December 1999

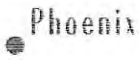
Town of Oro Valley Pedestrian & Bicycle Plan

ORO VALLEY, ARIZONA · FOUNDED 1974

CLA
Curtis Lueck & Associates

December 1999

Town of Oro Valley Pedestrian & Bicycle Plan



Prepared for

Prepared by

Curtis Lueck & Associates

ACKNOWLEDGEMENTS

The Town of Oro Valley would like to express its appreciation to the dedicated individuals who provided invaluable input in the development of the first-ever ***Town of Oro Valley Pedestrian and Bicycle Plan***. In addition to the many residents who attended the public open houses and provided important recommendations, the following individuals were instrumental in the preparation of the plan:

Oro Valley Town Council
Paul H. Loomis, Mayor
Richard M. Johnson, Vice-Mayor
Wayne Bryant, Council Member
Francis LaSala, Council Member
Paul Parisi, Council Member

Pedestrian and Bicycle Plan Steering Committee
Arnold "Balt" Balthazar, Citizen
Raymond Caryl, Citizen
Mike Jones, Citizen
Karen Redig, Citizen
William Schreiber, Citizen
Richard M. Johnson, Oro Valley Councilmember
John Russel, Parks Advisory Board
Richard Underwood, Development Review Board
Ainsley Reeder, Parks and Recreation Administrator
David Marsh, Planning Department
Melissa Shaw, Planning Department
Bayer Vella, Planning Department
Don Manspeaker, Public Works
Mike Stevenson, Oro Valley Police Department
Dick Schaffer, Pima Association of Governments

Department Heads
Chuck Sweet, Town Manager
Bill Jansen, Town Engineer

Division Heads
Bryant Nodine, Planning & Zoning Administrator
Ainsley Reeder, Parks and Recreation Administrator
John Zukas, Transit Services Administrator

Planning & Zoning Commission
Dennis Douglas, Chair
Wayne Wiant, Vice-Chair
Steve Ruble, Commissioner

Planning & Zoning Commission (cont.)
Dean McCook, Commissioner
Bill Moody, Commissioner
Martha Briggs, Commissioner
William Partridge, Commissioner

Parks Advisory Board
Karen Baker, Chair
Gary Chandler, Vice-Chair
Doug White, Board Member
Diane Milton, Board Member
Becky Blankenship, Board Member
Mark Brosseau, Board Member
Jo Grant, Board Member

Consultant
Curtis Lueck & Associates
Curtis Lueck, PhD., P.E., Principal
Matthew Zoll, Principal Planner

Abbreviated Definitions

Based upon Oro Valley Subdivision Street Standards, American Association of State Transportation Officials (AASHTO) and Arizona Revised Statutes (A.R.S.), where applicable.

Arterial or Major Street – These streets are generally found on section lines or State Routes, and are of regional significance. These streets are typically planned to be multi-lane facilities. (Oro Valley Subdivision Street Standards)

Bicycle – A device, including a racing wheelchair, that is propelled by human power and on which a person may ride and that has either: (a) two tandem wheels, either of which is more than sixteen inches in diameter, or (b) three wheels in contact with the ground, any of which is more than sixteen inches in diameter. (A.R.S. 28-101.6)

Bicycle Facilities – A general term denoting improvements and provisions made by public agencies to accommodate or encourage bicycling, including parking and storage facilities, and shared roadways not specifically designated for bicycle use. (AASHTO)

Bicycle Route System – A system of bikeways designated by the jurisdiction having authority with appropriate directional and informational route markers, with or without specific bicycle route numbers. Bike routes should establish a continuous routing, but may be a combination of any and all types of bikeways. (AASHTO)

Bikeway – A generic term for any road, street, path, or way which in some manner is specifically designated for bicycle travel, regardless of whether such facilities are designated for the exclusive use of bicycles or are to be shared with other transportation modes. (AASHTO)

Collector Street – Streets designed to facilitate the movement of traffic between local streets and major streets so that the frequency of intersections found on major streets is minimized. (Oro Valley Subdivision Street Standards)

Highway or Street – A general term denoting a public way for purposes of vehicular travel, including the entire area within the right-of-way. (AASHTO and A.R.S. 28-101.48)

Local Street – Streets that serve as access to residences, businesses or other abutting properties. Local streets are generally two-lane undivided roads with at-grade intersections and may have frequent driveway access. Local streets are intended and designed to provide access to abutting residential areas and supply this traffic to collector road systems. (Oro Valley Subdivision Street Standards)

Multiuse Lane – A portion of the roadway to the right or outside edge of travel lanes which is typically paved with asphaltic concrete, and which may be designated by striping, signing, and pavement markings for preferential or exclusive use of bicyclists. Multiuse lanes typically have curb and gutter. (General definition, not covered under AASHTO or A.R.S.)

Paved Shoulder – A portion of the roadway located to the right or outside edge of travel lanes which is typically paved with asphaltic concrete, and which may be designated by striping, signing, and pavement markings for preferential or exclusive use of bicyclists. Paved shoulders typically do not have curb and gutter. (General definition, not covered under AASHTO or A.R.S.)

Roadway – The portion of the highway, including shoulders, intended for vehicular use. (AASHTO)

Shared Roadway – Any roadway upon which a bicycle lane is not designated and which may be legally used by bicycles regardless of whether such facility is specifically designated as a bikeway. (AASHTO)

Shared-use Path – A bikeway physically separated from motorized vehicular traffic by an open space or barrier and either within the highway right-of-way or within an independent right-of-way. Shared-use paths may also be used by pedestrians, skaters, wheelchair users, joggers, and other non-motorized users. (AASHTO)

Sidewalk – The portion of a highway designed for preferential or exclusive use by pedestrians. (AASHTO)

Vehicle – A device, on or by which a person or property is or may be transported or drawn on a public highway, excluding devices moved by human power or used exclusively on stationary rails or tracks. (A.R.S. 28-101.52)

Table of Contents

1. INTRODUCTION **1**

OVERVIEW 1
BACKGROUND AND PURPOSE 1
ORGANIZATION OF THE PEDESTRIAN AND BICYCLE PLAN 3

2. GOALS AND OBJECTIVES **5**

PLAN VISION 5
Goal 1: Establish policies which promote walking and bicycling as healthy forms of transportation and recreation. *6*
Goal 2: Develop and maintain continuous and interconnected pedestrian and bikeway systems. *6*
Goal 3: Use pedestrian and bicycle-friendly standards, procedures and ordinances for pedestrian/bicycle facilities and roadways, including Crime Prevention Through Environmental Design principles to improve security. *7*
Goal 4: Develop and implement Town-supported programs to encourage pedestrian and bicycle usage and safety. *7*
Goal 5: Develop and maintain databases useful for pedestrian and bicycle planning, prioritization of improvements, and accident prevention. *7*
Goal 6: Encourage land uses which foster pedestrian and bicycle travel. *8*

3. PEDESTRIAN AND BICYCLE PLAN **9**

INTRODUCTION 9
EXISTING CONDITIONS 9
SUMMARY REVIEW OF RELATED PLANS AND PROGRAMS 10
PUBLIC INPUT 11
PEDESTRIAN FACILITY PLAN 12
BICYCLE FACILITY PLAN 14

4. SUPPORT FACILITIES AND PROGRAMS **17**

INTRODUCTION 17
PEDESTRIAN AND BICYCLE SUPPORT FACILITIES 17
PEDESTRIAN AND BICYCLE SUPPORT PROGRAMS 18

5. DESIGN GUIDELINES **21**

REFERENCES 21
GENERAL PROVISIONS 22
DEFINITIONS AND SAMPLE DESIGN GUIDELINES 22
Sidewalk Facilities *22*
Paved Shared-use Paths *24*
On-Street Bike Routes *28*
Paved Shoulders and Multiuse Lanes *28*
ADDITIONAL DESIGN AND LOCATIONAL CONSIDERATIONS 34
Shared-use and Sidewalk Path Facilities *34*
Grade Acceptability *34*
RIGHT TURN CONSIDERATIONS 36
Single Right Turn Lanes *36*
Single Right Turn Lane and Through/Right Turn Lane *36*
Dual Right Turn Lanes *36*
Free Right Turn Lanes *36*
MAINTENANCE CONSIDERATIONS 39

6. IMPLEMENTATION **42**

INTRODUCTION 42
COST ESTIMATES 42
FUNDING OPPORTUNITIES 45
IMPLEMENTATION STRATEGIES AND RESPONSIBILITIES 47

7. CONCLUSION **65**

ACHIEVING THE VISION 65

Table of Exhibits

Exhibit 1 Pedestrian Plan 15

Exhibit 2 Bicycle Plan 16

Exhibit 3 Sidewalk Typical Design Treatment on Collector and Arterial Roadways 23

Exhibit 4 Shared-use Path Typical Design Treatment 25

Exhibit 5 Shared-use Path Intersection Design Concept 26

Exhibit 6 Raised Median Refuge for Shared-use Path and Crosswalk 27

Exhibit 7 Traffic Calming Elements 29

Exhibit 8 Typical Roadway Cross Sections 32

Exhibit 9 Recommended Signs 33

Exhibit 10 Grade Acceptability for Pedestrian and Bicycle Facilities 35

Exhibit 11 Recommended Intersection Treatment for Paved Shoulder/Multiuse Lane 37

Exhibit 12 Recommended Intersection Treatment for Dual Right Turn Lanes (Only where Dual Right Turn Lanes are Warranted) 38

Exhibit 13 Construction Sign Location Off Pavement 40

Exhibit 14 Wide Curb Lane Through Construction Area 41

Exhibit 15 Planning-Level Cost Estimates, Yr 2000-2010 Pedestrian and Bikeway Facilities 42

Exhibit 16 Planning-Level Cost Estimates; Yr 2000-2010 Pedestrian and Bikeway programs 43

Exhibit 17 Potential Funding vs. Cost Scenario 44

Exhibit 18 Implementation Strategies 50

1. INTRODUCTION

Overview

Walking and bicycling have many public and private benefits, including providing a means of transportation, fitness and recreation, reducing the need to build and maintain new roadways and improving air quality. The *Town of Oro Valley Pedestrian and Bicycle Plan* charts a course into the 21st century to improve pedestrian and bicycle opportunities within our community for people of all abilities. This first-ever pedestrian and bicycle plan for the Town presents a vision for a safer, more enjoyable pedestrian and bicycle environment within the Town of Oro Valley, and describe the process to achieve it.

The *Oro Valley Pedestrian and Bicycle Plan* was developed during the spring of 1999 by a Steering Committee consisting of Town staff and citizen representatives from the community, with the assistance of a transportation consulting team. In addition to the advice provided by the citizen representatives to the committee, the plan incorporates public comments received at two public open houses held during the plan's development. Involvement by citizens, Town staff, walking and bicycling advocates, and other stakeholders within the community has resulted in the development of a plan that is both desirable and achievable.

Shared-use paths provide benefits to all users

Background and Purpose

The *Oro Valley Pedestrian and Bicycle Plan* has its origins in the planning process undertaken in 1996 to develop the *Town of Oro Valley General Plan*. The General Plan set the stage for the development of a pedestrian and bicycle plan by establishing a major goal to "Ensure safe, convenient and efficient vehicular and non-motorized traffic circulation to serve both within and through the community."

Based upon this goal and requests from Oro Valley citizens for a more pedestrian and bicycle-friendly community, the Town has set forth to achieve this vision. The *Oro Valley Pedestrian and Bicycle Plan* provides guidance to develop more and safer

pedestrian and bicycle facilities, improve traffic education and enforcement programs, improve land use and development practices which encourage walking and bicycling, and provide promotional programs and support facilities for pedestrian and bicycle travel and recreation.

This plan focuses on "urban" pedestrian and bicycle elements. sidewalks and other suitable paved pedestrian facilities; paved shared-use paths for pedestrians, bicyclists, in-line skaters or "rollerbladers", people with disabilities, and other users; signed and striped bicycle routes on local Town streets; and paved multiuse lanes and shoulders on collector and arterial roadways.

Although it does not directly address unpaved walking, hiking, equestrian, and mountain bike trails in the community, the plan does consider and incorporate the interface with these trails. The *Oro Valley Pedestrian and Bicycle Plan* complements the Town's *Parks, Open Space, and Trails Master Plan (POST),* completed in 1994, which provides a comprehensive plan for the unpaved trail system throughout the Town. In addition, the ongoing *Pima-Pinal Trails Study* will soon be completed and will provide a regional trails plan which will tie in with as well as incorporate Oro Valley's unpaved trail system.

As one of the fastest growing communities in Arizona and with a population over 26,000, the time is right to establish an institutional framework to promote walking and bicycling as legitimate and desirable activities. The *Oro Valley Pedestrian and Bicycle Plan* is the result of foresight of Oro Valley citizens to promote the planned growth of walking and bicycling as a major contribution to the high quality of life in their community.

Urban pedestrian and bicycle facilities will connect to the unpaved trail system

Organization of the Pedestrian and Bicycle Plan

Following this Introduction, the *Oro Valley Pedestrian and Bicycle Plan* is divided into six additional chapters. Chapter 2 presents the Vision, Goals and Objectives of the plan. This section maps the direction and strategies that should be pursued to improve walking and bicycling within the Town of Oro Valley, as well as provides elements by which the plan's progress and success can be measured over time.

Chapter 3 provides a review of Town and regional plans and programs and discusses how they promote or discourage walking and bicycling within the Town. Elements from this review as well as steering committee and public input have been used to develop the pedestrian and bicycle facility plans, also presented in this chapter. The facilities, intended to be developed in three implementation stages from year 2000 to year 2010, include sidewalks, enhanced pedestrian crossings, trailheads/parking areas, bicycle routes, multiuse lanes available for bicycling, and off-street shared-use paths for pedestrians, bicyclists, and other users.

Chapter 4 presents support facilities and programs necessary to promote bicycling and walking. Such support facilities and programs include rest areas and "watering stops", bicycle racks and lockers, and promotional programs such as "Bike and Walk Week". Programs that are intended to improve education and enforcement of motorists, pedestrians, and bicyclists are discussed.

Chapter 5 describes general design guidelines for development of pedestrian and bicycle facilities. Sample designs are included for implementing improved pedestrian and bicycle crossings of major roadways, high-standard intersection and roadway treatments for multiuse lane facilities, and appropriate treatments for development of shared-use path facilities that must accommodate a wide range of users including pedestrians, bicyclists, rollerbladers, and others.

Chapter 6 provides the implementation plan that includes the priority listings for the development of pedestrian and bicycle facilities within the community. This section presents the near, middle, and long-term implementation programs for the plan. Also included within this section are planning-level cost estimates for the development of the identified facilities and programs, and a funding strategy to ensure completion of the plan.

Chapter 7 concludes with a summary of the elements and steps necessary to achieve the vision of the *Oro Valley Pedestrian and Bicycle Plan*. The vision, described in the following chapter, will be reached through the concerted and sustained efforts of Town of Oro Valley staff and residents.

2. GOALS AND OBJECTIVES

Plan Vision

A key element in the development of the *Oro Valley Pedestrian and Bicycle Plan* is the establishment of an overall theme or vision for the Town to follow as it improves the quality of travel and recreational opportunities for its citizens and visitors. The vision of the *Oro Valley Pedestrian and Bicycle Plan* is to:

"Develop and promote the Town of Oro Valley as An Outstanding Pedestrian and Bicycle-Friendly Community."

This vision is highly desirable to improve the overall quality of life for Oro Valley residents and visitors. Communities with pedestrian and bicycle amenities are increasing in popularity nationwide.

A recent study of American homebuyers by a market research firm for major home builders found that readily accessible bike and walking paths and natural open spaces were among the highest priorities for homebuyers *(American Lives, Inc., 1999)*. Also, the City of Scottsdale in 1998 commissioned a survey which found that 7 percent of its tourism dollars comes from bicyclists—a surprisingly high figure considering the City does not market bicycling as a tourism activity. Locally, the City of Tucson in 1997-98 conducted the year-long Livable Tucson Vision Program and found that the Number One vision was *"Viable and Accessible Alternatives to Automobile Transportation."*

People (and animals) are looking for safe places to walk!

Numerous steps will be necessary along the way to bring the *Oro Valley Pedestrian and Bicycle Plan* to success and achieve the vision. With assistance from the public, the steering committee developed six key goals and several supporting objectives to carry out the plan. These goals and objectives serve as the guiding steps and, in conjunction with implementing strategies introduced later in this document, will provide the framework for comprehensive pedestrian and bicycle policies, programs, and facilities.

