. Applications are accepted year-round. For more information, contact the Kerr Foundation at (405) 842-1631.

5.5.2 Kirkpatrick Foundation

The Kirkpatrick Foundation in Oklahoma City offers grants for the betterment of the arts, education, and the environment. Tax exempt non-profit organizations can apply for the grants which are given on a quarterly basis. The amounts of these grants vary from project to project. Susan McCalmont can be contacted at the Foundation (840-2882) for more information.

5.5.3 Sarkeys Foundation

The Sarkeys Foundation is a private, charitable foundation that provides support to non-profit organizations and institutions in the State of Oklahoma. During 1995, the foundation awarded $500,000 to projects and programs related to conservation and the environment. Grant proposals are considered at the April and October meetings of the Board of Trustees. For more information, contact the Sarkeys Foundation at (405) 364-3703.

5.5.4 Samuel Roberts Noble Foundation, Inc.

This foundation is based in Ardmore, Oklahoma, and is rated as one of the largest private, charitable foundations in the country. Although the foundation's main focus is on research, grants are made when additional funds are available. Grant proposals from tax-exempt organizations in the state of Oklahoma are accepted. In the past, funds have been awarded in the areas of quality of life, community affairs and public affairs. For more information, contact Donna Windel, Grants Manager, at (405) 223-5810.

5.5.5 The Margaret Annis Boys Trust Fund

This fund was established in order to help beautify and care for parks, medians, open spaces, rights-of-ways, public lands and non-profit lands in Oklahoma City. This Trust Fund, which is administered by the Oklahoma City Community Foundation, is geared towards helping projects that are highly visible to the public, group initiatives, and designed to be long term improvements to the landscape. Grant applications are received on a quarterly basis. For more information, contact the Oklahoma City Community Foundation at 1300 N. Broadway, PO Box 1146, Oklahoma City, OK, 73101, or call (405) 235-5603.

5.5.6 The Tree Bank Foundation of Oklahoma

This local foundation is dedicated to improving the quality of life in the state through tree planting and proper maintenance. The foundation facilitates the planting of trees on the grounds of nonprofit groups and on public land by providing large trees (five to ten feet tall) at low cost. To date, more than 40,000 trees have been distributed to cities and towns across Oklahoma through the foundation. For more information, contact the Tree Bank Foundation at 5005 N. Penn, Suite 301, Oklahoma City, OK, 73112, or call (405) 842-3320.

5.5.7 American Greenways DuPont Awards

The Conservation Fund's American Greenways Program has teamed with the DuPont Corporation and the National Geographic Society to award small grants ($250 to $2000) to stimulate the planning, design and development of greenways. The awards are intended to:

1. Develop action-oriented greenway projects;
2. Assist grassroots greenway organizations;
3. Leverage other money for greenway development; and
4. Recognize and encourage greenway organizations.

Grant recipients are selected according to the following criteria:

1. The importance of the project to local greenway development efforts;
2. The extent to which the grant will result in matching funds or other support from public or private sources;
3. Demonstrated community support for the project;
4 Likelihood of tangible results;
5. Capacity of the organization to complete the project; and
6. The degree to which the project serves as a model for planning and developing greenways.

These grants can be used for activities such as mapping, conducting ecological assessments, surveying land, holding conferences, developing brochures, producing interpretive displays and audiovisual materials, incorporating land trusts, building trails and greenway facilities, and other creative projects. Grants cannot be used for academic research, institutional support, lobbying or political activities. Interested parties should contact the American Greenways Program of the Conservation Fund at (703) 525-6300.

5.5.8 Walking Magazine Trail Restoration Fund

Walking Magazine, hoping to encourage more volunteer efforts among trail users, established this fund for the restoration of urban, suburban or rural walking trails. The magazine provides small grants, generally from $200 to $500, to help walking clubs and other groups purchase trail maintenance equipment or supplies.

5.5.9 Coors Pure Water 2000 Grants

Coors Brewing Company and its affiliated distributors provide funding and in-kind services to grassroots organizations that are working to solve local, regional and national water-related problems. Coors provides grants, ranging from a few hundred dollars to $50,000, for projects such as river cleanups, aquatic habitat improvements, water quality monitoring, wetlands protection, pollution prevention, water education efforts, groundwater protection, water conservation and fisheries.

5.5.10 World Wildlife Fund Innovative Grants Program

This organization awards small grants to local, regional and statewide non-profit organizations to help implement innovative strategies for the conservation of natural resources. Grants are offered to support projects which:

1. Conserve wetlands;
2. Protect endangered species;
3. Preserve migratory birds;
4. Conserve coastal resources; and
5. Establish and sustain protected natural areas, such as greenways.

Innovation grants can help pay for the administrative costs of projects including planning, technical assistance, legal and other costs to facilitate the acquisition of critical lands; retaining consultants and other experts; and preparing visual presentations and brochures or other conservation activities. The maximum award for a single grant is $10,000.

5.5.11 REI Environmental Grants

REI (Recreational Equipment Incorporated) awards grants to organizations in protecting and enhancing natural resources for outdoor recreation. Grants of up to $500 are available through this program and can be used for:

1. Preservation of wildlands and open space;
2. Advocacy-oriented education for the general public on conservation issues;
3. Building the membership base of a conservation organization;
4; Direct citizen action (lobbying) campaigns for public land and water recreation issues; and
5. Projects that serve to organize a trails constituency or enhance the effectiveness of a trail organization's work as an advocate.

Chapter Six
Implementation Plan

6.0 Overview

The Oklahoma City Metro Trails System offers tremendous potential to improve the quality of life for community residents. The Trails System will improve access to outdoor resources, link people to their favorite destinations, stimulate economic growth, expand opportunities for education and shape community growth into the 21st Century. All of this is possible as the trail system is successfully developed during the coming years. The key to this success is implementation. This chapter describes an innovative and strategic plan for building, managing and operating the Metro Trails System.

The hallmark of implementing this community-wide trails system will be the formation of a public-private partnership that can serve as promoter, developer and manager of the 28 corridors that constitute the Metro Trails System. This chapter defines how this partnership should be established and operated. Cooperation and coordination among several agencies, private sector businesses and individuals will be essential to the development of the Trails System. This chapter will provide guidelines for such coordination to ensure the timely development of the community-wide network of trails. Additionally, a phasing strategy for implementing the Oklahoma City Metropolitan Trails System is defined, as are facility development costs, policies, programs and costs for operating, managing and maintaining the system.

6.1 The Public-Private Partnership

Nationally, successful greenway and trails systems have emerged through public-private partnerships that are developed to take advantage of the full complement of resources that are available within every community. Public-private partnerships enable trail systems to be developed and managed in a cost-effective manner, creating ownership and investment throughout the community. Community resources that are typically tapped to support trail development broadly include financial, materials for construction and labor or person-power that is available throughout the community. Successfully combining all of these community resources within Oklahoma City in support of the development of the Metro Trails System is the goal of this Plan.

This Plan recommends the creation of a public-private partnership, **The Oklahoma City Metropolitan Trails Council**. The Council will be comprised of public agencies, private organizations and individuals who will work together to pool talent, resources, goals and implementation strategies to create the community-wide trails system. It will take a number of years for the entire system to be developed. Therefore, it is imperative that the Trails Council be established formally so that it is capable of executing the recommendations described within this Plan.

Additionally, local government has a very important role to play in the development, operation and management of the Oklahoma City Metro Trails System. This role, and that of the private sector are more thoroughly described in the following text.

6.1.1 Local Government's Role

The community-wide trail system will need the services of a caretaker and steward. The most reliable source of these services will come from the City of Oklahoma City. However, in order to successfully keep pace with the multitude of development, operation and management requirements of this trail system, the private sector will be called upon to share the burden and participate in stewardship of the trails system where appropriate. The following divisions of local government will play key roles in the implementation of the Oklahoma City Metro Trails System.

Role of the City Manager

The City Manager for Oklahoma City is vested with management responsibilities for the communities public resources. As such, the City Manager shall have a role in land acquisition, planning, design, development and management requirements and responsibilities with respect to the Oklahoma City Metro Trails System. The City Manager may choose to delegate any or all of these responsibilities to departments and divisions of the City.

Role of the Planning Department

The Oklahoma City Planning Department shall primarily be responsible for the master planning and design of the Oklahoma City Metro Trails System. The Planning Department shall be charged with providing staff support to the Oklahoma City Metropolitan Trails Council, and shall assist the members of this Council in the execution of their duties. Designation of a bicycle and pedestrian coordinator is suggested. The Planning Department shall be caretaker of the official Trails System Map, and shall periodically be charged with updating this map so that it provides current information on the status of the community-wide trail system. The Planning Department shall coordinate its work with neighborhood associations and the local business community, as well as with other departments, boards and authorities within the city to ensure that project corridor development proceeds in an efficient, cost effective and manageable fashion.

The Planning Department staff should consult the existing and planned regional bicycle route facilities identified from the Association of Central Oklahoma Governments inventory, and make efforts to link them when possible. Coordination with adjacent municipalities who have existing or planned trails is vital and the Department should continue to inform them of the Metro Trails System Plans.

Role of the Parks and Recreation Department

The Oklahoma City Parks and Recreation Department shall work with the Planning Department to facilitate the preparation of necessary planning and design docu-

ments for the Oklahoma City Metro Trails Plan, including master plans, site development documents and management plans. The Parks and Recreation Department shall coordinate with the Adopt-a-Trail Program sponsored by the Metropolitan Trails Council to ensure that affected segments of existing and newly developed trail are cared for by citizen groups and civic organizations. The Parks and Recreation Department shall work with the Water and Wastewater Trust to coordinate routine and remedial maintenance and management activities. The Board of Park Commissioners has responsibilities for public parks and park grounds used for park purposes, and will help the Parks Department determine whether or not specific trail plans or development will conflict with the Department's operations.

Role of the OKC Water Utility Trust

The Water Utility Trust owns a significant amount of land throughout the community, some of which is included within proposed trail corridors that have been defined by this Plan. The staff of the Trust should work with the Planning and Parks and Recreation Department to coordinate the development of the community-wide trails system. Prior to the development of any trail segment or facility, the Planning and Parks and Recreation Departments will need to work with Trust staff to ensure that trail facility development that occurs on property owned by the Trust is not in conflict with the operational aspects of the Trusts' water and wastewater operations. The Trusts should also coordinate management and maintenance activities of its land holdings with the Parks and Recreation Department and Adopt-a-Trail organizations to ensure that joint-use trail lands are maintained in an appropriate manner.

Role of the Public Works Department

The Oklahoma City Public Works Department shall work with the Planning and Parks and Recreation Departments in the development of trail corridor segments that intersect with lands and public improvements that are the responsibility of the department. Public Works should also coordinate management and maintenance responsibilities with the Parks and Recreation Department and Water Utility Trust to ensure that trail lands and facilities can be operated in a safe and effective manner. The Public Works Department will be responsible for consultant selection, design contracts, bidding and construction administration on all Oklahoma City projects related to the trails system.

Role of the MAPS Project Office

The MAPS Project Office shall work with the Planning Department to coordinate the development of MAPS projects with the implementation of the Oklahoma City Metro Trails System. MAPS staff shall share resource information, development schedules and specific design development plans for MAPS projects, and examine potential coordination of funding resources, design development, architectural and engineering services, and construction contractors where possible and practical.

Role of Transit Services Department

The Transit Services Department shall work with the Planning Department to coordinate route system, schedules and facility development, so as to maximize ridership in areas that can be served by the Metro Trails System. Transit Services should review design development plans for new trail heads and neighborhood connections to determine if current ridership can access future trail facilities to improve the efficiency of the transportation system, and encourage the development of pedestrian studies along transit routes. Efforts should be made to encourage installation of bike racks on buses along certain bus routes which connect to the Metro Trails System.

Role of the Police Department

The Oklahoma City Police Department should work with the Parks and Recreation Department to coordinate patrol, safety education, and design development for the Metro Trails System. The Police Department should work with the Planning and Parks and Recreation Department to develop safety and security plans, policies and procedures outlined later in this chapter. It is recommended that the Police Department assign one new staff person to the bicycle patrol unit to assist with management of the Metro Trails System.

Role of the Fire Department

The Oklahoma City Fire Department should work with the Police and Parks and Recreation Departments to develop an emergency response plan for the Oklahoma City Metro Trails System, as defined later in this chapter.

6.1.2 Private Sector Role

The Oklahoma City private sector has a vital role to play in the design, development, management, operations and maintenance of the Metro Trails System. The private sector includes businesses, merchants, corporations, civic organizations and individuals. The private sector has a wealth of resources to offer toward the implementation of the Metropolitan Trails System, and will be the primary beneficiaries of a successfully developed and managed system. The following text defines one specific private sector role, and then suggests generic roles that other organizations and groups might have in the development of the Metro Trails System.