Goal 1: Establish policies which promote walking and bicycling as healthy forms of transportation and recreation.

Objectives

A. Provide a staff position dedicated to pedestrian and bicycle planning.

B. Provide staff training for pedestrian and bicycle transportation planning and design.

C. Establish a Citizens Pedestrian and Bicycle Advisory Committee. Research and model this new committee after existing pedestrian and bicycle advisory committees.

D. Provide incentives to businesses, schools, and agencies to promote walking and bicycling (e.g., racks, lockers, showers). Research successful incentive programs.

E. Establish a dedicated local funding source for construction and maintenance of pedestrian and bicycle facilities. Allocate funds and/or require developer contributions for construction of pedestrian and bike facilities.

F. Actively pursue Federal Surface Transportation Program, Transportation Enhancement, and other Federal and State grant funding for both on-road and off-road pedestrian and bicycle facilities and unpaved trails.

Goal 2: Develop and maintain continuous and interconnected pedestrian and bikeway systems.

Objectives

A. Identify and secure right-of-way along roadways, major and minor watercourses, nature trails, and utility easements.

B. Prioritize pedestrian and bicycle improvements for a three-mile radius ("hub and spoke" pattern) around employment locations, schools, and activity centers.

C. Eliminate gaps in the pedestrian and bikeway systems when constructing roadway, pedestrian, and bikeway improvements.

D. Construct special pedestrian and bicycle crossings of high volume streets.

E. Monitor the Plan and update it at 3 to 5 year intervals.

Goal 3: Use pedestrian and bicycle-friendly standards, procedures and ordinances for pedestrian/bicycle facilities and roadways, including Crime Prevention Through Environmental Design principles to improve security.

Objectives

A. Incorporate pedestrian and bicycle friendly standards in major roadway improvements.

B. Provide pedestrian and bicycle facilities as part of routine roadway maintenance and improvements.

C. Prioritize and provide spot pedestrian and bicycle safety improvements including paved shoulders, sidewalks, enhanced crosswalks, lighting, signage, striping, and other elements based on safety reviews and community input.

Goal 4: Develop and implement Town-supported programs to encourage pedestrian and bicycle usage and safety.

Objectives

A. Implement a comprehensive program to increase public awareness of the benefits of walking and bicycling.

B. Educate drivers, pedestrians and bicyclists on legal, safe, and predictable traffic behavior.

C. Implement a traffic law enforcement program for pedestrians, bicyclists, and motorists.

D. Implement a user-responsive maintenance program to provide high-standard maintenance of roadways, pedestrian facilities, and bicycle facilities.

Goal 5: Develop and maintain databases useful for pedestrian and bicycle planning, prioritization of improvements, and accident prevention.

Objectives

A. Develop and maintain a pedestrian and bicycle route inventory.

B. Establish and maintain a pedestrian and bicycle accident database.

C. Conduct pedestrian and bicycle counts on an annual basis throughout the Town.

D. Periodically conduct public opinion surveys on walking and bicycling and how to better improve conditions for pedestrians and bicyclists.

Goal 6: Encourage land uses which foster pedestrian and bicycle travel.

Objectives

A. Working with Town planners and private developers, promote mixed-use developments which incorporate residential, commercial, work, and recreational uses and thereby help reduce the need for longer-distance automotive trips.

B. Emphasize pedestrian and bicycle facilities within and between developments to encourage walking and bicycling as major modes of travel.

C. Promote traffic calming within developments through the use of traffic circles, speed humps, diverters, and other measures to encourage slower traffic speeds.

These identified goals and objectives will serve as complimentary and essential elements in making the Town of Oro Valley *"An Outstanding Pedestrian and Bicycle-Friendly Community."* These elements are critical to the success of the plan along withthe implementation of an extensive network of pedestrian and bicycle facilities, as described in the following chapter.

3. Pedestrian and Bicycle Plan

Introduction

The purpose of this chapter is to present the physical plan for the *Oro Valley Pedestrian and Bicycle Plan*. The plan includes the designation of four types of facilities for pedestrians and bicyclists in Oro Valley, as summarized below. These pedestrian and bicycle facilities are further described in Chapter 5, *Design Standards*.

- Sidewalk facilities, typically 4 foot to 6 foot wide concrete sidewalks on one or both sides of the roadway
- Paved shared-use paths, typically 10 foot to 12 foot wide asphalt pavement along washes, roadways, or separate easements
- On-street bike routes, typically on local streets with 12 foot to 15 foot wide shared-use travel lanes
- Paved shoulders and multiuse lanes, typically 5 foot to 10 foot wide lanes on both sides of collector and arterial roadways

As part of the development of the plan, existing pedestrian and bicycle facilities within the Town were inventoried and documented. These facilities are discussed in the following section.

A review of related plans and programs of the Town of Oro Valley and other jurisdictions including Pima County, the Pima Association of Governments, the Arizona Department of Transportation, and the City of Tucson is also provided within this chapter. The purpose of this review was to determine which provisions within the plans and programs already support walking and bicycling within the Town, which are relevant from other jurisdictions, and which need to be modified or added to improve conditions for walking and bicycling. Guidance to improve the provision of pedestrian and bicycle facilities is provided within the following chapters.

In addition, public involvement was essential to development of the plan, provided through the direction of the project steering committee and through input from residents of the Town received at two public open houses for the plan. This involvement was critical in establishing the future pedestrian and bikeway system, provided by people who best know the existing traveled ways, needs, and desires of those who wish to walk and bicycle within the community.

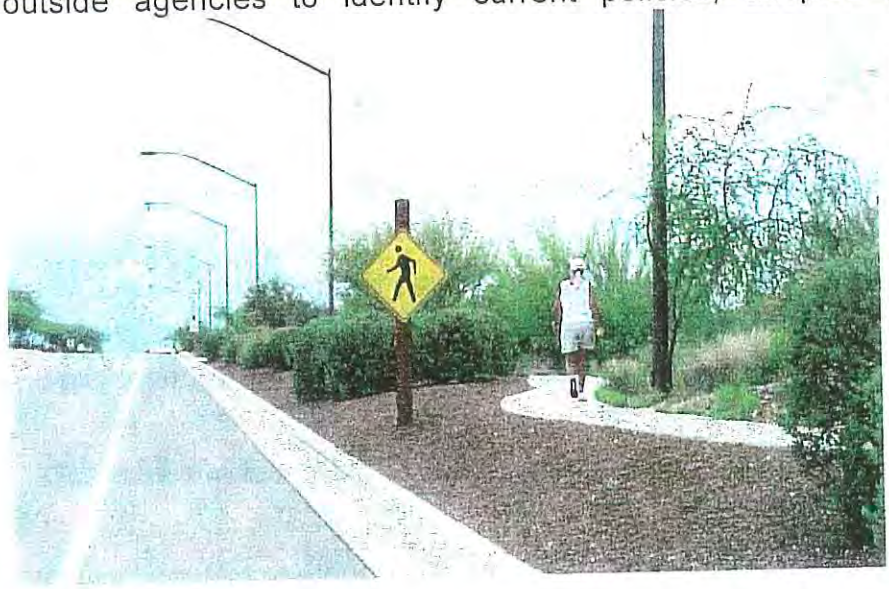
Existing Conditions

Existing pedestrian and bicycle facilities within the Town range from non-existent along most major roadways to the high-standard pedestrian and bicycle facilities provided within Rancho Vistoso. There are a total of approximately 18 linear miles of sidewalk along collector and arterial roadways within Town limits, over 20 miles of multiuse lanes and paved shoulders (including 9 miles of paved shoulders on Oracle Highway and

Tangerine Road, maintained by the Arizona Department of Transportation), and less than 0.25 miles of off-street shared-use paths.

Summary Review of Related Plans and Programs

The purpose of this task was to work with Town staff, the steering committee, and outside agencies to identify current policies, adopted plans, and improve-ment programs related to pedestrian and bicycle travel within the Town and its sphere of influence. As part of this effort, policies and programs were evaluated with respect to pedestrian and bicycle access, safety, and facility needs. This task also evaluated current Oro Valley and comparative Pima County and City of Tucson design requirements for pedestrian and bicycle facilities.



Existing sidewalks, multiuse lanes, landscaping, and arterial street lighting along Rancho Vistoso Boulevard

Fifteen principal docu-ments were reviewed which relate to pedestrian and bicycle travel in the Town of Oro Valley and its environs. Provided in the appendix are the key findings, including recommendations and requirements, from the fifteen documents.

The review of related plans and programs determined that pedestrian and bicycle programs and facilities are highly recommended and in several cases required in the construction or widening of roadways and construction of residential and commercial developments. This is true both within the Town of Oro Valley as well as within neighboring jurisdictions.

Several projects in Oro Valley which will include pedestrian and bicycle facilities are contained within the current Pima Association of Governments Transportation Improvement Program, and will be built over the following five years. Other projects which include pedestrian and bicycle facilities, as listed within the Metropolitan Transportation Plan, are planned to be constructed over a 20-year period.

Overall, support for walking and bicycling is strong within existing Town of Oro Valley standards, policies and programs. Additional guidance to improve upon the provision of pedestrian and bicycle elements is provided in the following chapters, *Support Facilities, Design Standards,* and *Implementation Plan.*

Public Input

The major contribution to the development of the plan has come through the involvement of the plan steering committee and residents of the Town of Oro Valley. The steering committee met on a bi-weekly basis over much of the nine-month development of the plan. Two public open houses were held, one at the grand opening of a major retailer within the Town and another at the Town's 25th Anniversary celebrations held at Dennis Weaver Park.

Approximately 800 people visited the pedestrian and bicycle plan table at the first open house held in March 1999. The intent of the first open house was to inform the public that the plan was in progress and to solicit recommendations. There were 88 people who filled out a questionnaire on walking and bicycling and signed up on the mailing list, and an additional 47 people signed up on the mailing list only.

Pedestrian and bicycle plan open house at the Towns 25th Anniversary

Approximately 40 percent of respondents to the questionnaire indicated they would like to have more bicycle or multiuse lanes in Town, about 35 percent indicated they would like to have more shared-use paths, and the remaining 25 percent suggested lighting, reduced speed limits, sidewalks, safety, security, and other improvements.

The second open house, held in April, presented the draft pedestrian and bicycle system maps and included a second questionnaire soliciting input on the maps and funding priorities. Visitors were also able to draw directly on maps to indicate where additional pedestrian and bicycle facilities should be implemented.

Approximately 300 persons came by the pedestrian and bicycle plan table, and 41 people filled out questionnaires. Three-quarters of the people who filled out questionnaires indicated the draft pedestrian system map adequately addressed pedestrian needs, and 27 indicated that the draft bicycle system map adequately addressed bicycle needs. Numerous comments were received on how to improve the pedestrian and bicycle system.

Additionally, respondents indicated that facilities and funding for pedestrians and bicyclists should be increased. Provided below is a summary of the responses which indicated either "High" or "Very High" importance for items relating to walking and bicycling:

- 86 percent of respondents strongly supported increasing construction of bicycle facilities
- 74 percent of respondents strongly supported increasing roadway, bicycle, and pedestrian facility maintenance
- 67 percent of respondents strongly supported increasing funding for walking and bicycling
- 58 percent of respondents strongly supported increasing construction of pedestrian facilities
- 56 percent of respondents strongly supported improving public safety (i.e., police and emergency response services)

Full summary results and additional details from the two public open houses are presented in the appendix.

Pedestrian Facility Plan

As a result of the active involvement of the steering committee and the public, a pedestrian facility plan was developed to improve and provide for pedestrian travel throughout the Town. Many needs were identified and recommendations given to achieve the following criteria for the facility plan. These primary criteria address the physical elements called for within Chapter 2, *Goals and Objectives:*

- Improve pedestrian system continuity
- Provide access for people of all abilities
- Increase safety at crossings of major roadways
- Provide opportunities for people to walk to destinations such as work places, shopping, and activity centers rather than to have to drive
- Improve recreational opportunities for pedestrians
- Improve access for children to walk to schools, parks, and other important destinations for youth

Planned pedestrian facilities are shown on Exhibit 1 located at the back of this chapter. The exhibit is a map which includes planned sidewalks, shared-use paths, enhanced pedestrian crossings, trailheads with parking facilities, and connections with the unpaved trail system. Sidewalk facilities included within this plan are to be located along collector and arterial roadways. This plan does not address neighborhood sidewalk facilities, which are required to be built by developers in most new Oro Valley neighborhoods.

As part of the planning process, priorities were established by the steering committee for project phasing. Projects were divided into three implementation periods: Years 2000 through 2002, 2003 through 2006, and 2007 through 2010. It is important to note that that this plan is recommended to be updated within three to five years, and that priorities for pedestrian facility phasing will likely undergo change as the plan is updated.

Based on the planned facilities, approximately 27 linear miles of new sidewalk will be built along collector and arterial roadways, to total over 45 linear miles of sidewalk by 2010. Many additional miles of sidewalk will also be built on local streets by developers as part of new development. In addition, over 9 miles of shared-use path will be constructed by 2010 and a minimum of 14 enhanced pedestrian/bicycle crossings.

Specialized signal for pedestrians and bicyclists in central Tucson

These crossings include raised median refuges, specialized traffic signals, street level lighting to improve the ability of motorists to see pedestrians and bicyclists, high visibility crosswalks, and other measures to improve the safety of crossings.

Many of the pedestrian facilities will be built as part of roadway improvement projects, or "piggybacked." Also, the shared-use path along the Cañada del Oro Wash (approximately 2.4 miles) will be built by Pima County, and short sections of sidewalk and shared-use path can be built by developers. Additional levels of funding, as discussed in Chapter 6, *Implementation,* will be necessary to complete the entire pedestrian network.

Bicycle Facility Plan

Similar to the pedestrian plan, the bicycle facility plan resulted primarily from steering committee direction and public input. The plan sets forth a comprehensive network of facilities to meet long-standing as well as future needs. The primary criteria for the bicycle facility plan are similar to those for the pedestrian plan:

- Improve bicycle system continuity
- Provide access for people with disabilities (on shared-use paths and at street crossings)
- Increase safety at crossings of major roadways
- Provide opportunities for people to bicycle to destinations such as work places, shopping, and activity centers rather than to have to drive
- Improve recreational opportunities for bicyclists
- Improve access for children to bike to schools, parks, and other important destinations for youth

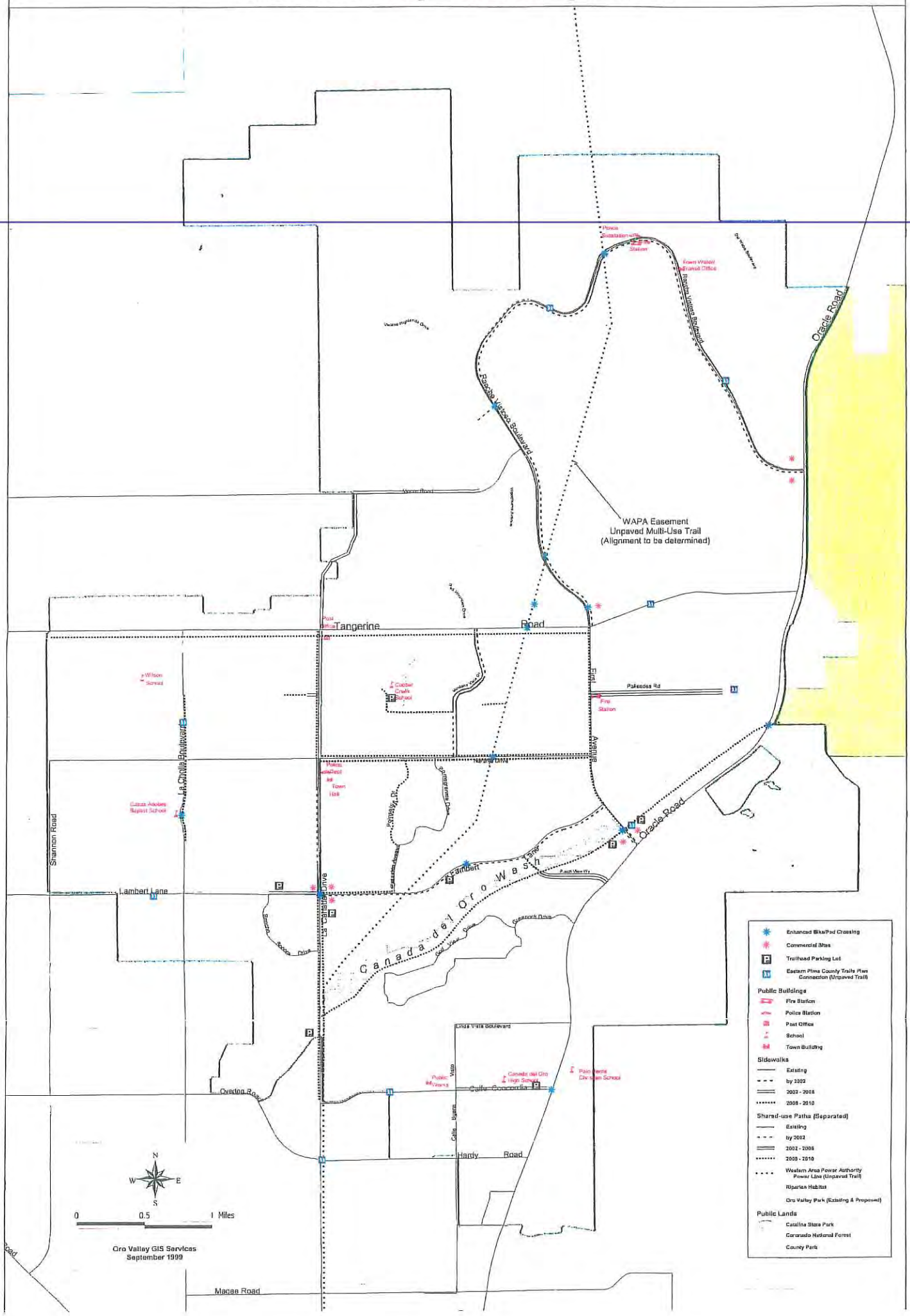
Planned bicycle facilities are presented within Exhibit 2. The map shows planned shared-use paths (the same as are in Exhibit 1), multiuse lanes/paved shoulders, local street bike routes, enhanced crossings of major roadways, trailheads with parking facilities, and connections with the unpaved trail system.