Role of OKC Metropolitan Trails Council

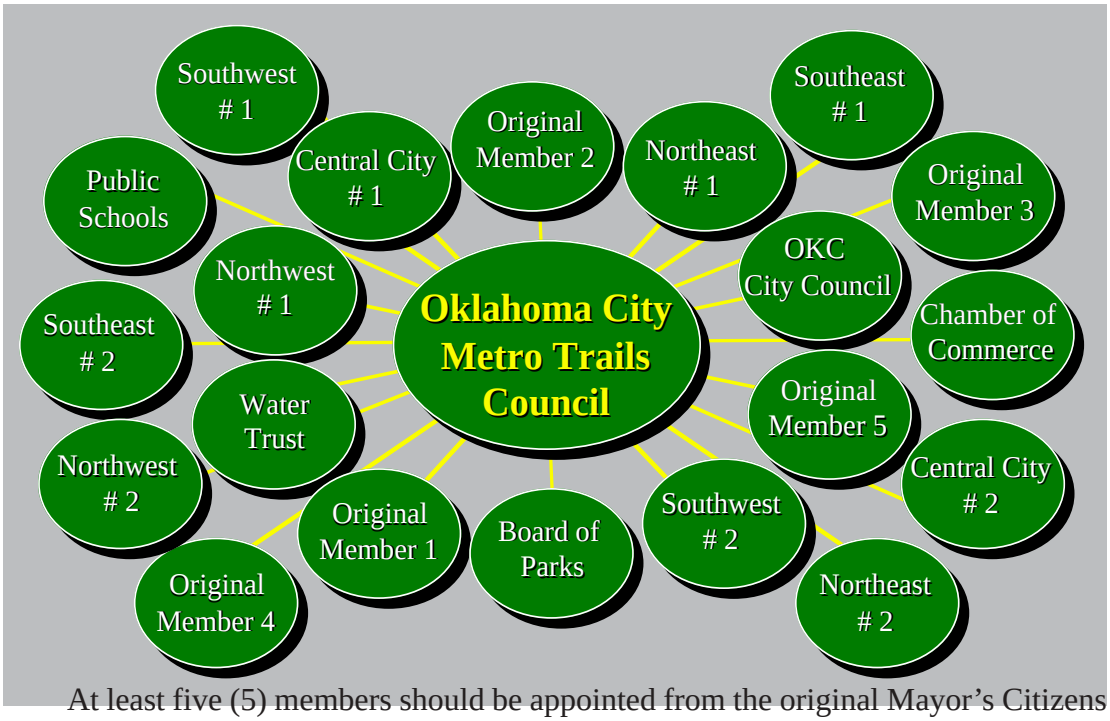
The Oklahoma City Council should establish the Oklahoma City Metropolitan Trails Council to advise and assist the City with the design, development, management and operation of the Oklahoma City Metro Trails System. Under one alternative, the Trails Council could be composed of up to twenty (20) member, appointed from groups such as the following:

Ten (10) members appointed by the City Council from geographic regions of the

city: two each from the northwest, southwest, central city, northeast and southeast. Members should have an interest in trails, outdoor activities and the cultural or natural heritage of the community.

Seven (7) members appointed from the following organizations:

- the Board of Park Commissioners
- the Oklahoma City Chamber of Commerce
- the South Oklahoma City Chamber of Commerce
- the Oklahoma City Council
- the Water and Wastewater Trust
- a coalition of public schools
- The Association of Central Oklahoma Governments (ACOG)



At least five (5) members should be appointed from the original Mayor's Citizens Advisory Committee that worked to develop this Master Plan.

The purpose of the Metropolitan Trails Council shall be to execute the vision, goals and objectives that are defined within this Master Plan. The Trails Council should work to establish its organization under United States Internal Revenue Service Tax Code 501C3 as a tax exempt, non profit corporation so that it is capable of receiving charitable contributions. The Council's initial activities shall include:

1) Coordination with the Planning Department and other city departments to develop Phase I projects of the Metro Trails System;
2) Assist the city in raising development and management funds for the Metro Trails System;
3) Develop a marketing program for the Metro Trails System that will serve

to inform local residents of the benefits and pursuits of the trails program;

4) Advise the City Council on development activities and trail programming by producing an Annual Report for public review and comment;
5) Work with the Parks and Recreation Department to sponsor programs on the trails system that will serve to promote education, health, fitness and other activities;
6) Review requests from the community for trail development, and consider all invitations for the donation of land, material and labor for the development of the trails system;
7) Develop a format for recognizing persons and organizations that assist in the development, operation and management of the Metro Trails System;
8) Establishing a web site for Metro Trails on the Internet in order to make information about the Trail System readily available to residents and visitors;
9) Sponsor an Adopt-a-Trail Program to provide assistance with management, maintenance and operations of trails within the Metro Trails System.
10) Provide on-going evaluation of trail program objectives and safety issues.

The Metropolitan Trails Council shall receive initial staff support from the Oklahoma City Planning Department. The Trails Council should receive its initial operating funds from the Oklahoma City General Fund. If appropriate and agreed upon by the City Council, the Trails Council may pursue financial grants and other sources of revenue to support staffing and operational requirements. The Trails Council may be able to generate funding from trail programming activities, such as races, an Annual Trails Day, and other activities throughout the year.

Local Businesses and Corporations

Local businesses and corporations might consider sponsoring a segment of trail for development. Under the trail naming guidelines defined later in this chapter, a 50% or greater contribution of the total value of trail segment construction would enable the sponsored trail to be named after the business or an individual. Businesses and corporations might also consider a gift or donation of construction material, finished products that could be used on the trail, or labor to help build the trail. Additionally, businesses and corporations could provide reduced cost materials, finished products, machinery and/or labor to assist in trail project development. Employers can provide incentives for employees who commute using the trails system. Among the incentives are bike racks, showers and lockers

Civic Organizations

Local civic groups and organizations, including the Junior League, Boy Scouts, Girl Scouts, Garden Clubs, YMCA's, YWCA's, Citizens League of Central Oklahoma, Neighborhood Alliance, Oklahoma City Beautiful and Kiwanis Club, to name a few, can play a vital role in the development and management of the Metro Trails System. Civic organizations and trail user groups can contribute the time and labor of their mem-

bers to assisting the Trails Council and local government with staffing trails events, adopting segments of the trail for maintenance and management, sponsorship of trail segments for construction of trail tread, boardwalks, education exhibits and rest areas. Some of these user groups include the Earthbike Fellowship, Oklahoma City Bicycle Society, Oklahoma Wheelchair Athletic Association, Runners' Club, Sierra Club and Volkssport. There are endless ways in which local civic groups can become involved with the Metro Trails System, and the best way is to match the goals and objectives of the organization to the needs of the trails system.

Individuals

Local residents interested in the development and management of the Metro Trails System can offer their time, labor and expertise to the Trails Council and local government. Individuals might partner with a friend or neighbor to volunteer their services as Deputy Trail Rangers, to help patrol trails during the daytime. Individuals could volunteer to plant native trees, shrubs and groundcovers along the trail to improve the appearance of a newly developed trail segment. Individuals could volunteer to keep a particular stretch of trail segment clean of debris, litter and trash. All volunteer efforts will be recognized by the Trails Council through an appropriate community-wide program.

6.2 Building the Metro Trail System

Preparation of this Master Plan is only the initial step in the future development of a Metropolitan Trail System for Oklahoma City. More detailed design development work is required before actual trail tread is constructed and residents are able to use the trail corridors. Therefore, involvement of citizens, businesses, and neighborhoods is vital to a successful design. This section of the Chapter, along with Chapter Three, Design Guidelines are intended to provide a step-by-step process for building segments of the Metro Trails System.

6.2.1 Trail Design Development Documents

Each trail corridor and/or segments of each corridor will require a more detailed site design process to determine the appropriate routing and alignment of the actual trail tread. Additionally, the location of trail amenities, such as trail furniture, landscaping, restrooms (if applicable), parking (if applicable), lighting (if applicable) need to be defined and located throughout the corridor.

This Master Plan proposes the development of an interconnected system of 12-foot wide minimum asphalt or concrete paved trails within each of the 28 corridors defined in Chapter Four, Description of Trail System. Natural surface trails are a viable option and potentially an additional consideration in ten of the trail corridors defined in Chapter Four, as "corridors ideal for natural surface trails." Including "natural surface" trails as a portion of this Master Plan is an effort to recognize and consider scouts, hikers, cross country joggers, mountain bicyclists, and other naturalists as viable trail users represented by this Master Plan. In some instances a natural surface trail could be constructed before a paved trail. In these cases the route of the natural surface trail

should not conflict with the location of the proposed paved trail.

The City of Oklahoma City will need to produce detailed site plans and design development documents for all trail segments, regardless if the trail is to be paved or remain a natural surface. The City will need to utilize staff resources with skills in landscape architecture, civil engineering, structural engineering and architecture to prepare the necessary site plans and design development documents for each of the trail corridors and trail segments. The City may choose to employ consultants to perform these duties.

6.2.2 Phasing Strategy for Development

The Master Plan Consultant Team examined each of the corridors profiled in this plan and developed a phasing strategy for building trail facilities within each of the corridors during the next twenty-five years. It is important to note that this phasing strategy involves the construction of paved trails throughout the community. It is very possible, and may in fact be more desirable to open for public use "natural surface" trails. These trails would be limited to certain types of public access and use as determined on a case-by-case basis by the Metro Trails Council and the City of Oklahoma City. In this manner, some trails in mid-term and long-term phases of development might come "on-line" in earlier phases as limited access/use natural surface trails. The Oklahoma Earthbike Fellowship has determined trails within the entire system that are suitable for use as natural surface trails and this is denoted in the following text.

The consultants used the following criteria to determine corridors that would most likely be developed in the early stages of the twenty-five year period.

Need: a determination of the desirability for developing the corridor based on information obtained during public workshops that were held during the planning process. Also, a determination by the consultant regarding the potential number of residents that would be served through the development of the corridor.

Population Density: the ability of the Metro Trails System to serve all urbanized subareas of the City.

Linkage: the ability of the corridor to connect points of origin to destinations. Origins should be somewhat densely populated areas of the City such as residential neighborhoods. Destinations should be highly visited places including the City's lakes, parks, schools, shopping centers, public buildings, etc.

Vulnerability: an assessment by the consultant team as to the possibility that the corridor might be lost due to activities on surrounding land uses.
Opportunity: an evaluation of the potential for development based on cur-

rent land use conditions observed by the consultant during the planning process.

Resources: a determination by the consultant that sufficient financial and other resources exist to develop the corridor.

A more thorough examination of each corridor will be required in order to better determine the suitability and practicality of development. This phasing strategy is meant to serve as a guide for short term implementation of certain corridors. Full implementation of the entire Oklahoma City Trails Master Plan is projected to take place over the next twenty-five years.

Projects Warranting Further Study for Early Implementation

Using the criteria defined above, the consultant selected the following corridors as candidate projects that warrant further study for immediate implementation. These corridors best satisfied the criteria and would serve the greatest number of residents throughout the City. It is anticipated that these corridors could be developed within the next three to five years.

Hefner/Overholser Trail Link
Lake Hefner Trail (funded)

The Lake Hefner Trail is currently under construction. The Lake Hefner to Lake Overholser Trail Link was chosen as the most likely prospect for early development by citizens who attended public meetings during the master planning process. The trails that already exist around Lake Hefner are very popular. Other trails intended for early action include:

Lake Overholser Trail
Grand Boulevard Trail Southern Segment (funded from Woodson Park to Santa Fe Avenue)Lincoln/Robinson Link
Tinker/Draper Lake Trail
Lightning Creek Trail
Earlywine Trail
Draper Lake Trail
Bricktown Canal Trail (funded)
Nichols Hills Trail
Deep Fork Greenway*
West I-44 Trail
Katy Trail*
North Canadian Central Greenway* (funded)
*(potential natural surface trail)
The corridors listed above comprise the inner loop trails to be developed through-

out the City. This will be considered the backbone of the overall Metro Trails System, and should therefore be made a development priority. This inner loop of trails offers a geographically balanced approach to construction of trail development. It also offers residents in all major geographic regions of the community with access to the Metro Trails System.

Corridor Concepts for the Longer Term

Corridors for the longer term include the remainder of those identified in Chapter Four. Some of these corridors may be developed earlier in conjunction with road improvement projects, drainage improvements, lake improvements, local area initiatives or other programs. For the purpose of this Master Plan, it is anticipated that without other influence, these corridors would be developed during the next five to twenty five years.

19th Street Link
Meridian Avenue Link
North Canadian West Greenway *
Brock Creek Trail
104th Street Trail
Airport Trail
Portland Avenue Trail
Turnpike Trail*
Deep Fork/Lake Arcadia Greenway*
Broadway Extension Trail*
North Canadian East Greenway*
South Canadian Greenway*
I-40 Corridor
* (potential for natural surface trail)

6.2.3 Trail and Facility Construction

After each trail has been design, and has met other development requirements, the City and/or the Metro Trails Council will need to construct the trail facility. The City may elect to use local government staff, materials, equipment and machinery to build trail segments. The City may also elect to employ the services of construction contractors to build certain segments of the trail system. Volunteer labor may also be used to construct segments of the system, in particular, natural surface trails. All construction should adhere to the guidelines that have been specified in Chapter Three of this Plan, and the Operations, Management and Maintenance policies, procedures and requirements that are defined later in this chapter. This and proper supervision of volunteers will ensure that trails remain a quality oriented public facility. In all cases, volunteer labor should be governed by agreements with an appropriate City agency that includes a waiver of liability for work performed on the trails system.

6.3 Facility Development Cost Estimates

The consultant team has prepared cost estimates for all of the corridors defined within this Master Plan. The cost estimates are general in nature and are based on national industry or State of Oklahoma averages. A listing of the industry averages that were used to determine "low" or "high" estimates are provided below and on the following pages. The purpose of these cost estimates is to provide guidance for the purpose of budgeting and developing trail segments. The estimates are reliable to the extent that a general expectation can be derived from their use. Specific site development factors unique to each corridor will influence final design development costs.

A preliminary construction cost estimate is provided in tabular form following page153 of this Chapter. Cost estimates for trails are based on the development of a 12-foot wide asphalt trail tread, with minimal allowance for trail furniture and minor drainage structures. This estimate is provided for the purpose of budgeting, planning and phasing only. The cost estimate does not account for detailed design development requirements for each corridor. Additionally, the costs provided below illustrate estimates for other trail tread types.

Category/Description of Facility	**Unit**	**Unit Costs**
Trail Treads		
6-foot Bare Earth Hiking/Mtn. Bike Trail	linear feet	$5.00
8-foot Bare Earth Equestrian Trail	linear feet	$7.50
8-foot Woodchip Pedestrian Trail	linear feet	$10.00
12-foot Soil-Cement Multi-Purpose Trail	linear feet	$12.00
12-foot Aggregate/Stone Trail	linear feet	$15.00
12-foot Asphalt Multi-Purpose Trail	linear feet	$25.00
12-foot Concrete Multi-Purpose Trail	linear feet	$50.00
12-foot Wood Deck/Boardwalk Trail	linear feet	$250.00
Signage		
Information Signs	each	$1,000.00
Direction Signs	each	$200.00
Warning Signs	each	$200.00
Mile Markers	each	$250.00
Furniture/Furnishings		
Benches	each	$600.00
Trash Receptacles	each	$400.00
Security Bollards	each	$250.00
Bicycle Racks	each	$500.00
Fencing (Board-on-Board)	linear feet	$20.00
Gates	each	$750.00
AT&T 911 Phones	each	$1,000.00

Restrooms		each	$40,000.00
Landscaping		allowance	$25,000.00/mile

Parking Lots	**Unit**	**Gravel Lot**	**Asphalt Lot**
10 cars	each	$7,500.00	$14,000.00
20 cars	each	$15,0000.00	$28,000.00
40 cars	each	$30,000.00	$56,000.00

Typical Costs for On-Road Bicycle Facilities

In limited circumstances, it may be necessary to install on-road bicycle facilities in order to connect the off-road trail system defined by this Plan. Itemized below are costs for facilities that would most likely be needed to provide linkage.