Projects were divided into the same three implementation periods as the pedestrian plan: Year 2000 through 2002, 2003 through 2006, and 2007 through 2010. Priorities for bicycle facility phasing will likely undergo change as the plan progresses.

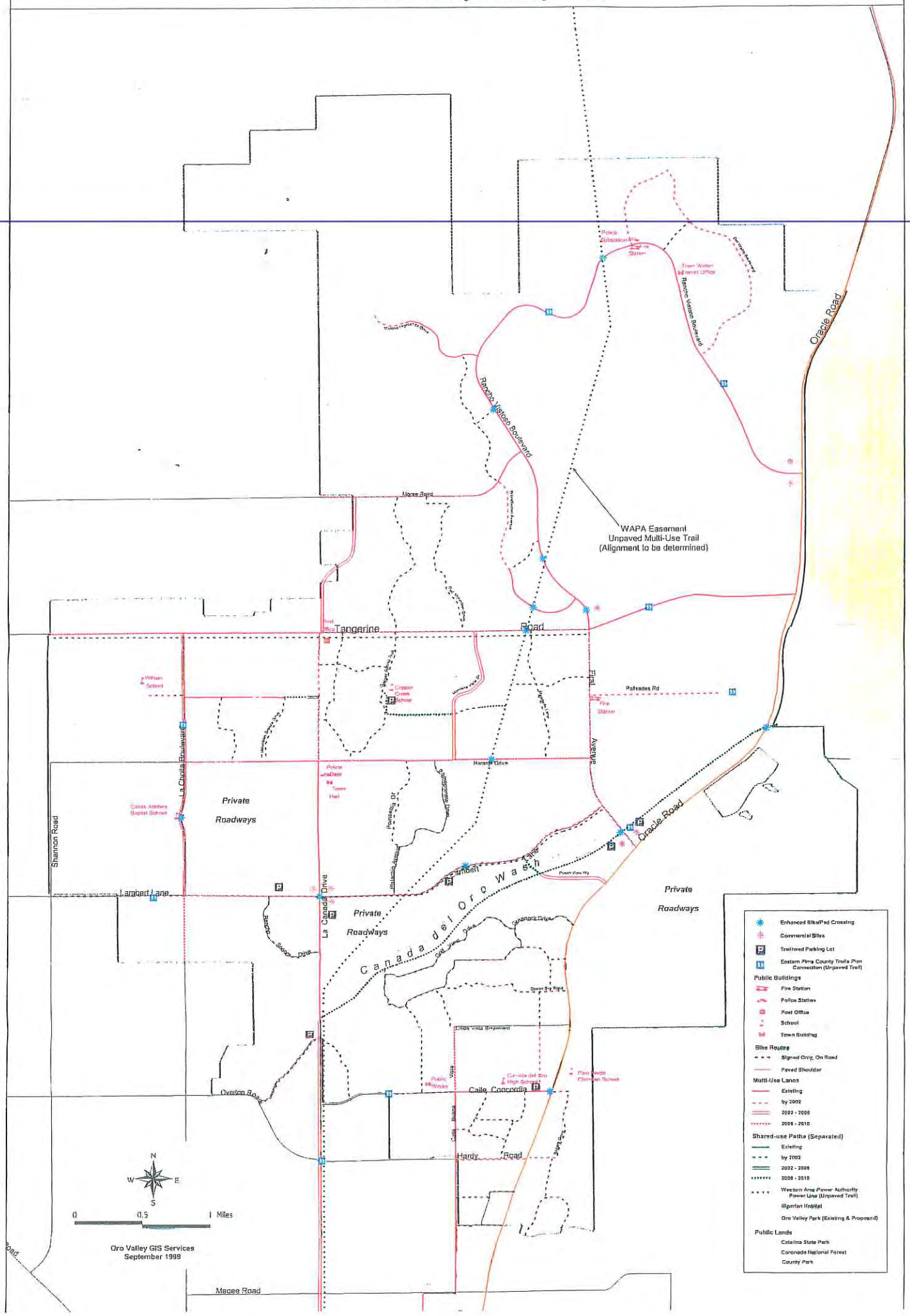
Based on the planned bicycle facilities, approximately 30 miles of bicycle routes on low-speed local streets, about 20 miles of new multiuse lanes and paved shoulders on collector and arterial roadways, and 9 miles of off-street shared-use paths (the same paths identified in the pedestrian network) will be built throughout the community by 2010. Several enhanced pedestrian/bicycle crossings as discussed above and trailheads with parking are also planned.

Many of these facilities will be built as part of roadway improvement projects, and some others will be built by Pima County and developers. Additional funding will be necessary to fully develop the planned bikeway network. Project costs, phasing and funding are further discussed in Chapter 6, *Implementation*.

Town of Oro Valley Pedestrian System Plan



Town of Oro Valley Bikeways Plan



4. SUPPORT FACILITIES AND PROGRAMS

Introduction

There are a number of pedestrian and bicycle support facilities and programs that effectively promote walking and bicycling. These support facilities and programs complement the physical pedestrian and bicycle network, helping people walk and bicycle for many of their daily activities. Following is a description of the key support elements and their application to pedestrian and bicycle travel.

Pedestrian and Bicycle Support Facilities

Pedestrian and bicycle support facilities may be defined as physical facilities which aid walkers and cyclists in finding their way, providing shade, water and areas to rest, and helping walkers and cyclists when they reach their destination, such as through the provision of safe bicycle parking. Support facilities can be almost as important in attracting and providing for pedestrians and cyclists as having sidewalks, shared-use paths, and paved shoulders themselves. Key support facilities include:

- ***Bicycle Parking:*** Bicycle parking, as with automotive parking, is important if use by this mode is expected and desired. Bicycle parking includes Class 1 and Class 2 facilities. Class 1 facilities provide long-term parking, and include bicycle lockers, check-in facilities, monitored parking, restricted access parking, or other means. Class 2 parking is short-term, and typically include bicycle racks to which the bicycle frame and wheels can be attached. Placement of bicycle parking in well-lit areas and in the front of destinations is imperative for safe and secure use.
- ***Water and Rest Stops:*** Water and rest stops are generally provided for pedestrians and bicyclists along sidewalks and shared-use paths, but may also be provided in areas served by on-street bicycle facilities. These stops are very helpful for traveling in the desert, and can provide a "focal point" with public art for bikeway and walkway users. The stops serve to break up the travel distances, and if outfitted with adequate shade can contribute to the enjoyable experience of using bikeways and walkways. The stops can also include restrooms, "pocket" parks, interpretive sites, and parking areas.
- ***Trailheads/Parking Areas:*** These facilities, generally located along shared-use paths, provide important support for pathway users who either prefer or must drive to the paths, including rollerbladers and families. Parking areas can be combined with parks and other public facilities, as mentioned above. In limited instances, parking areas can serve as "park and ride" lots for people traveling to locations or special events with limited parking.

- ***Landscaping:*** The provision of plants and particularly of trees is highly important to the success of sidewalk and shared-use paths, and contribute as well to the attractiveness and the ability to use multiuse lanes and paved shoulders. The landscaping element is often the most overlooked and underfunded item in the design of pedestrian and bikeway systems. The provision of shade trees in groupings along a pathway, or if possible the provision of a "corridor" of shade trees, greatly increases the enjoyment of the pathway. It is important that transportation safety and security design principles are followed carefully in the design and placement of landscaping elements.

Landscaped rest areas and parking are important support facilities to encourage use of paths and bikeways

There are numerous other items which may be considered valuable support facilities to help people walk and bicycle. These facilities range from bicycle and pedestrian maps, bicycle commuter and safety publications, walking and bicycling clubs, showers and lockers, "Share the Road" and pedestrian caution signing, and a number of other helpful provisions. As the *Oro Valley Pedestrian and Bicycle Plan* is implemented and as public interest in walking and bicycling grows, these and other support facilities will naturally become standard elements in the development of the pedestrian and bikeway systems.

Pedestrian and Bicycle Support Programs

Pedestrian and bicycle support programs are important in "advertising" walking and bicycling as healthful activities; encouraging people to commute and make short utilitarian trips by walking and bicycling; encouraging students to use alternate modes; helping large employers meet regional travel reduction goals; and teaching pedestrians, bicyclists, and motorists proper traffic practices to improve safety. Numerous programs and creative ways exist to encourage people to walk and bicycle. Provided below are some key programs which can increase awareness and actively support walking and bicycling:

- ***Bike and Hike Week:*** Special events such as "Bike to Work Day" or a "Bike and Hike" week help raise awareness, increase community involvement, and increase excitement for using alternate modes. These events can often be the stepping stone for people who have long wanted to walk or bicycle more, especially for daily

activities including commuting. Many cities and towns around the nation have long promoted these special events, including the City of Tucson and Pima County, which annually promote "Bus There, Bike There, Walk There" and "Bikefest" weeks. Events such as these within the Town of Oro Valley can either begin as a one-day event or can be jointly held as part of the City and County events.

- ***Travel Reduction/Alternate Mode Encouragement Programs:*** These programs are offered on a continual basis throughout the year, and are generally run as part of regional efforts within metropolitan areas to meet or exceed air quality goals. Within the Tucson metropolitan area, the Pima Association of Governments (PAG) administers a travel reduction program, which is primarily targeted at employers with 100 or more employees per employment site.

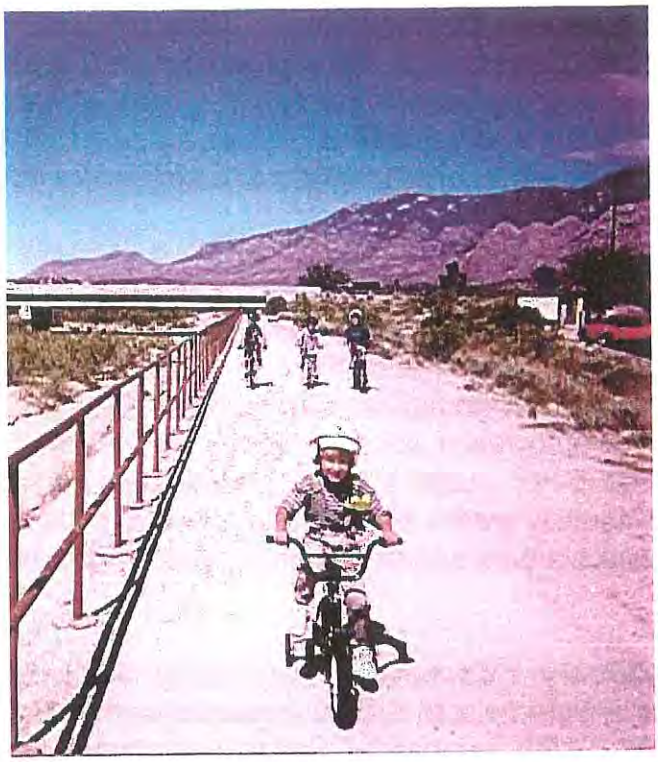
  The program, which may also be joined voluntarily by employers with less than 100 employees at a site, provides information and incentives to encourage employees to carpool, telecommute, work compressed work weeks, take the bus, walk, bicycle, and use other means to reduce their travel or to change how they travel. Within the environs of the Town there are some employers such as Allied Signal which currently participate in the program. The Town could actively participate in and promote the existing program, and could actively work with employers with less than 100 employees and with public and private schools to promote the use of alternate modes.

- ***Citizen's Pedestrian and Bicycle Advisory Committee:*** A citizens advisory committee is essential to supporting the programs and facility development of the Town, and serve as the "eyes and ears" of the community which help determine pedestrian and bicycle priorities. A regional committee named the Tucson-Pima County Bicycle Advisory Committee has been in place since 1986 and was instrumental in getting the City and County to adopt bicycle facilities within the standard roadway cross section for all new or reconstructed major roadways.

  Also, the City of Tucson established the Citizens Transportation Advisory Committee in the mid-1980s, which has provided important recommendations to the City on pedestrian, transit, and other transportation issues. The Town of Oro Valley can build upon the experience of these committees to form a single pedestrian/bicycle advisory committee which can adequately serve the Town's needs.

- ***Education and Enforcement Program:*** Education and enforcement programs round out the "Four E's" of pedestrian and bicycle planning—Engineering, Encouragement, Education, and Enforcement. Construction of facilities and promotion of alternate modes through special events are extremely important but are less effective unless pedestrians, bicyclists, and motorists learn and follow the rules of the road to their best ability.

The Federal Highway Administration estimates that from kindergarten through 12th grade, less than $1 is spent annually per pupil in the public school system on pedestrian and bicycle safety training (*Pedestrian and Bicyclist Safety and Accommodation,* National Highway Institute, FHWA, 1996). Development of a strong "SafeKids" or "BikeEd" program within Oro Valley public and private schools would not only increase safety for young pedestrians and bicyclists, but should lead to better understanding and driving habits for the students as they become licensed drivers.



Encouraging and educating children about walking and bicycling is key to an outstanding community

Promotion of helmet use by bicyclists, including the adoption of a helmet ordinance by the Town, should also be a primary focus. Research of successful helmet promotion programs and helmet ordinances, such as the one in place in the City of Tucson, would provide the Town a strong foundation for an effective helmet program.

Enforcement programs which focus on the primary bicycling offenses which result in accidents—running stop signs and red lights, riding at night without a light, riding the wrong way on the roadway, and riding on sidewalks—is necessary to improve safety as well as to demonstrate that the Town takes this mode of transportation seriously.

Pedestrian offenses such as jaywalking should also be addressed. Enforcement of speeding, running of stop signs and red lights, unsafe passing, failure to yield, and aggressive driving is also essential to "level the playing field" for bicyclists and pedestrians as well as improve safety for all users of the roadways.

In summary, numerous support facilities and programs exist which can effectively promote walking and bicycling. These key facilities and programs described above, as well as many others utilized by cities and towns around the country, can provide a strong foundation for attaining the vision of the *Oro Valley Pedestrian and Bicycle Plan.*

5. DESIGN GUIDELINES

This chapter presents sample design guidelines for pedestrian and bicycle facilities. Provided below is a summary of selected state and national references and general provisions for use in pedestrian and bicycle design. Definitions and general design guidelines for each type of facility are then discussed in the following section. The chapter concludes with recommendations for improved maintenance practices.