Restriping

Conducted as part of a regularly scheduled roadway resurfacing project and does not include right-of-way acquisition and changes to signal actuation.

Bicycle Lanes	$7,200/mi	(Greenways Incorporated)
Wide Outside Lanes	$6,450/mi	(Greenways Incorporated)

Independent Projects

Listing is for development of facility type. Right-of-way cost estimates are provided as a general guide. Not all projects will require the acquisition of right-of-way. Real estate values fluctuate dramatically and will need to be adjusted on a parcel-by-parcel basis.

Urban Bike Lanes (4' wide, both sides)	$200,000/mi	(Florida DOT)
Rural Bike Lanes (4' wide, both sides)	$110,000/mi	(Florida DOT)
Paved Shoulders (4' wide, both sides)	$110,000/mi	(Florida DOT)
Wide Curb Lane (14' wide, both sides)	$130,000/mi	(Florida DOT)

Other Bicycle Facilities

Class I Bicycle Parking (Bicycle Lockers - per 2 bicycles)	$500-$1500	(Bicycle Federation of America)
Class II Bicycle Parking (Secure wheels and frame)	$65-$150/bike	(Bicycle Federation of America)
Class III Bicycle Parking (Inverted U's or rail racks)	$65-$80/bike	(Bicycle Federation of America)
Bike Route/ "Share the Road" sign	$250/sign	(Greenways Incorporated)

Typical Costs for Pedestrian Facilities

Sidewalks

6' wide, 2 sides	$54,000/mi	(Florida DOT)

Pedestrian Signal Heads

For 2 corners	$1,800	(Florida DOT)
For 4 corners	$3,700	(Florida DOT)

Other Pedestrian Facilities

Pedestrian Overpass	$300/sq ft	(Greenways Incorporated)
Crosswalk Striping	$250 each	(Greenways Incorporated)
Curb Extensions	$4,500 each	(Greenways Incorporated)

6.4 Operations, Maintenance and Management

Operating, maintaining and managing the Oklahoma City Metropolitan Trails System will require a coordinated effort among local government agencies, the Metro Trails Council and private sector organizations and individuals. The following text defines the key aspects of trail system management, beginning with operational policies, followed by trail facility management, land management, safety and security, trail rules and regulations, an emergency response plan, and a risk management plan. The last subject in this section of the chapter provides typical costs and a funding source for maintaining trails.

6.4.1 Operations Policies

Over the course of time, the City of Oklahoma City and the Metro Trails Council will encounter a variety of issues that are important to the successful management and operation of the Metro Trails System. The following operational policies are defined to assist the City and Trails Council in responding to typical trail implementation issues. More specific problems and issues may arise during the long-term development of the trail system that result in additional policies being considered and adopted.

Oklahoma City Metropolitan Trails System Map Policy

The official Oklahoma City Metropolitan Trails System Map is illustrated on a 1-inch to 1-mile scale drawing, as prepared by LandPlan Consultants, Inc. of Tulsa, OK. The plan was approved by the Oklahoma City Planning Commission on the 27th of March, 1997, and by the Oklahoma City Council on the 6th of May,1997 and is on display in the Planning Department. The Planning Department is vested with the responsibility of keeping the map current with respect to completed trail segments, and additions or deletions to the overall system.

The official map illustrates three important aspects of the Metro Trails System; one, trails that are currently developed and open for public access and use; two, trail corridors that warrant further study for early implementation; and three, trail corridors that are part of the longer term phased development strategy.

Land Acquisition Policy

The majority of land that is included within the Oklahoma City Metro Trails System corridors is currently publicly owned or under some public control. For those lands that are in private ownership, the City of Oklahoma City will negotiate with individual property owners for the use of their land for trail purposes. Oklahoma City will accept donation of property or easements for the Metro Trails System that is contained within the corridors defined on the official Trails System Map in accordance with existing policies and codes pertaining to the acquisition of parkland, transportation corridors and land for water and wastewater facilities.

Right of Public Access and Use of Trail Lands Policy

The general public shall have free access to and use of all trail lands that are owned by the City of Oklahoma City, or on land that the City has secured the right of public access and use. All access and use is governed by existing City policies and shall also be governed by the City's Trail Ordinance. The use of all trails is limited to non-motorized uses, including hiking, bicycling, running, jogging, wheelchair use, skateboarding, rollerblading, equestrian use, mountain biking, and other uses that are determined to be compatible with the City's trails by the Oklahoma City Metropolitan Trails Council. For trails that are built within land owned by the Oklahoma City Water Utilities Trust, trail use will be restricted to activities that are determined to be consistent with the protection of water quality and other local, state and federal regulations.

Naming of Trails Policy

The majority of trails within the Metro Trails System shall be named for the significant natural features that are found within the trail corridor. For example the Lake Hefner Trails are so named because they encircle Lake Hefner. Some trails are named for historic routes of travel throughout the city, for example Grand Boulevard. Trails can be named after an individual or individuals if these persons are truly distinguished within the community, or if these persons have contributed a gift equal to more than 50% of the value of trail development within that corridor segment.

Fencing and Vegetative Screening Policy

Oklahoma City will work with each landowner on an individual basis to determine if fencing and screening is required and appropriate. Oklahoma City may agree to fund the installation of a fence or vegetative screen, however, it shall be the responsibility of the adjacent property owner to maintain the fence or vegetative screen in perpetuity, including the full replacement of such fence or screen in the event of failure or deterioration due to any circumstances.

Adopt-a-Trail Program Policy

An Adopt-a-Trail Program should be established by the Oklahoma City Metro Trails Council to encourage community groups, families, businesses, school groups, civic clubs and other organizations to join in managing the Metro Trails System. The Trails Council will need to work closely with the Parks and Recreation Department and the Oklahoma City Water Utilities Trust to ensure that all Adopt-a-Trail Program groups manage and maintain trails in a manner that is consistent with other land use objectives. The Trails Council shall develop written agreements for each Adopt-a-Trail entity and keep a current record of this agreement on file at the Oklahoma City Parks and Recreation Department (see example provided Attachment A). Adopt-a-Trail entities will be assigned a specific section of the Metro Trails System, defined by location or milepost. The activities of each organization shall be monitored by the Trails Council or its designee. Agreements for management can be amended or terminated at any time by either party, giving 30 days written notice.

Management Agreements Policy

Management Agreements will be established between the City of Oklahoma City and specific public or private organizations wishing to assist with the management of designated segments of the OKC Metropolitan Trails System. The objective of these agreements is to define areas of management that are compatible with existing land management activities, especially where the Metro Trails System intersects with public or private properties and/or rights-of-way. Management agreements spell out specific duties, responsibilities and activities of the City and public or private organization that wishes to assist the City with management activities. They can be amended or terminated at any time by either party, giving 30 days written notice (See example provided Attachment B).