References

Selected design standards have been prepared for urban pedestrian and bicycle facilities contained within the *Oro Valley Pedestrian and Bicycle Plan*. These design standards are intended to address certain circumstances related to non-motorized travel and safety, and do not address all elements. For additional information, the most recent version of the following resources are recommended for non-motorized facility standards and guidelines:

- *Guide for the Development of Bicycle Facilities*. American Association of State Highway and Transportation Officials (AASHTO), 1999.
- *Recommended Practice on the Design and Safety of Pedestrian Facilities.* Institute of Transportation Engineers (ITE), 1998.
- *Arizona Bicycle Facilities Planning and Design Guidelines.* Arizona Department of Transportation (ADOT), 1988.
- *Selecting Roadway Design Treatments to Accommodate Bicycles.* Federal Highway Administration, 1994.
- *Pedestrian and Bicyclist Safety and Accommodation.* National Highway Institute, Federal Highway Administration, 1996.
- *Manual on Uniform Traffic Control Devices.* Federal Highway Administration, 1988.
- *Oregon Bicycle and Pedestrian Plan.* Oregon Department of Transportation, 1995.
- *Bikeway Planning and Design.* CalTrans, 1993.
- *Crime Prevention Through Environmental Design (CPTED).* City of Tempe, Arizona, 1996.

These references have been utilized for the development of sample design guidelines presented in this chapter. The references should be directly researched in the planning and design of pedestrian and bicycle facilities.

General Provisions

General provisions for the development of pedestrian and bicycle facilities include the following:

- The AASHTO *1999 Guide for the Development of Bicycle Facilities* serves as the principal resource for the location and design of on-street bicycle facilities and off-street pedestrian/bicycle facilities.

- The guidelines presented in this section of the plan cover the development of sidewalks, off-road paths, and on-road bicycle facilities. The AASHTO guidelines state that *all new roadways which are legal for bicycle use should be designed and constructed under the assumption that they will be used by bicyclists.*

Final design approval of pedestrian and bicycle facilities developed through the use of the guidelines presented below or through the use of other guidelines acceptable to the jurisdictions will be through the authority of the Town Engineer or personnel delegated such authority by the Engineer.

Variances to the pedestrian and bicycle facility guidelines will be considered on a case by case basis based upon factors that demonstrate that public safety and adequate design concerns are covered. Variances will require consultation with the Engineer.

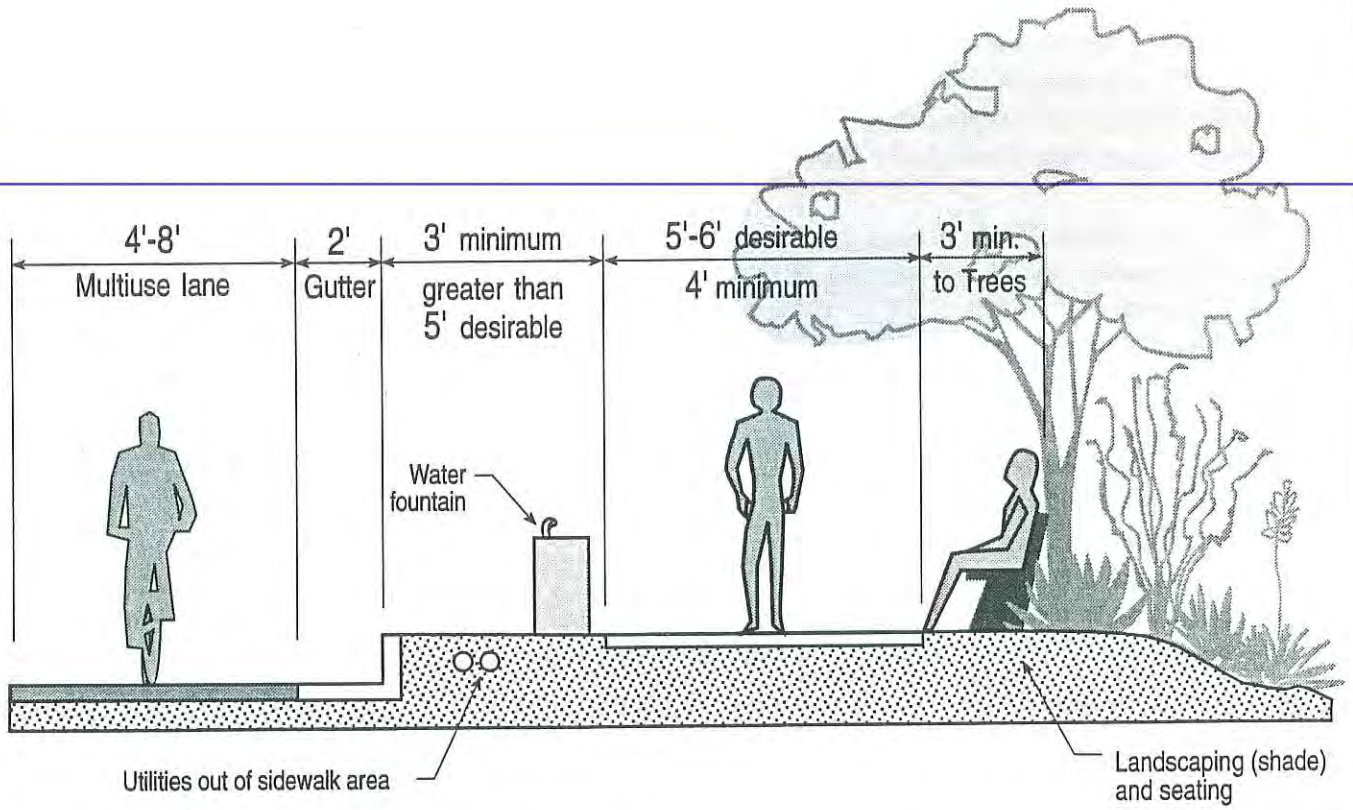
Definitions and Sample Design Guidelines

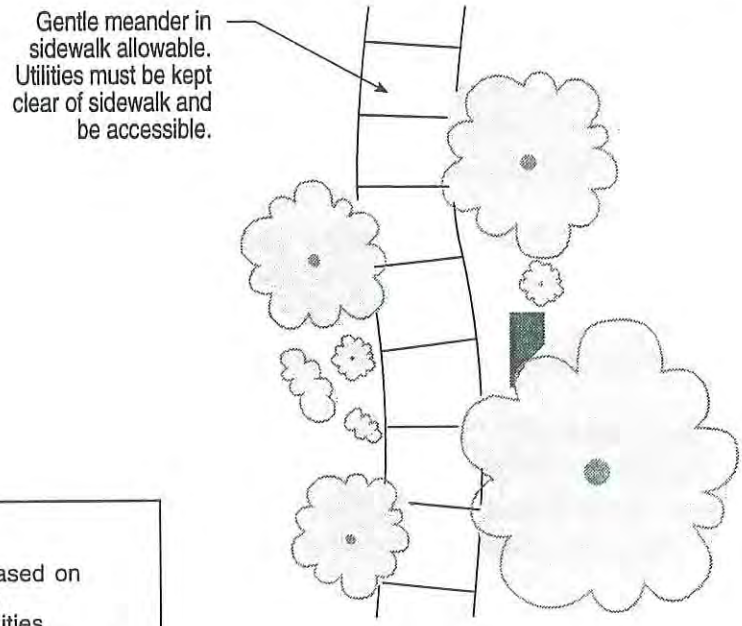
Definitions and sample design guidelines for each facility type included in the *Oro Valley Pedestrian and Bicycle Plan* are as follows:

Sidewalk Facilities

Sidewalk facilities are typically concrete or other suitable hard-surface facilities located in the street right-of-way or within an independent right-of-way including shared use rights-of-way or easements. A minimum width of 4 feet is required for sidewalks, with 5 feet to 6 feet recommended in higher use areas and to better accommodate people in wheelchairs.

Ramps are required for sidewalks where they intersect with crossing roadways. Facilities which support sidewalk use, such as trees and rest stops, should be provided. Sidewalks may be constructed within utility corridors or along washes; however, in such locations consideration should be given to construction of paved shared-use paths to better serve a wider range of users. A typical sidewalk facility cross section is shown in Exhibit 3.





NOT TO SCALE

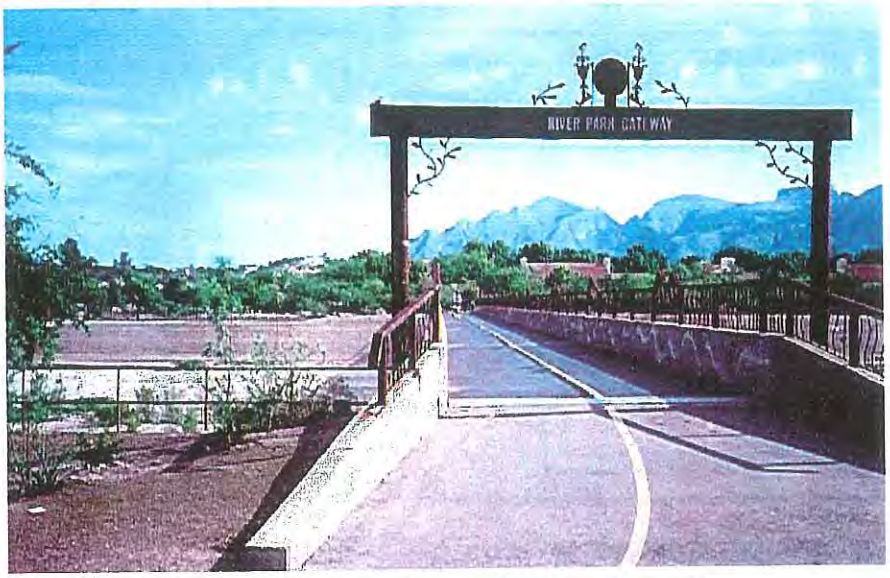
SOURCE: Curtis Lueck & Associates based on 1999 AASHTO Guide for the Development of Bicycle Facilities, 1988 Manual on Uniform Traffic Control Devices, 1995 Oregon Bicycle & Pedestrian Plan, and other references.

EXHIBIT 3
SIDEWALK TYPICAL DESIGN TREATMENT ON COLLECTOR AND ARTERIAL ROADWAYS

Paved Shared-use Paths

A paved shared-use path is an asphalt or other suitable hard-surface pathway physically separated from motorized vehicular traffic by an open space or barrier and either within the street right-of-way or within an independent right-of-way including shared-use rights-of-way or easements (e.g., within utility corridors or along washes).

Paths are expected to accommodate multiple non-motorized uses and should be designed to recommended standards for these uses. The standard width for a path is 10 feet, with 12 feet recommended in areas where a high number of users and/or multiple uses are expected. A minimum 10 feet in vertical clearance should be provided, and minimum of 2 feet clearance on each side of the path should be provided for its length. An additional unpaved path may be constructed parallel to the path in high-use areas to provide pedestrian opportunities separated from bicyclists and rollerbladers.

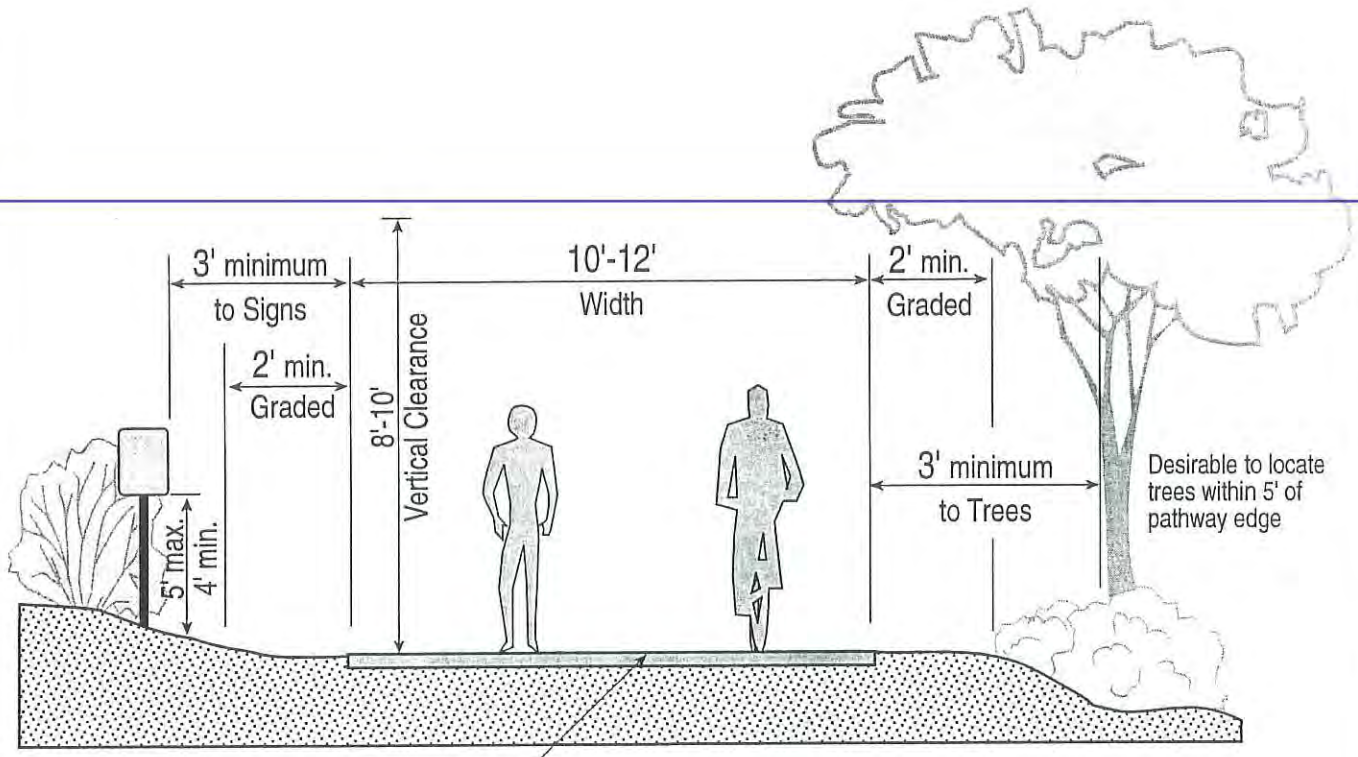


Paved pathways, including bridges, should be at least 10 feet to 12 feet wide

Pathways should be designed with some horizontal curvature but not an excessive number of curves; a pathway with variation is more highly desirable than one which is either entirely straight or has too many curves. A typical shared-use pathway cross section and design concept is provided in Exhibit 4.

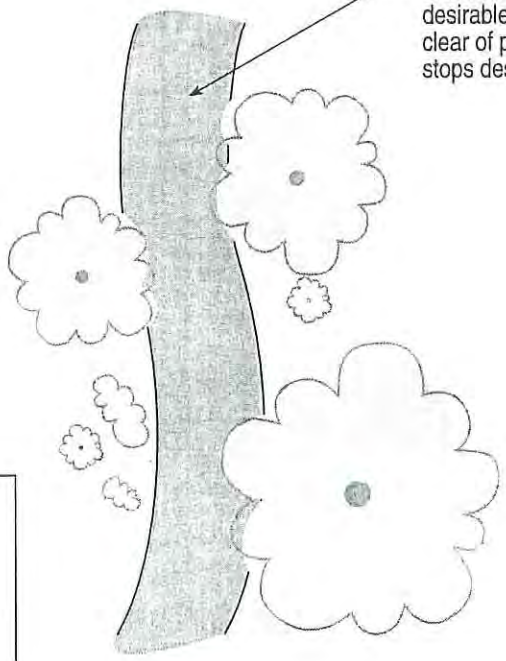
Where paths intersect with roads, improved crossings should be implemented, as shown in Exhibit 5. Where possible, raised or protected median refuge areas should be provided for pedestrians and bicyclists at intersections and mid-block crossings of major roadways, as shown in Exhibit 6.

Traffic signal warrant analyses per the *Manual on Uniform Traffic Control Devices* (MUTCD) or other studies should be conducted for path crossings of major roadways which have been identified as actual or potential high-volume or high-priority pedestrian and bicycle crossings. Documents such as the *AASHTO Guide for the Development of Bicycle Facilities,* the *FHWA Pedestrian and Bicyclist Safety and Accommodation (1996),* and other bicycle/pedestrian guidelines should be researched for design treatments of path crossings of major roadways.



Asphalt concrete or other suitable path material

Gentle meander in pathway is desirable. Utilities must be kept clear of pathway. Water and rest stops desirable.



NOT TO SCALE

SOURCE: Curtis Lueck & Associates based on 1999 AASHTO Guide for the Development of Bicycle Facilities, 1988 Manual on Uniform Traffic Control Devices, 1995 Oregon Bicycle & Pedestrian Plan, and other references.