Cross Access Agreements Policy

Oklahoma City will use cross access agreements to permit private landowners that have property on both sides of a trail corridor access to and use of a trail corridor to facilitate operation and land use activities. An example cross access agreement is provided within this Plan (See Attachment C) which can serve as a model for how cross access can be obtained and maintained by Oklahoma City and adjacent property owners.

This cross access agreement is based on case law of the United States and specific experiences from other trail systems throughout the United States. Adjacent landowners generally have the right to use the access at any time. However, access can not block the right-of-way for trail users, other than for temporary measures such as permitting livestock to cross, or transporting equipment. Adjacent landowners are responsible for acts or omissions which would cause injury to a third party using the trail. If a landowner must move products, materials, livestock or equipment across the trail on a regular basis, appropriate signage will be installed to warn users of the trail to yield for such activities.

Crossing of abandoned or active rail lines, utility corridors and/or roads and highways will require the execution of agreements with companies, local, state or federal agencies and organizations that own the rights-of-way. These crossings must provide clearly controlled, recognized, and defined intersections in which the user will be warned of the location. In accordance with the American Association of State Highway Transportation Officials (AASHTO) and the Manual on Uniform Traffic Control Devices (MUTCD), the crossing will be signed with appropriate regulatory, warning and information signs.

6.4.2 Trail Facility Management

Trail facilities should be maintained in a manner that promotes safe use. All trail facilities shall be managed by Oklahoma City, the Metro Trails Council or their designee. Trail heads, points of public access, rest areas and other activity areas should be maintained in a clean and usable condition at all times. The primary concern regarding

maintenance should always be public safety. For lands owned by the Oklahoma City Water Utilities Trust, the primary concern shall be the protection of water quality and public health.

Trail Maintenance should include the removal of debris, trash, litter, obnoxious and unsafe man-made structures, and other foreign matter so as to be safe for public use. Removal of native vegetation should be done with discretion, removal of exotic species should be accomplished in a systematic and thorough manner. The objective in controlling the growth of vegetation should be to maintain clear and open lines of sight along the edge of the trail, and eliminate potential hazards that could occur due to natural growth, severe weather or other unacceptable conditions.

All trail surfaces should be maintained in a safe and usable manner at all times. Rough edges, severe bumps or depression, cracked or uneven pavement, gullies, rills and washed out treads shall be repaired immediately. Volunteer vegetation occurring in the tread of the trail should be removed in such a manner so that the trail surface is maintained as a continuous, even and clean surface. Oklahoma City shall strive to minimize the number of areas where ponding water occurs, however they cannot be held liable for public use through areas of casual or ponded water.

6.4.3 Land Management

Property owned or used by the City of Oklahoma City for the Metro Trails System should be maintained in a condition that promotes safety and security for trail users and adjacent property owners. To the extent possible, the property should also be maintained in a manner that enables the trail corridor to fulfill multiple functions (i.e. passive recreation, alternative transportation, stormwater management and habitat for wildlife). Property that is owned or managed by the Oklahoma City Water Utilities Trust, Board of Park Commissioners, Riverfront Trust, or other boards, shall be managed and maintained in accordance with the policies of that trust, or public body responsible for the affected parcel.

Vegetation within each trail corridor should be managed to promote safety, serve as wildlife habitat, buffer public trail use from adjacent private property (where applicable), protect water quality, and preserve the unique aesthetic values of the natural landscape. To promote safe use of the trail system, all vegetation should be clear cut to a minimum distance of three (3) feet from each edge of a trail. Selective clearing of vegetation should be conducted within a zone that is defined as being between three (3) to ten (10) feet from each edge of a trail. At any point along a trail, a user should have a clear, unobstructed view, along the centerline of a trail, 300 feet ahead and behind his/her position. The only exception to this policy should be where terrain or curves in a trail serve as the limiting factor. Oklahoma City or its designated agent shall be responsible for the cutting and removal of vegetation. Removal of vegetation by an individual or entity other than Oklahoma City or a City designee should be deemed unlawful and

subject to fines and/or prosecution

6.4.4 Safety and Security

Safety is a duty and obligation of all public facilities. In order to provide a standard of care that offers reasonable and ordinary safety measure, Oklahoma City should develop and implement a Safety and Security Program for the trail. This program should consist of well defined safety and security policies; the identification of trail management, law enforcement, emergency and fire protection agencies; the proper posting, notification and education of the trail user policies; and a system that offers timely response to the public for issue or problems that are related to safety and security. Oklahoma City will need to coordinate the safety and security of the Metro Trail System with local law enforcement officials, local neighborhood watch associations, and Adopt-a-Trail organizations.

Important components of the safety and security program should include:

1) Oklahoma City should work with the Metro Trails Council, City Police and Park Rangers to establish a Metro Trails Safety and Security Committee that can meet monthly to discuss management of the trail system.
2) Oklahoma City should prepare a Trail Safety Manual and distribute this to management agencies and post it at all major trail heads.
3) Oklahoma City should post User Rules and Regulations at all public access points to the trail.
4) Oklahoma City should work with the management agencies to develop Greenway and Trail Emergency Procedures.
5) Oklahoma City should prepare a Safety Checklist for the trail system, and utilize it monthly during field inspection of trail facilities.
6) Oklahoma City should prepare a Trail User Response Form for complaints and complements and provide copies at all trail heads.
7) Oklahoma City should work with management agencies to develop a system for accident reporting analysis.
8) Oklahoma City should conduct a regular Maintenance and Inspection Program, and share the results of these investigations with all management agencies.
9) Oklahoma City should institute a Site Design and Facility Development Review Panel, made up of city departments so that all design development recommendations can be reviewed prior to installation.
10) Oklahoma City should coordinate other Public Information Programs that provide information about trail events and activities that city residents can participate in.
11) Oklahoma City should have an ongoing evaluation of trail program objectives. It would be best to have this evaluation conducted by OKC Metro Trails Council and local trail user groups.

6.4.5 Trail Rules and Operation Regulations

The Oklahoma City Metropolitan Trails System shall be open 365 days a year to any person wishing to use the facility for transportation or recreation purposes — subject to the terms of the Oklahoma City Metro Trails Ordinance that governs all use. No organization shall be permitted to use any portion of the Metro Trails System for a commercial purpose unless written permission has been obtained from the City of Oklahoma City.

Oklahoma City shall always discourage the general public from using any segment of a trail that is under construction Trail segments shall not be considered officially opened for public use until such time as a formal dedication ceremony and official opening has been completed. Individuals who use trail segments that are under construction, without written permission from Oklahoma City shall be deemed in violation of this access and use policy and treated as a trespasser. Oklahoma City should also discourage trail users from interacting in an unsafe manner with any portion of the water transmission system that is owned and operated by the Oklahoma City Water Utilities Trust.

Trail User Rules and Regulations

The Oklahoma City Metro Trail System shall be operated like all other parks within the City, open for public use from sunrise to sunset, as posted by the Parks and Recreation Department, 365 days a year, except as specifically designated. Individuals who are found to be using unlighted facilities after dusk and before dawn should be deemed in violation of these hours of operation and treated as trespassers. Where trails are lighted for nighttime use, the rules established within the Trail Ordinance shall govern permitted uses and activities.