EXHIBIT 4
SHARED-USE PATH TYPICAL DESIGN TREATMENT

© 1999 CURTIS LUECK & ASSOCIATES TUCSON, AZ

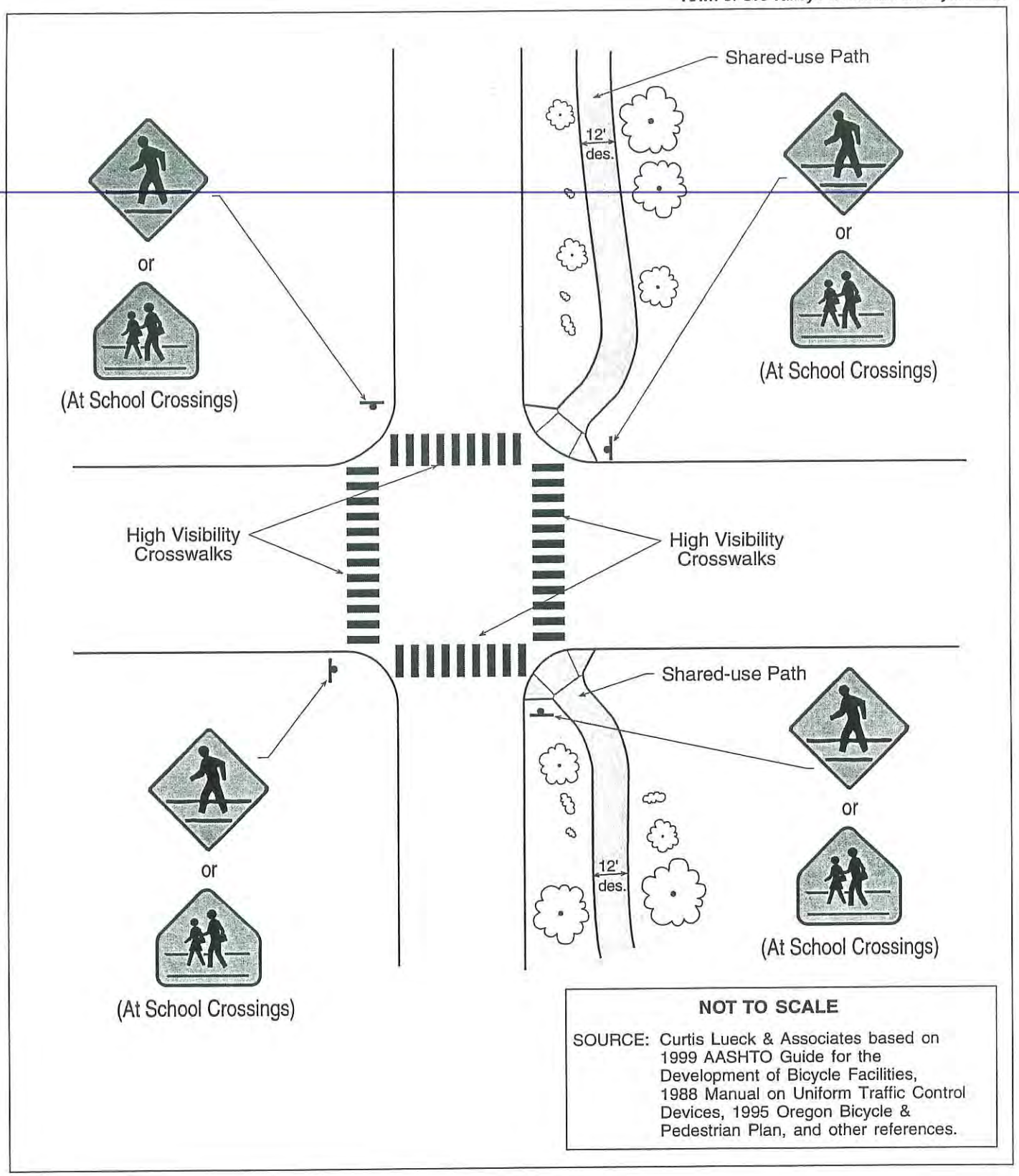
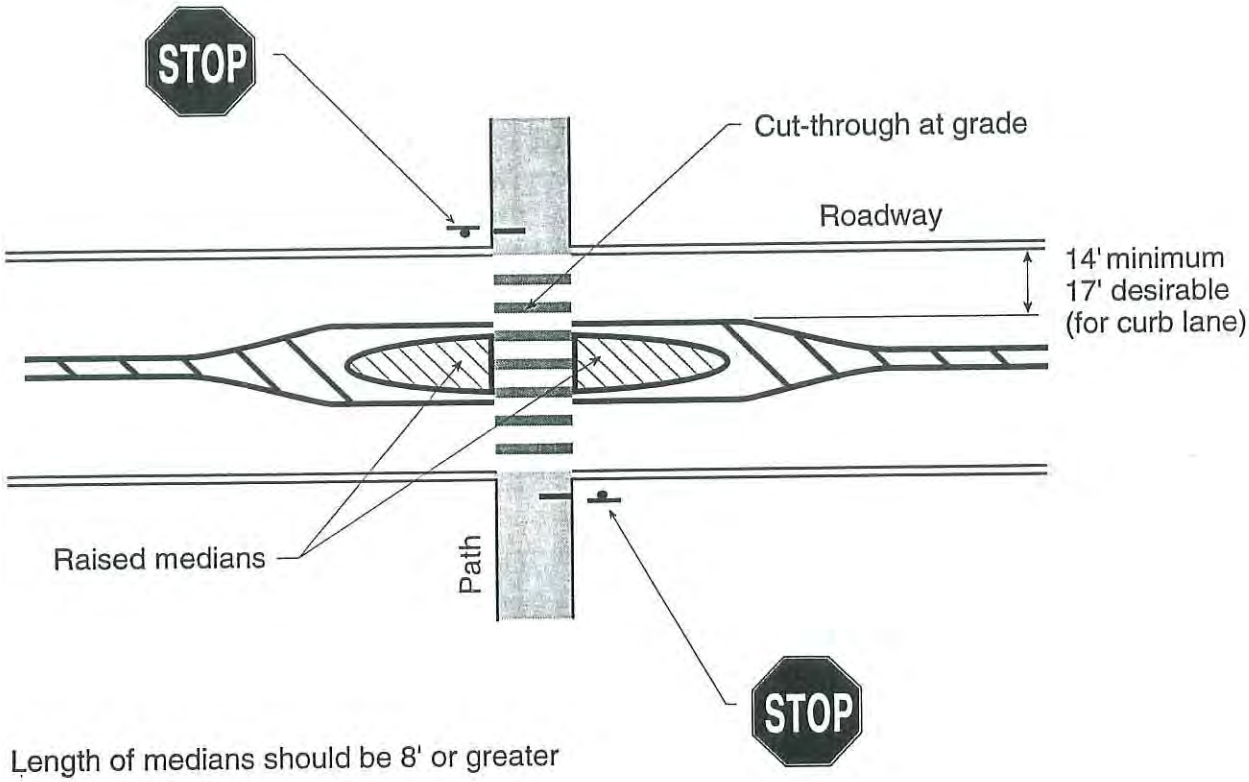


EXHIBIT 5
SHARED-USE PATH INTERSECTION DESIGN CONCEPT

© 1999 CURTIS LUECK & ASSOCIATES TUCSON. AZ



Length of medians should be 8' or greater

Width of median:
10' minimum
14' desirable

NOT TO SCALE

SOURCE: Curtis Lueck & Associates based on 1999 AASHTO Guide for the Development of Bicycle Facilities, 1988 Manual on Uniform Traffic Control Devices, 1995 Oregon Bicycle & Pedestrian Plan, and other references.

EXHIBIT 6
RAISED MEDIAN REFUGE FOR SHARED-USE PATH AND CROSSWALK

© 1999 CURTIS LUECK & ASSOCIATES TUCSON. AZ

On-Street Bike Routes

An on-street bike route is a segment of the bikeway system designated by the jurisdiction having authority as a roadway acceptable for bicycle use. Signed bicycle routes are primarily established on neighborhood or local streets and sometimes on low-volume, low-speed collector streets.

Local streets typically have good conditions for walking and bicycling

Bicycle routes are typically shared-use conditions, with travel lane widths usually varying from 12 feet to 15 feet. Generally, on-street parking is allowed on local streets with lane widths 14 feet or greater. In some circumstances, on-street bicycle routes may be located on older roadways or "traditional urban streets" with lane widths as narrow as 10 feet. (The allowance of "traditional urban streets" with narrow streets may receive future consideration by the Town for certain development conditions.)

Traffic calming provisions such as traffic circles at local street intersections, speed humps, and traffic diverters may be used to enhance the safety of the roadway. Safety is improved for motorists and bicyclists, and often for pedestrians who in some cases must share the roadway space with vehicles due to lack of shoulder area to walk. A bike route enhanced with traffic calming provisions is shown in Exhibit 7.

Paved Shoulders and Multiuse Lanes

Paved shoulders are asphalt concrete shoulders located on uncurbed arterial and collector roadways, and defined by a painted white edge stripe. The standard usable width for paved shoulders is 5 feet from edge of pavement to edge stripe, with 6 feet recommended on roadways with signed speed limits of 40 miles per hour or higher. Under certain conditions, such as on roadways with maximum speed limits of 25 mph or when major topographical constraints are present, a paved shoulder width of 4 feet may be used.

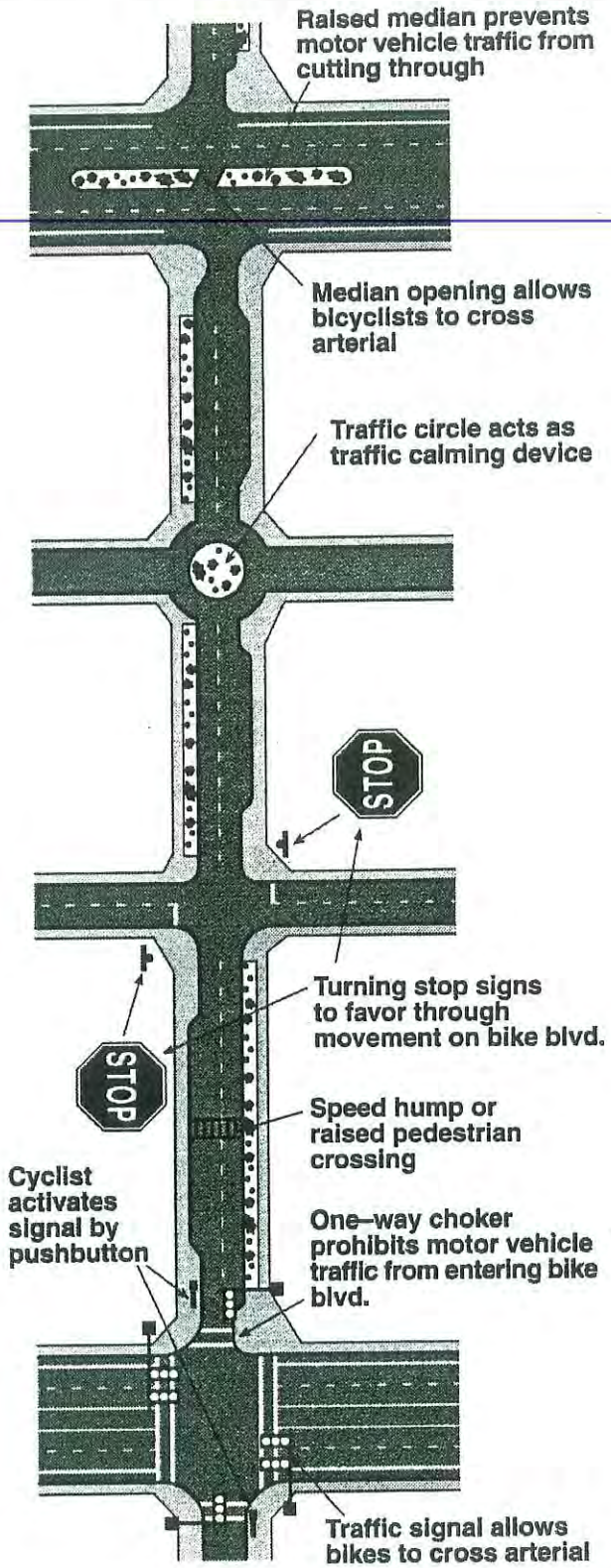


EXHIBIT 7
TRAFFIC CALMING ELEMENTS

© 1999 CURTIS LUECK & ASSOCIATES TUCSON. AZ

Traffic calming elements, such as speed humps (above) and traffic circles (below) can help improve safety for pedestrians, cyclists, and drivers

Multiuse lanes are located on curbed arterial and collector roadways and range from 4 feet in usable width to 8 feet. Usable width is defined as the distance between the edge of gutter pan to the painted white edge stripe. The standard multiuse lane ranges from 6 feet to 8 feet usable width on arterial roadways, and 4 feet to 6 feet on

collectors. On roadways which are curbed but do not have gutter pans, multiuse lanes range from 5 feet to 10 feet in width from face of curb to edge stripe.

Paved shoulders such as these on Tangerine Road east of 1st Avenue provide multiple safety benefits to roadway users

Paved shoulders and multiuse lanes are beneficial to bicyclists, and in some conditions (such as when a sidewalk is not available) to pedestrians and people in wheelchairs. On some roadways paved shoulders and multiuse lanes may be used by golf carts, where allowed by the Town Engineer. Paved shoulders and multiuse lanes may also be used temporarily by utility companies making repairs or installations, and on an emergency basis by motor vehicles which have broken down. In fact, paved shoulders have been found to have an overall benefit-to-cost ratio of nearly 5 to 1 due to increased safety, reduced tort liability, and reduced maintenance costs *(Texas Transportation Institute, 1989).*

High standard paved shoulders or multiuse lanes are provided as part of the cross section of new or widened arterial and collector roadways. In order to implement paved shoulders on existing roadways, travel lane and median widths may be reduced within acceptable AASHTO guidelines as part of restriping or repaving and rehabilitation projects. Typical cross sections for roadways with paved shoulders and with multiuse lanes are shown in Exhibit 8.

On existing roadways where implementation of paved shoulders or multiuse lanes is not feasible or they will not be constructed for several years in the future, "Share the Road" or "Watch for Bikes" signs as shown in Exhibit 9 should be used.

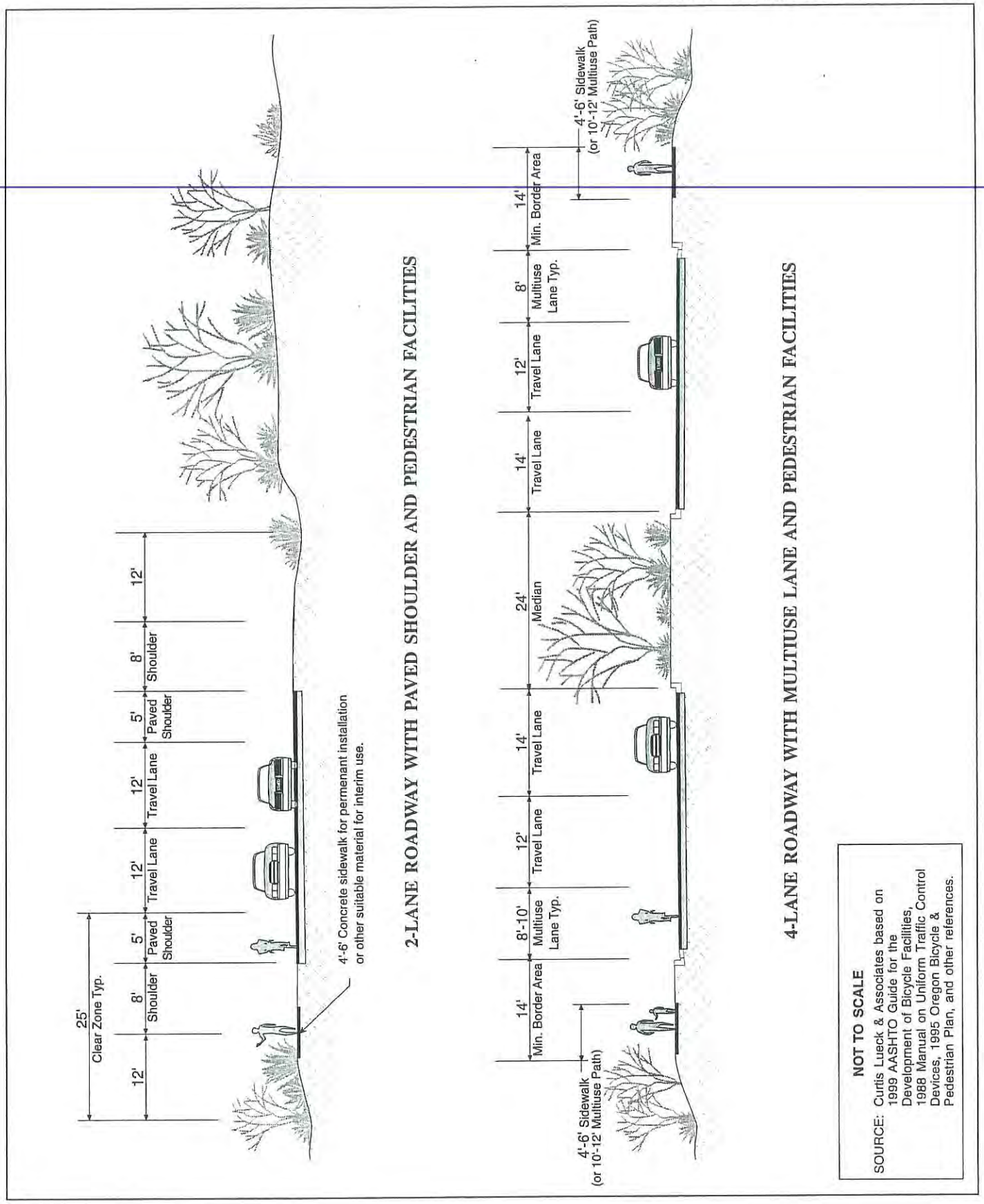
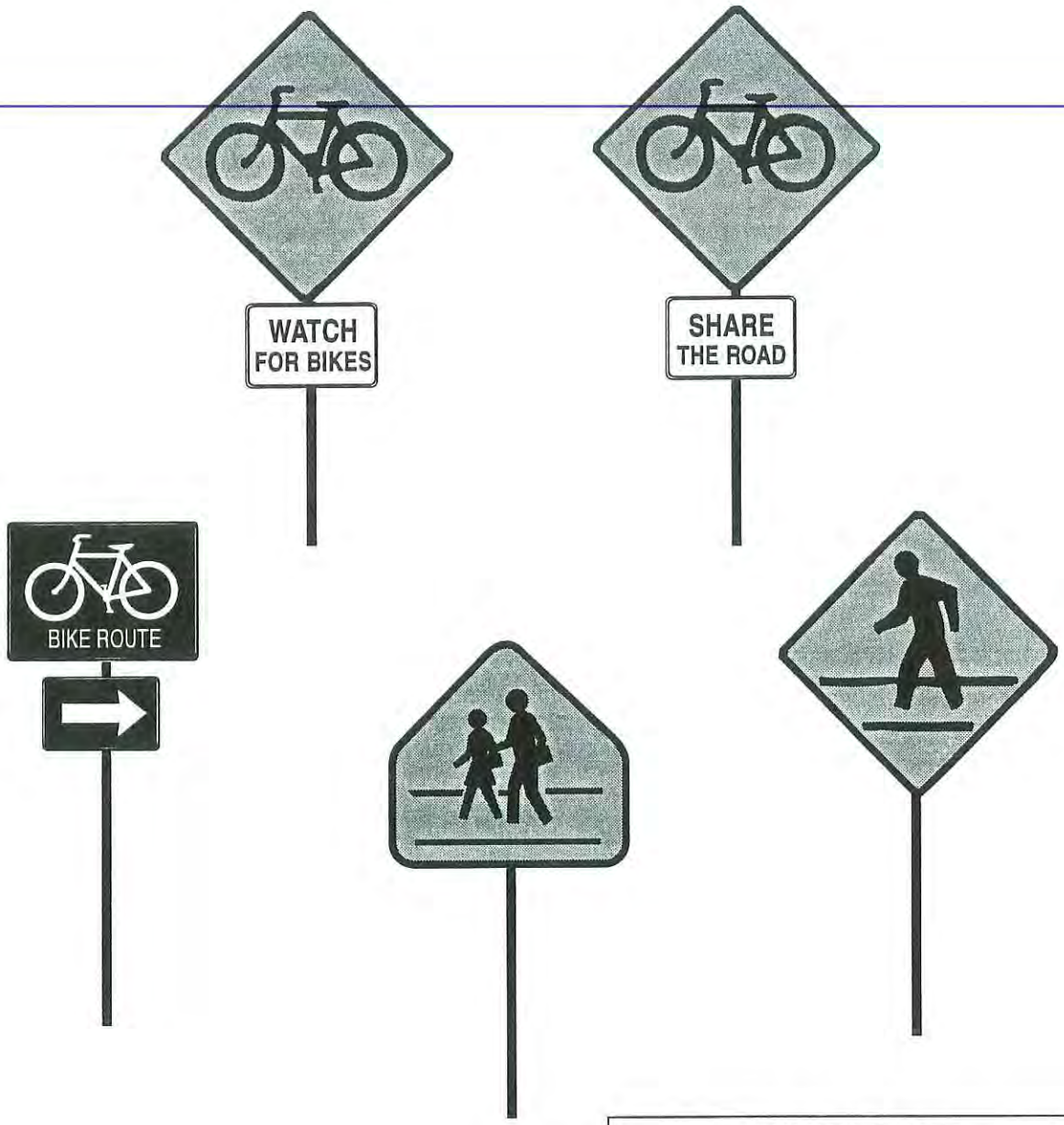


EXHIBIT 8
TYPICAL ROADWAY CROSS SECTIONS

© 1999 CURTIS LUECK & ASSOCIATES TUCSON. AZ



NOT TO SCALE

SOURCE: Curtis Lueck & Associates based on 1999 AASHTO Guide for the Development of Bicycle Facilities, 1988 Manual on Uniform Traffic Control Devices, 1995 Oregon Bicycle & Pedestrian Plan, and other references.

EXHIBIT 9
RECOMMENDED SIGNS

© 1999 CURTIS LUECK & ASSOCIATES TUCSON. AZ

Additional Design and Locational Considerations

Shared-use and Sidewalk Path Facilities

Shared-use paths and sidewalk paths located immediately adjacent to the roadway are discouraged by AASHTO. This is due to several factors including the potential for high numbers of intersecting roadways, opposite direction travel by bicyclists and resulting conflicts at intersections, potential insufficient sight distances due to walls and other obstructions, and possible conflicts within the right-of-way such as utility poles.

The AASHTO *Guide for the Development of Bicycle Facilities* and other acceptable State or local guidelines should be consulted before designing and designating shared-use paths immediately next to roadways or sidewalk paths. Properly designed, the sidewalk path may be designated as a legal path for short distances to serve as an important linkage within the pedestrian and bikeway network. Two-way bicycle traffic as well as pedestrian traffic should be expected on shared-use paths or sidewalk paths under these conditions. Therefore, these paths should be 10 to 12 feet wide to accommodate both pedestrian and bicycle traffic.

Driveways and cross-streets should be limited to 3 or less per quarter-mile (12 per mile) before sidewalk paths are implemented. This is critical to improve safety for users, who range from inexperienced to proficient bicyclists, rollerbladers, and others. In addition, where the distance between a shared-use or sidewalk path and the roadway is less than 5 feet, a suitable physical divider with a top rail height of 4 1/2 feet is recommended. Additional signing, striping and other measures should be used to alert drivers and pathway users to be watchful at intersections.

Shared-use paths and sidewalk bicycle facilities should not be considered a substitute for on-road bicycle facilities. Paved shoulders, multiuse lanes, or wide curb lanes (i.e., 14 feet or greater) should be implemented along roadways that have adjacent paths or sidewalk bicycle facilities. As stated within AASHTO, many bicyclists will use the roadway instead of the shared-use path or sidewalk because they have found the roadway to be safer, more convenient, or better maintained.

Grade Acceptability

Guidance for grade acceptability for bicycle routes or shared-use facilities is judged in terms of the slope and length of the grade. The acceptability and design comments for shared-use paths and bicycle routes are provided in Exhibit 10.

On shared-use paths, grades which meet Americans with Disabilities Act (ADA) provisions are important to accommodate users with disabilities. ADA requires that the grade of shared-use paths not exceed 5 percent. A maximum grade of 8.3 percent is acceptable for a rise of no more than 2 1/2 feet (30 feet horizontal distance) if a level landing at least 5 feet in length is provided at each end. This is suitable on shared-use paths only in limited locations, as an 8.3 percent slope followed by level landings creates a choppy effect that is difficult to construct and less desirable to some users.

Grade acceptability for paved shoulders and multiuse lanes are not presented in this table. Arterial and collector roadways which have paved shoulders or multiuse lanes often have sections with grades greater than 5 percent. This is considered acceptable, as these facilities are generally for commuters and recreational riders who have more ability and proficiency to negotiate grades steeper than 5 percent.

EXHIBIT 10
GRADE ACCEPTABILITY FOR PEDESTRIAN AND BICYCLE FACILITIES

Pedestrian or Bikeway Type	Grade	Distance	Acceptability	Design Comments
Paved Shared-use Path	5% or less	Any	Desirable	20 to 25 mph design speed, 10 foot width or wider, good horizontal alignment and sight distance.
Paved Shared-use Path	5.1% to 8.3% max	30 feet with 5 foot horizontal landings	Acceptable for short distances/ selected locations	25 to 35 mph design speed, 12 foot width, good horizontal alignment and sight distance. Flat landings necessary to accommodate wheelchair users.
Bike Route on Local Street	>6%	<500 feet	Acceptable	Provide good sight distance and advance warning of hazards/traffic control. Consider traffic calming measures for roadway.
Bike Route on Local Street	>6%	>500 feet	Less Desirable*	Consider alternate location for bike route or provide good sight distance and advance warning of hazards and traffic controls. Consider traffic calming measures for roadway.

*Bike routes over six percent for more than 500 feet are less desirable because the ascents are difficult for many bicyclists to climb and the descents cause some bicyclists to exceed the speeds at which they are competent.

Right Turn Considerations

Single Right Turn Lanes

Where right turn lanes are warranted on streets with an edge stripe, additional striping should be provided at intersection approaches. Minimum curb radii should also be utilized to help reduce motor vehicle speeds and reduce pedestrian crossing distances. A recommended intersection treatment to improve safety for pedestrians and bicyclists is depicted in Exhibit 11.

Single Right Turn Lane and Through/Right Turn Lane

At some intersections the traffic demand for right turns is high enough to warrant provision of a right turn lane and through-right turn lane. This configuration presents difficulties for bicyclists who wish to travel straight through an intersection and is unsure if the vehicle passing him on the left will be making a right turn. It also presents difficulties for pedestrians who now face two lanes of traffic turning across the crosswalk. A sample treatment for improving safety for pedestrians and bicyclists is provided in Exhibit 12.

Dual Right Turn Lanes

An unchannelized intersection presents relatively minor problems for cyclists; a double right turn lane presents unacceptable hazards. Warrants for dual right turn lanes should be used to ensure that they are provided only if necessary. Extra provisions to improve safety for pedestrians and bicyclists should be provided.

Free Right Turn Lanes

Free right turn lanes which allow drivers to turn right without stopping and sometimes at relatively high rates of speed should only be used where warranted by a traffic study, as they present the following problems for bicyclists and pedestrians:

- Right turning vehicles and through bicyclists must cross travel paths, where motorists may not understand they must yield the right of way to bicyclists;
- The additional lane width adds to the pedestrian crossing distance; and
- Right-turn moves, made easier by the right-turn lane, may result in inattentive drivers not seeing bicyclists or pedestrians at the intersection.

If free right turn lanes are necessary, signalization, signing, and geometric modifications to help slow motor vehicle speeds on approaches should be considered.

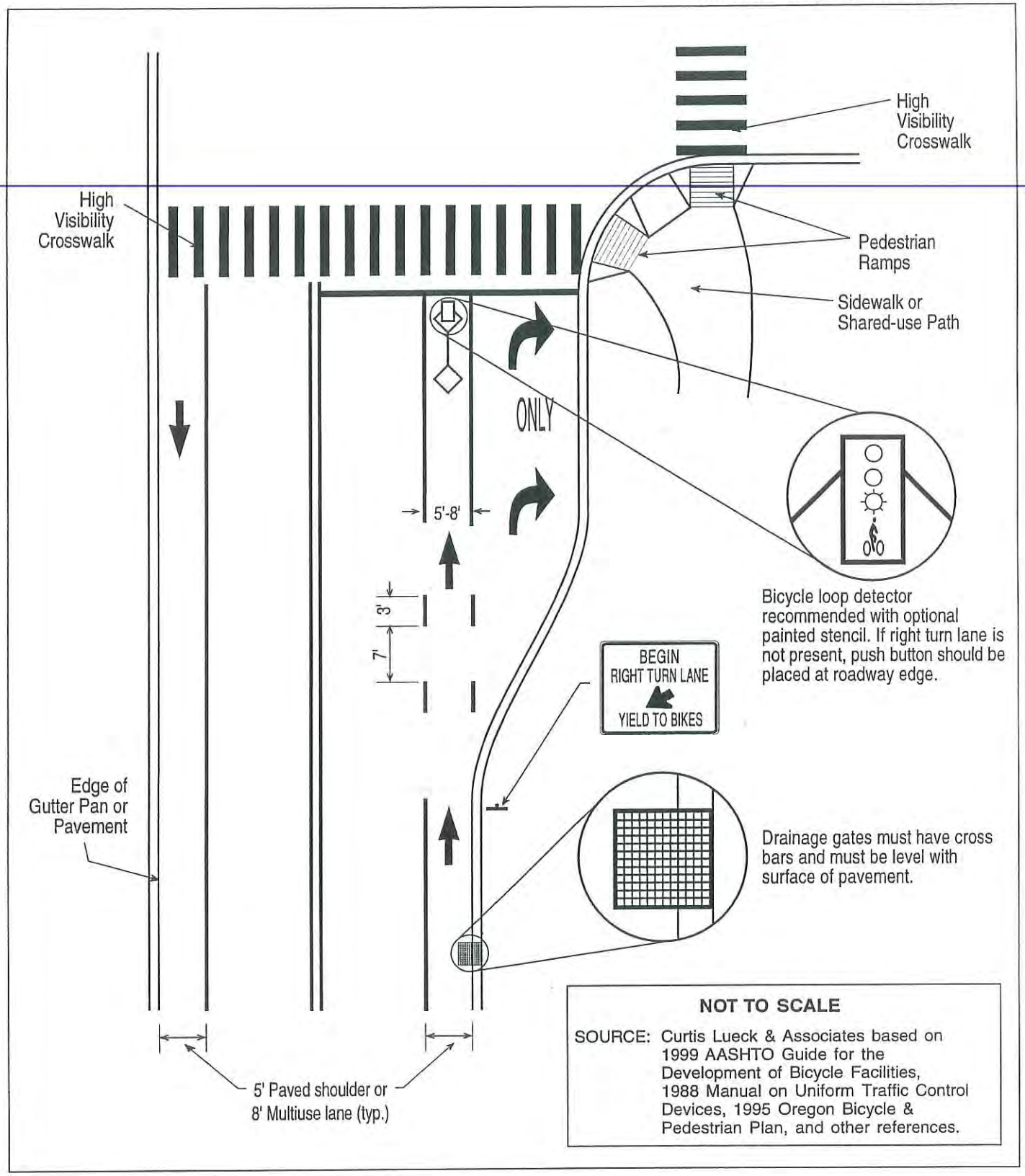
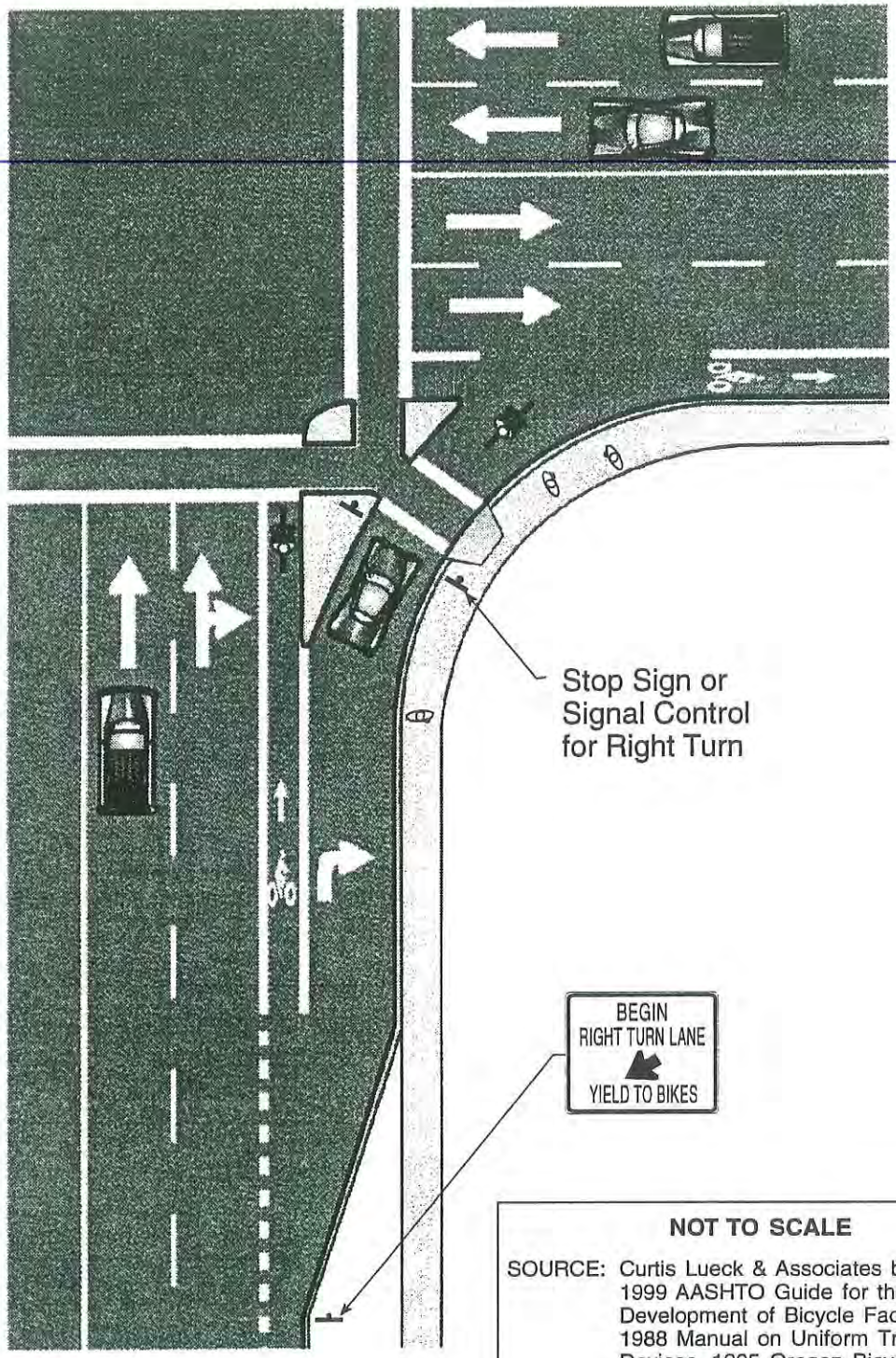