Oklahoma City shall enforce three types of trespass violations. A Level One violation, is a first occurrence in which the violator is provided a written warning. Level Two violation is a second occurrence in which the violator is suspended for 30 days from using the trails system. Level Three violation is a multiple occurrence in which the violator is suspended for life from using the trails system.

Trail Ordinance

Multiuse conflict is a national problem for community and regional trail systems. Typically, conflicts are caused by overuse of a trail, however, other factors may be problematic including poorly designed and engineered trail alignments, inappropriate user behavior, or inadequate facility capacity. The most effective conflict resolution plan is a well conceived safety program that provides the individual user with a Code of Conduct for the Trail, sometimes called a Trail Ordinance. Several communities across the United States have adopted progressive trail ordinances to govern public use and keep trails safe for all users. The following Rules and Regulations shall be implemented for the Oklahoma City Metropolitan Trails System . These rules should be

displayed both on brochures and information signs throughout the trails system.

1) Be Courteous: All Trail users, including bicyclist, joggers, walkers, wheelchairs, skateboarders and skaters, should be respectful of other users regardless of their mode of travel, speed, or level of skill. Never spook animals; this can be dangerous for you and other users. Respect the privacy of adjacent landowners!
2) Keep Right: Always stay to the right as you use the Trail, or stay in the lane that has been designated for your user group. The exception to this rule occurs when you need to pass another user.
3) Pass on the Left: Pass others going in your direction on their left. Look ahead and behind to make sure that your lane is clear before you pull out an around the other user. Pass with ample separation. Do not move back to the right until you have safely gained distance and speed on the other user. Faster traffic should always yield to slower on-coming traffic.
4) Give Audible Signal When Passing: All users should give a clear warning signal before passing. This signal may be produced by voice, bell or soft horn. Voice signals might include “Passing on your left!” or “Cyclist on your left!” Always be courteous when providing the audible signal - profanity is unwarranted and unappreciated.
5) Be Predictable: Travel in a consistent and predictable manner. Always look behind before changing position on the Trail, regardless of your mode of travel.
6) Control Your Bicycle: Lack of attention, even for a second, can cause disaster - always stay alert! Maintain a safe and legal speed at all times.
7) Do not Block the Trail: When in a group, including your pets, use no more than half the trail, so as not to block the flow of other users. If your group is approached by users from both directions, form a single line or stop and move to the far right edge of the Trail to allow safe passage by these users.
8) Yield when Entering or Crossing Trails: When entering or crossing the Trail at uncontrolled intersection, yield to traffic already using the other trail.
9) The Use of Lights: (where permitted) When using the Trail after dawn or before dusk be equipped with proper light. Cyclists should have a white light that is visible from five hundred feet to the front, and a red or amber light that is visible from five hundred feet to the rear. Other Trail users should use white lights (bright flashlights) visible two hundred fifty feet to the front, and wear light or reflective clothing.
10) Do not Use this Trail Under the Influence of Alcohol or Drugs: It is illegal to use this Trail if you have consumed alcohol in excess of the statutory limits, or if you have consumed illegal drugs. Persons who use a prescribed medication should check with their doctor or pharmacist to ensure

that it will not impair their ability to safely operate a bicycle or other wheeled vehicle.

11) Clean-up Your Litter: Please keep this Trail clean and neat for other users to enjoy. Do not leave glass, paper, cans or any other debris on or near the Trail. Please clean up after your pets. Pack out what you bring in - and remember to always recycle your trash.
12) Keep Pets on Leashes: All pets must be kept on secure and tethered leashes. Keep pets off of adjacent private property. Failure to do so will result in a fine.
13) Prohibition on Camp Fires: Fires, for any purpose, are prohibited within the Trails System. Any person caught lighting a fire for any purpose will be prosecuted to the fullest extent of the law.

6.4.6 Emergency Response Plan

In order to effectively patrol the Metro Trails System and respond to the potential for fire, floods and other natural or human-caused disasters, Oklahoma City shall adopt a trails emergency response plan. This plan defines a cooperative law enforcement strategy for the Trail based on services required and those that are typically provided by police, sheriff, fire and EMS agencies. Specifically, all trails shall be provided with an address system that denotes specific locations along the length of a trail corridor. A site plan that illustrates points of access to each trail corridor shall be produced and kept on file at the City Planning Department. Each trail shall be designed to permit access for law enforcement, fire and EMS agencies and vehicles that are not in excess of 6.5 tons gross vehicle weight. A system of cellular-type emergency phone shall be located in remote sections of the system, providing users with access to the area 911 Emergency System.

The emergency response plan shall also define the agencies that should respond to 911 calls, and provide easy to understand routing plans and access points for emergency vehicles. Local hospitals should be notified of these routes so that they may also be familiar with the size and scope of the project. The entire Trail system shall be designed and develop to support a minimum gross vehicle weight of 6.5 tons.

6.4.7 Risk Management Plan

The purpose of a Risk Management Plan is to increase safety for the users of the Oklahoma City Metro Trails System and reduce the potential for accidents to occur within the system or on lands adjacent to the system. While it is impossible to guarantee that all risk will be eliminated by the completion of a Risk Management Plan, implementation of a plan is in fact a critical step that is necessary to reduce liability and improve safety. A Risk Management Plan establishes a methodology for trail management that is based on current tort liability and case law in the United States related to the development, operation and management of public use trail lands and facilities.

The ultimate responsibility for managing the Metro Trails System, as defined within this Plan, rests with Oklahoma City. The City is considered the Risk Management Coordinator. The Risk Management Plan has as its major goals:

1) Risk Identification: determining where risk (threat to safety or potential loss) exists within the corridor.
2) Risk Evaluation: conducting appropriate examination of areas defined as a risk and determining the factors that contribute to risk.
3) Risk Treatment: defining and implementing an appropriate solution to the area of risk in accordance with one of the four options:
a) risk avoidance: prohibiting use of a risk area.
b) risk reduction: limit use of area and repair risk area immediately.
c) risk retention: obtain waivers from all potential users of the risk area.
d) risk transfer: transfer risk area (property) to an agency better suited to manage the area.

The following sixteen step plan should be implemented by Oklahoma City to establish a Risk Management Plan for the Oklahoma City Metro Trails System.

1) Develop a policy statement about risk management
2) Conduct a needs assessment of Oklahoma City , Inc. as an organization.
3) Determine goals and objectives for risk management - what is acceptable and not acceptable management levels.
4) Develop specifications for site and facility development.
5) Establish a clear and concise program for risk management.
6) Define supervision and responsibility for risk management.
7) Define appropriate rules and regulations that govern the use of the trail system.
8) Conduct routine/systematic inspections and investigations of the trail system.
9) Develop an accident reporting and analysis system.
10) Establish procedures for handling emergencies.
11) Develop appropriate releases, waivers and agreements for use and management.
12) Identify best methods for insuring against risk.
13) Develop a comprehensive in-service training program for employees of Oklahoma City.
14) Implement a public relations program that can effectively describe the risk management program and activities.
15) Conduct periodic reviews of the Risk Management Plan by outside agents to ensure that the Plan is up to date.
16) Maintain good legal and insurance representation.

Liability

The design, development, management, and operation of the Oklahoma City Metro Trails System must be carefully and accurately executed in order to provide a resource that protects the health and welfare of the public. Liability may occur when a facility has been under designed to handle its intended volume of use; when management of the facility is poor; or when unexpected accidents occur because the trail manager failed to recognize the possibilities of a potentially hazardous situation. To reduce the possibility and exposure to liability, Oklahoma City should have in operation the following measures prior to opening the first segment of the trail:

1) a thorough Maintenance Program that provides the appropriate duty or level of care to greenway users;
2) a Risk Management Plan that appropriately covers all aspects of the trail system, and as necessary adjacent landowners;
3) a comprehensive working knowledge of public use laws and recent case history applicable in Oklahoma.

Oklahoma City's existing municipal insurance program should be adequate to protect the community from financial loss that might occur through the development and operation of a public use trail system. Trails are no greater liability to the community than park and recreation resources. The City should review its current policy and check coverages to be certain that all aspects of its policies are up to date.

Oklahoma City should exercise reasonable care in the design and construction of all trail facilities to reduce hazardous, public nuisance and life threatening situation. Recreational Use Statutes in Oklahoma serve to reduce the exposure that adjacent landowners might expect to realize from the proximity of the trail to private property. In fact, it is very difficult to find any case law in the United States where an adjacent property owner has been sued because a trail user strayed onto the adjacent private property and fell victim to an accident that was caused by the adjacent landowner. Some landowners have claimed that their insurance rates would go up because of the presence of a trail abutting their property. Once again, there is no case history among insurance companies to support this claim — provided the landowner has not gone out of their way to create an attractive nuisance and lure trail users onto their property.

It is also important that Oklahoma City not charge a fee to use any portion of the Metro Trails System facility, because typically this may impact the way in which the recreational use statutes in Oklahoma apply to the use of the system. A voluntary donation applied to the trail system, will generally not affect the recreational use statute.

6.4.8 Maintenance Costs

The following maintenance costs are provided as a guide to establishing a budget for the operation, maintenance and management of each trail segment within the Metro Trails System. These costs are derived from national industry averages and have not been adjusted to reflect unique labor, material and cost issues within Oklahoma City.

It will be possible to substantially lower the cost of maintaining one mile of paved trail through the development of an Adopt-a-Trail Program. Volunteers have been proven effective in performing some of the routine maintenance activities that are listed below. Savings of 50% of the estimated cost per mile defined below are possible through a coordinated and well run Adopt-a-Trail Program, and some of these costs are already being covered along highways, roads and parks and other areas.

Typical Maintenance Costs (For a 1-Mile Paved Trail)

Drainage and storm channel maintenance (4 x/year)	$700.00
Sweeping/blowing debris off trail tread (24 x/year)	$1,600.00
Pick-up and removal of trash (24 x/year)	$1,600.00
Weed control and vegetation management (10 x/year)	$1,350.00
Mowing of 3-ft grass safe zone along trail (24 x/year)	$1,750.00
Minor repairs to trail furniture/safety features	$500.00
Maintenance supplies for work crews	$300.00
Equipment fuel and repairs	$800.00
Total Maintenance Costs Per Mile of Paved Trail	$8,600.00
Re-Surfacing of Paved Trail Tread (10 year cycle)	$50,000/mile

Maintenance Trust Fund

The Metropolitan Trails Council should work to establish a Trust Fund to aid in paying some of the costs for maintenance and management of trail segments. The Fund would be established by soliciting funds from both public and private sector sources. The principal balance of the fund would provide two benefits: 1) the interest generated from the fund would be used to aid in the funding of annual maintenance activities; 2) in the event of expensive short term maintenance needs, the principal balance could be tapped to support these activities. The Trust Fund should be established by the Trails Council, in association with a local financial management organization.

6.50 Further Evaluation Needed

The Metro Trails Plan is a key component of an overall strategy to encourage the use of alternative modes of transportation. The City of Oklahoma City will also need to supplement the work that has been completed in this Plan with further studies and evaluations of bicycling and walking. It is recommended that the City complete the following activities.

1) Formulate an annual action plan for trail system development and complete trail designs for the specific corridors that are defined within this Plan.

2) Evaluate the existing sidewalk and pedestrian system throughout the City, especially near schools and transit routes, and develop an overall plan of action for completing segments of sidewalks that are currently missing or in a state of disrepair.

3) Prepare an on-road bicycle facility study of the Metro area, using the ACOG inventory as a starting point for this study.

Attachments

Action by Public Boards
Contract Examples
Agreement Examples

Oklahoma City Trails Master Plan
Listing of Trails Corridors
Projected Development Costs

Trail	Name	Length (mi)	Low Cost	High Cost	Phase
D	Lake Hefner Trail	9.23	$1,615	$2,077	F
N	Bricktown Canal Trail	1.10	$193	$248	F
P2	North Canadian Central Greenway	12.24	$2,142	$2,754	F
S	South Grand Boulevard Trail (3 miles)	3.00	$525	$675	F
	TOTAL FUNDED CORRIDORS	25.57	$4,475	$5,753	
E	Hefner/Overholser Trail	4.84	$847	$1,089	E
F	Nichols Hills Trail	3.79	$663	$853	E
H	Deep Fork Greenway	4.06	$711	$914	E
I	Lake Overholser Trail	7.13	$1,248	$1,604	E
J	West I-44 Trail	6.85	$1,199	$1,541	E
L	Lincoln Robinson Link	7.34	$1,285	$1,652	E
M	Katy Trail	5.71	$999	$1,285	E
S	South Grand Boulevard Trail (7 miles)	7.02	$1,229	$1,580	E
T	Tinker/Draper Lake Trail	9.15	$1,601	$2,059	E
U	Lightning Creek Trail	4.85	$849	$1,091	E
W1	Earlywine Trail	4.66	$816	$1,049	E
X	Draper Lake Trail	12.66	$2,216	$2,849	E
	TOTAL EARLY IMP. CORRIDORS	78.06	$13,661	$17,564	
A	Portland Avenue Trail	4.08	$714	$918	L
B	Turnpike Trail	12.96	$2,268	$2,916	L
C	Deep Fork/Lake Arcadia Greenway	7.14	$1,250	$1,607	L
G	Broadway Extension Trail	9.38	$1,642	$2,111	L
K	19th Street Link	2.84	$497	$639	L
O	I-40 Crosstown Corridor	3.41	$597	$767	L
P1	North Canadian West Greenway	19.54	$3,420	$4,397	L
P3	North Canadian East Greenway	7.97	$1,395	$1,793	L
Q	Meridian Avenue Link	2.01	$352	$452	L
R	Brock Creek Trail	1.92	$336	$432	L
V	Airport Trail	11.87	$2,077	$2,671	L
W2	104th Street Trail	6.75	$1,181	$1,519	L
Y	South Canadian Greenway	13.86	$2,426	$3,119	L
	TOTAL LONG TERM CORRIDORS	103.73	$18,153	$23,339	
	TOTALS ALL CATEGORIES	207.36	$36,288	$46,656	

(All Costs are in Thousands of Dollars)