EXHIBIT 11
RECOMMENDED INTERSECTION TREATMENT FOR PAVED SHOULDER AND MULTIUSE LANE

© 1999 CURTIS LUECK & ASSOCIATES TUCSON. AZ



NOT TO SCALE

SOURCE: Curtis Lueck & Associates based on 1999 AASHTO Guide for the Development of Bicycle Facilities, 1988 Manual on Uniform Traffic Control Devices, 1995 Oregon Bicycle & Pedestrian Plan, and other references.

EXHIBIT 12
RECOMMENDED INTERSECTION TREATMENT FOR DUAL RIGHT-TURN LANES (ONLY WHERE DUAL RIGHT-TURN LANES ARE WARRANTED)

© 1999 CURTIS LUECK & ASSOCIATES TUCSON, AZ

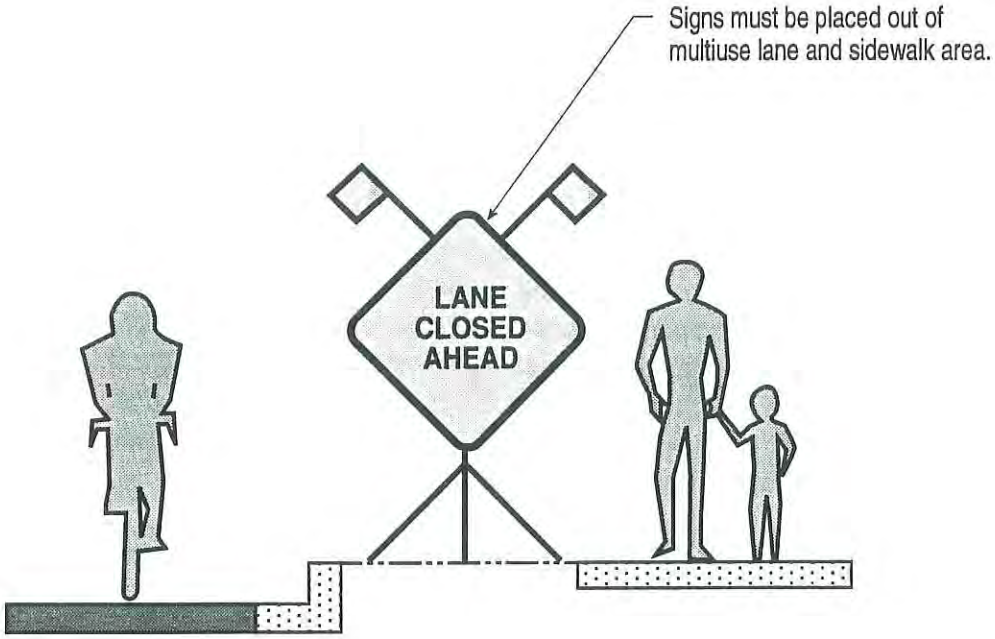
Maintenance Considerations

A strong maintenance program is necessary to ensure continued and safe use of pedestrian and bicycle facilities. Foremost, a consistent sweeping program to remove debris from roadways, paved shoulders/multiuse lanes, and shared-use paths is highly desirable. Responsive attention by the Town to pedestrian and bikeway maintenance requests by Town residents and visitors is also highly desirable to quickly address problems and to maintain a strong rapport with citizens.

Pavement should be maintained to a safe standard on all on-street bikeways. Dense graded asphalt concrete surfaces are preferable to open graded or seal-coated surfaces. All manhole covers, utility covers, drop inlet and other drainage grates, and construction joints should be located outside of paved shoulders or multiuse lanes, if possible. If covers or drainage grates are located within the paved shoulders/multiuse lanes, they must be kept level with the surrounding pavement

If utility work is necessary within the paved shoulder/multiuse lane, the full width of the area should be repaved to grade after work is complete. Safe detour provisions for bicyclists should be made when bicycle facilities are temporarily closed for utility work. Appropriate location of signage and provision of wide curb lane facilities in construction areas are shown in Exhibits 13 and 14, respectively. Construction and barricade workers should be trained and monitored to ensure safe pedestrian and bicycle passage through construction zones.

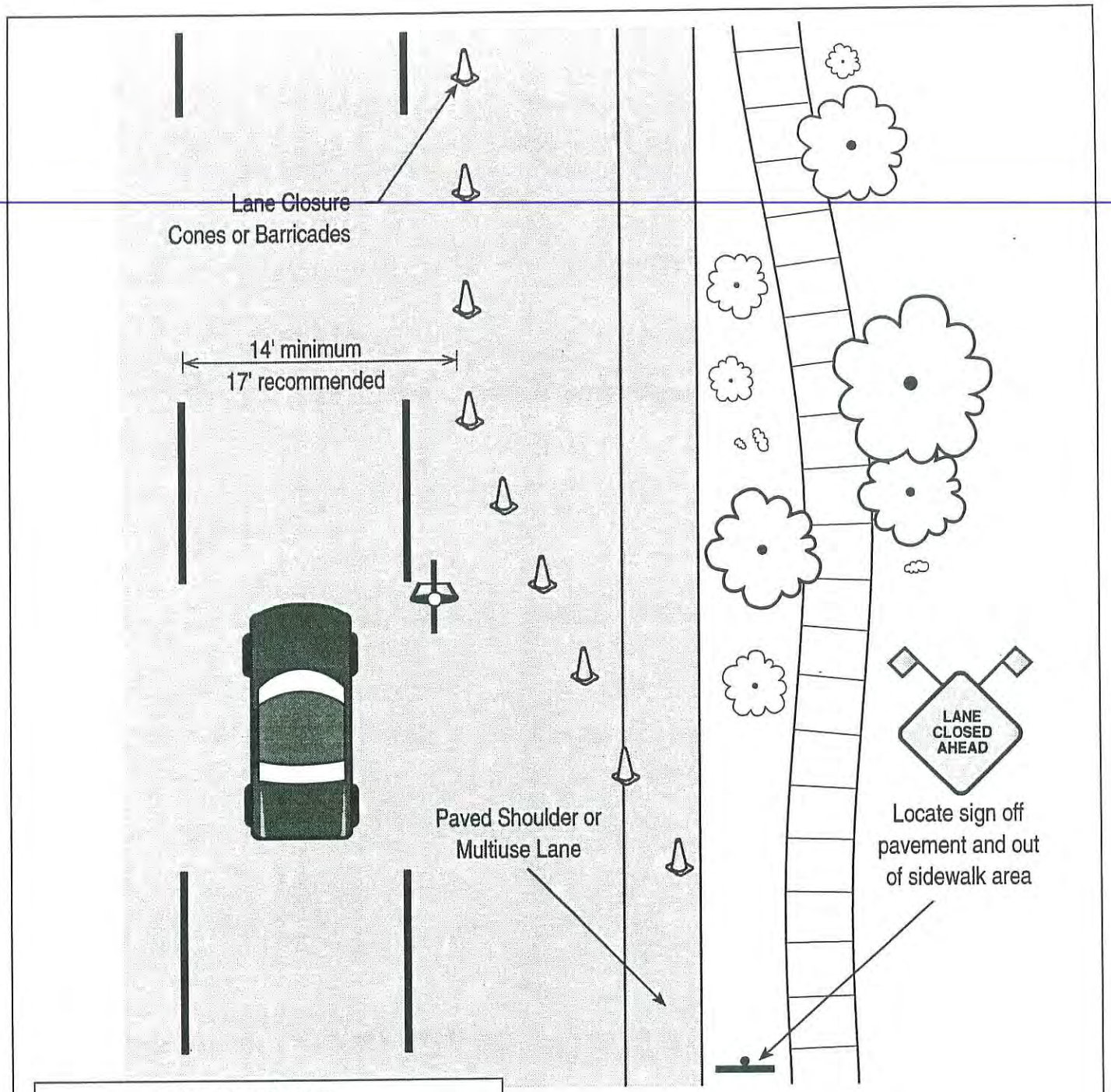
Pavement edges, including where the asphaltic concrete roadway meets the Portland cement concrete gutter pan, should be flush to reduce the potential for bicycle accidents. Elimination of the gutter pan should be considered if drainage conditions permit on new or reconstructed roadways in order to provide greater curb lane space for bicycling.



NOT TO SCALE

SOURCE: Curtis Lueck & Associates based on 1999 AASHTO Guide for the Development of Bicycle Facilities, 1988 Manual on Uniform Traffic Control Devices, 1995 Oregon Bicycle & Pedestrian Plan, and other references.

EXHIBIT 13
CONSTRUCTION SIGN LOCATION OFF PAVEMENT



NOT TO SCALE

SOURCE: Curtis Lueck & Associates based on 1999 AASHTO Guide for the Development of Bicycle Facilities, 1988 Manual on Uniform Traffic Control Devices, 1995 Oregon Bicycle & Pedestrian Plan, and other references.

EXHIBIT 14
WIDE CURB LANE THROUGH CONSTRUCTION AREA

© 1999 CURTIS LUECK & ASSOCIATES TUCSON. AZ

6. Implementation

Introduction

Implementation of the *Oro Valley Pedestrian and Bicycle Plan* will require strong commitment of Town staff and funding resources. The plan is phased over a 10-year period, with construction of projects beginning in Fiscal Year 1999-2000. It is anticipated that over this time period pedestrian and bicycle facilities, policies, and programs will become a normal part of Town operations as well as integrated into private sector development practices.

The ambitious 10-year schedule will entail development of pedestrian and bicycle projects "piggybacked" onto roadway improvement projects, construction of independent projects by the Town and by the private sector, and implementation of some projects by Pima County (e.g., the shared-use path along the Cañada del Oro Wash).

It is likely that the priority of implementation for some of the elements may shift over the next 10 years, resulting in adjustments to the plan. However, with an aggressive funding program, continued growth in Town revenues, strong public demand for pedestrian and bicycle provisions, and sharing of project costs with roadway improvement projects the *Oro Valley Pedestrian and Bicycle Plan* can become a reality by the year 2010.

The following section presents planning-level cost estimates for pedestrian and bicycle facilities and programs, and a funding framework for implementing these elements. Also presented in this chapter are proposed strategies and departmental responsibilities in carrying out the plan, based upon the Goals and Objectives presented in Chapter 2. These strategies provide a blueprint for the effective development of major projects and programs over the next five years, and is intended to be updated within a three to five year time period to carry through to year 2010.

Cost Estimates

Planning-level cost estimates have been developed for pedestrian and bicycle facilities and programs, based upon Oro Valley and other Arizona jurisdiction costs for similar projects. Also included are maintenance estimates, including routine maintenance as well as reconstruction of facilities. Maintenance costs are critical to account for in the provision of pedestrian and bicycle facilities due to the high public demand for well-maintained facilities and to the increased Town liability for facilities which are not adequately maintained. The facility andprogram cost estimates are presented within Exhibits 15 and 16 on the following pages

Exhibit 15
Planning-Level Cost Estimates
Year 2000-2010 Pedestrian and Bikeway Facilities
(In Year 2000 Dollars)

Category	Avg. Cost per Centerline Mile	Total Miles or Units	Total Construct. Cost	Avg. Annual Maint. Cost/Mile	Total Cost 2000-2010	Assumptions (all costs include mobilization)
Sidewalk (5' width on both sides of roadway, added during roadway construction/reconstruction)	N/A	8.3	N/A	$500	$20,600	Assumes limited right-of-way needed, provision of landscaping, rest stops, and other amenities.
Sidewalk (5' width on both sides of roadway)	$100,000	5.4	$540,000	$500	$553,500	Assumes limited right-of-way needed, provision of landscaping, rest stops, and other amenities.
Paved multiuse path (10'-12' width, Town sections)	$350,000	2.9	$1,015,000	$500	$1,022,300	Assumes limited right-of-way needed, bridges, landscaping, rest stops, and other amenities.
Paved multiuse path (10'-12' width, Pima County CDO)	N/A	2.5	N/A	Maint. by PC	-	Built by Pima County
Paved multiuse path (10'-12' width, by Rancho Vistoso)	N/A	0.2	N/A	Maint. by RV	-	Woodshade path, built by Rancho Vistoso
Paved multiuse path (10'-12' width, Lambert Lane)	N/A	2.2	N/A	$500	$11,000	Incl. in FY 1999 budget, 10 year maintenance
On-street bike routes (signed only)	$800	29.9	$23,920	$100	$38,900	Assumes 4 signs average each direction per mile @ $100 per sign installed
On-street multiuse lanes (Existing roadway restriped to have 6'-8' multiuse lane)	N/A	2.5	N/A	Incl. as part of roadway maint.	-	Woodburn, Del Webb Blvd. Included as part of roadway repaving. Assumes edge striping, signs
On-street paved shoulders (5' paved shoulder added to existing roadway, with signs)	$100,000	9.7	$970,000	Incl. as part of roadway maint.	$970,000	Assumes additional pavement, edge striping, signs, subgrade preparation (does not include FY 99 Tangerine improvements)
On-street multiuse lanes (6'-8' multiuse lane added as part of roadway construction or reconstruction, signs)	N/A	7.8	N/A	Incl. as part of roadway maint.	-	Included as part of roadway improvement costs. Assumes additional pavement, edge striping, curb and gutter, signs, subgrade preparation
Enhanced street crossings (include signing, striping, some raised medians, some signal improvements)	$5,000	14	$70,000	$500	$105,000	Enhanced crossings will vary, some will be located at signalized intersections, some mid-block with or without raised median refuge and traffic signals
Spot pedestrian and bicycle safety improvements	$50,000	10	$500,000	$500	$525,000	Budget $50,000 per year average to provide spot sidewalk and bicycle safety improvements
Total			**$3,118,900**		**$3,246,300**	

N/A = Not Applicable
Note: Maintenance, unless otherwise indicated, assumes average maintenance period of five years due to project phasing.

Exhibit 16
Planning-Level Cost Estimates
Year 2000-2010 Pedestrian and Bikeway Programs
(In Year 2000 Dollars)

Category	Avg. Annual Cost	Total Cost 2000-2010	Notes
Pedestrian/Bicycle Coordinator (half-time), incl. benefits, staff support	$25,000	$25,000	Assumes one year at half-time
Pedestrian/Bicycle Coordinator full-time), incl. benefits, staff support	$50,000	$450,000	Assumes nine years at full-time
Coordination, planning, and printing costs for Travel Reduction, Bike/Ped Week programs, miscellaneous	$5,000	$50,000	
Total Program Cost	**$80,000**	**$525,000**	
Total Project Construction and Maintenance Cost		**$3,246,300**	
Total Program and Project Cost, 2000-2010		**$3,771,300**	

© 1999 CURTIS LUECK & ASSOCIATES TUCSON, AZ

The total cost to implement the *Oro Valley Pedestrian and Bicycle Plan* is approximately $3.8 million by year 2010, or an average of $377,000 per year over the plan period. Of this cost, $3.3 million is estimated for facility improvements and maintenance, and $0.5 million is for support programs.

As can be seen within Exhibit 16, this total estimate assumes that new and reconstructed roadways will include pedestrian and bicycle facilities built as part of the standard roadway cross section. The estimate also assumes costs for most "traffic calming" elements will be covered by existing and future residents and businesses. These elements are typically neighborhood-driven and paid for either through special tax levies or donations within neighborhoods, or are provided by developers.

Funding Opportunities

The Town has a variety of funding sources directly available for construction of pedestrian and bicycle facilities and for implementation of support programs. The Town also has good potential to secure Federal grants, which have increased dramatically in size and number since the early 1990's.

For Fiscal Year 1999-2000, the Town has dedicated a total of $1.3 million in funding for the construction of paved shoulders, drainage, and safety improvements on 1st Avenue from Lambert Lane to Tangerine Road and on Lambert Lane from 1st Avenue to La Cañada Drive. The Town has also dedicated a total of $400,000 over FY 1998-99 and FY 1999-2000 for the construction of the Lambert Lane off-street shared-use path.

This high funding level demonstrates the Town's belief in the importance of these facilities and commitment to their development. Local, State, and Federal revenues available for pedestrian and bicycle provisions include:

- *Local revenues:* The primary local revenues available for use on pedestrian and bicycle improvements are Development Impact Fees. These fees are paid by developers to help cover the additional transportation costs resulting from new residential construction. These funds may be used on provision of multiuse lanes, paved shoulders, and in some locations, for shared-use paths.

  Total local revenues dedicated to transportation purposes within the Town are $937,000 from FY 1999-2000 through FY 2003-04.

- *State revenues:* State revenues include the State-shared sales tax, ADOT discretionary funds, and Highway User Revenue Funds (HURF). Although available for pedestrian/bicycle facilities and programs, sales tax revenues go into the Town's General Fund, which is generally dedicated to other high priority programs and needs within the Town. ADOT 12.6% and 2.6% funds, formerly restricted to controlled-access facilities within Pima County, can be used for the provision of paved shoulders/multiuse lanes on Town roadways. The HURF, made up of State

gas tax revenues, the vehicle license tax, and other miscellaneous fees and services, is a revenue source constitutionally restricted to roadway purposes. Arizona jurisdictions have utilized HURF to construct paved shoulders, multiuse lanes, and sidewalk facilities which are within the roadway right-of-way. In limited instances, such as with the Aviation-Golf Links Highway in Tucson, HURF has also been used to construct shared-use paths located within the right-of-way.

Total ADOT and HURF revenues programmed for the Town are $3.0 million for FY 1999-2000 through FY 2003-04.

- *Federal revenues:* On June 9, 1998, the President signed into law the Transportation Equity Act for the 21st Century (TEA-21), authorizing highway, safety, transit and other surface transportation programs for the next six years. TEA-21 revenues available to the Town for pedestrian and bicycle uses are primarily received through the Surface Transportation Program (STP), which includes setaside funding categories specifically available for pedestrian/bicycle facilities and programs such as the Transportation Enhancements program.

  The STP provides flexible funding categories and ensures the consideration of bicyclists and pedestrians in the planning process and facility design. STP funds can be used for provision of sidewalks and modification of sidewalks to meet Americans with Disabilities Act (ADA) requirements, for shared-use paths, paved shoulders and multiuse lanes, and for pedestrian and bicycle safety and educational programs.

  Ten percent of STP funding is set aside for Transportation Enhancements, which can be spent on environmentally related improvements including pedestrian and bicycle provisions. TE funds can be used for both paved as well as unpaved pathways which primarily serve a transportation purpose.

  Total STP revenues programmed for the Town are $11.6 million for Fiscal Years 1999 through 2003. These revenues do not include the 10 percent Transportation Enhancement setaside, which is administered by ADOT in a competitive statewide reimbursement program. Approximately $11.1 million per year in Transportation Enhancement funds is anticipated to be available statewide over the next six years.

For Fiscal Years 1999-00 through 2002-03, the Town has programmed $200,000 per year for the provision of shared-use path and lane facilities as part of the Town's Capital Improvements Program. In order to meet the Town's total anticipated cost to implement the *Oro Valley Pedestrian and Bicycle Plan,* dedication of additional revenues to pedestrian and bicycle improvements as well as more aggressive pursuit of transportation grants is needed.

As one of the fastest growing communities in Arizona, it is anticipated that an average 8 percent annual growth in funds dedicated to pedestrian and bicycle improvements from the base level funding in year 2000 is feasible. The Town grew from 20,000 in population in 1990 to over 26,000 in 1995, a 23 percent change. It is likely that when the Year 2000 Census is completed, the Town will show an estimated 20 to 30 percent increase in population from 1995, and State-shared revenues in the form of the sales tax and HURF funds should increase proportionately.

Also, with the strong public demand for pedestrian and bicycle facilities demonstrated through surveys and open houses, the Town can designate a higher proportion of local, State, and Federal funds for pedestrian and bicycle uses than what is currently designated. It is assumed for forecasting purposes that the Town will designate an additional 5 percent per year for pedestrian and bicycle facilities from the current funding stream.

Exhibit 17 presents a scenario comparing potential funding versus project and program costs to implement the *Oro Valley Pedestrian and Bicycle Plan*. The scenario assumes the additional dedication of revenues discussed above and reception of two Federal Transportation Enhancement grants over the 10-year plan period. Project costs, although presented at a constant growth rate in the table, will likely range considerably on a year-to-year basis over the plan period depending upon the size and cost of specific projects.

As can be seen within the scenario, strong commitment by the Town to pedestrian and bicycle improvements will be necessary to complete the plan by the year 2010. This commitment will be required not only in terms of funding but also in terms of consistent involvement by Town departments. The following section describes the implementation strategies and responsibilities proposed for the primary Town departments responsible for implementing the plan.

Implementation Strategies and Responsibilities

The *Oro Valley Pedestrian and Bicycle Plan* requires a strong level of commitment to see it to its fruition by the year 2010. Unlike many plans, which end up on bookshelves, this plan includes an implementation strategy that demonstrates the Town's commitment by designating appropriate departments to take the lead on carrying out the plan elements. This strategy will result in a "living" plan that is referred to and monitored frequently by Town engineers and planners as they proceed to make the community more pedestrian and bicycle friendly.

Exhibit 17
Potential Funding vs Cost Scenario
(Year 2000 Dollars)

Fiscal Year	Funds	Notes	Cost	Net Difference	Cumulative
2000	$ 200,000	1	$ 200,000	$ -	$ -
2001	$ 226,000	2	$ 226,000	$ -	$ -
2002	$ 305,000	2, 3	$ 256,000	$ 49,000	$ 49,000
2003	$ 288,000	2	$ 290,000	$ (2,000)	$ 47,000
2004	$ 325,000	2	$ 328,000	$ (3,000)	$ 44,000
2005	$ 367,000	2	$ 374,000	$ (7,000)	$ 37,000
2006	$ 415,000	2	$ 427,000	$ (12,000)	$ 25,000
2007	$ 519,000	2, 3	$ 487,000	$ 32,000	$ 57,000
2008	$ 530,000	2	$ 553,000	$ (23,000)	$ 34,000
2009	$ 599,000	2	$ 629,000	$ (30,000)	$ 4,000
Total by beginning of Year 2010:	**$ 3,774,000**		**$ 3,770,000**	**$ 4,000**	**$ 4,000**

Notes:

1. Base level funding in Town Capital Improvements Program.
2. Assumes 8 percent annual overall growth in Town revenues plus 5 percent additional dedication of local, State and Federal revenues to ped/bike provisions.
3. Assumes successful receipt of Transportation Enhancement grants (two grants

This strategy, presented over the following pages in Exhibit 18, also includes a timeline for each of the elements divided into the periods 2000-2001, 2001-2003, and 2003-2005. The timeline goes only to the year 2005 due to the need to update the plan by that time period, at which point many of the strategies and their priority may change. Completion of some elements, including the development of pedestrian and bicycle facility design guidelines for the Town, will occur only once and within one specified time frame. Other elements, such as conducting training sessions for Town staff on pedestrian and bicycle issues, are proposed to occur in each of the three time periods.

EXHIBIT 18 IMPLEMENTATION STRATEGIES

The Vision of the Town of Oro Valley Pedestrian and Bicycle Plan is to:

"Develop and promote the Town of Oro Valley as an Outstanding Pedestrian and Bicycle-Friendly Community in Arizona."

Goal 1: Establish policies which promote walking and bicycling as healthy forms of transportation and recreation.					
Objectives	***Actions***	***Time Frame***			***Recommended Offices of Primary/Secondary Responsibility***
		2000-01	***2001-03***	***2003-05***	
A. Provide a staff position dedicated to pedestrian and bicycle planning.	*1. Research appropriate Town department for part-time or full-time positions.*	X			*Public Works*
B. Provide staff training for pedestrian and bicycle transportation planning and design.	*1. Coordinate biannual training sessions for Community Development, Public Works and Oro Valley Police Department.*	X	X	X	*Public Works/Planning and Zoning*
	2. Participate in and support statewide pedestrian and bicycle training conferences.	X	X	X	*Public Works/Planning and Zoning*

Goal 1 (continued): Establish policies which promote walking and bicycling as healthy forms of transportation and recreation.

Objectives	Actions	Time Frame 2000-01	2001-03	2003-05	Recommended Offices of Primary/Secondary Responsibility
C. Establish a Citizens Pedestrian and Bicycle Advisory Committee	1. Research and model this new committee after existing pedestrian and bicycle advisory committees.	X			Planning and Zoning/Public Works
	2. Mayor and council to adopt an ordinance establishing the committee and its responsibilities.	X			Planning and Zoning/Public Works
	3. Mayor and Council to appoint the advisory committee members.	X			Planning and Zoning
D. Provide incentives to businesses, schools, and agencies to promote walking and bicycling (e.g., racks, lockers, showers).	1. Research successful incentive programs.		X		Planning and Zoning
	2. Develop and implement locally appropriate incentives.		X		Planning and Zoning
E. Establish a dedicated local funding source for construction and maintenance of pedestrian and bicycle facilities.	1. Allocate funds and/or require developer contributions for construction of pedestrian and bike facilities	X	X	X	Planning and Zoning/Public Works
	2. Allocate dedicated funding amounts directly to pedestrian and bike facility maintenance.		X	X	Public Works
F. Actively pursue Federal Transportation Enhancement and other Federal and State grant funding	1. Dedicate a part-time or full-time staff position to grant writing.	X	X	X	Public Works
	2. Provide matching local funds for State and Federal grant funds.	X	X	X	Public Works

Goal 2: Develop and maintain continuous and interconnected pedestrian and bikeway systems.					
Objective	**Actions**	**Time Frame**			**Recommended Offices of Primary/Secondary Responsibility**
		2000-01	**2001-03**	**2003-05**	
A. Identify and secure right-of-way along roadways, major and minor watercourses, nature trails, and utility easements.	1. Coordinate activities among departments to secure ROW.		X	X	Public Works
	2. Actively work with land-owners and Homeowners Associations to demonstrate benefits of pedestrian/bike facilities as part of ROW acquisition.		X	X	Public Works/Parks and Recreation
	3. Develop a sub-plan for the Western Area Power Authority easement		X		Planning and Zoning/Parks and Recreation
B. Prioritize pedestrian and bicycle improvements for a three-mile radius ("hub and spoke" pattern) around employment locations, schools, and activity centers.	1. Identify and work directly with representatives of "hub" locations to identify appropriate routes and support facilities (e.g., racks, lockers, etc.)	X	X	X	Planning and Zoning/Parks and Recreation
	2. Prioritize implementation of new "spokes" and eliminating gaps in existing "spokes" when allocating funding.		X	X	Public Works
C. Eliminate gaps and barriers in the pedestrian and bikeway systems when constructing roadway, pedestrian, and bikeway improvements.	1. Ensure in construction of spot roadway improvements as well as major roadway improvements that pedestrian and bicycle accommodations are provided.	X	X	X	Public Works
	2. Prioritize the elimination of gaps in existing pedestrian and bikeway facilities.	X			Public Works

Goal 2 (continued): Develop and maintain continuous and interconnected pedestrian and bikeway systems.					
Objective	**Actions**	**Time Frame**			**Recommended Offices of Primary/Secondary Responsibility**
		2000-01	**2001-03**	**2003-05**	
D. Construct special pedestrian and bicycle crossings of high volume streets.	1. Evaluate the need for refuge islands and enhanced crossings through field inventory and surveys of pedestrians and bicyclists.		X		Public Works
	2. Provide high-standard crossing treatments based on existing recommended design standards.		X	X	Public Works
	3. Provide enhanced crossings at signalized intersections and at unsignalized intersections and mid-block locations, as appropriate.		X	X	Public Works
E. Monitor the Plan and update it at 3 to 5 year intervals.	1. Ensure implementation of Plan elements, particularly phased construction of pedestrian and bicycle facilities.	X	X	X	Public Works/Planning and Zoning
	2. Conduct bimonthly meetings to evaluate implementation of the Plan, provide adjustments, and make notation of recommendations for future Plan updates.	X	X	X	Public Works/Planning and Zoning
	3. Perform a comprehensive update of the Plan at 3 to 5 year intervals.			X	Public Works/Planning and Zoning/Parks and Recreation

Goal 3: Use pedestrian and bicycle-friendly standards, procedures and ordinances for pedestrian/bicycle facilities and roadways, following Crime Prevention Through Environmental Design (CPTED) principles where applicable.

Objective	Action	Time Frame 2000-01	2001-03	2003-05	Recommended Offices of Primary/Secondary Responsibility
A. Incorporate pedestrian and bicycle friendly standards in major roadway improvements.	1. Provide 6-foot to 8-foot multi-use lanes and 5-foot to 6-foot sidewalks on both sides of the roadway on all new or reconstructed collector and arterial roadways and bridges.	X	X	X	Public Works
	2. Provide multi-use lanes with all new turn lanes added to collector and arterial roadways by the Town and developers.	X	X	X	Public Works
	3. Provide multi-use lanes at all intersection approaches up to crosswalks.	X	X	X	Public Works
	4. Provide loop detectors, video detectors, and/or accessible push-button actuators to make traffic signals responsive to pedestrians and bicyclists.	X	X	X	Public Works
	5. Incorporate audible crossing signals to assist the visually impaired at intersections.	X	X	X	Public Works

Goal 3 (continued): Use pedestrian and bicycle-friendly standards, procedures and ordinances for pedestrian and bicycle facilities and roadways, following Crime Prevention Through Environmental Design (CPTED) principles where applicable.

Objective	Action	Time Frame 2000-01	2001-03	2003-05	Recommended Offices of Primary/Secondary Responsibility
B. Provide pedestrian and bicycle facilities as part of routine roadway maintenance and improvements.	1. Incorporate consideration of pedestrian and bicycle travel and safety in all routine roadway rehabilitation projects.	X	X	X	Public Works
	2. Prioritize and add sidewalks and multi-use lanes or paved shoulders to existing roadways that are not planned to be reconstructed or will not be reconstructed for several years.		X	X	Public Works
	3. Provide multi-use lanes or paved shoulders on collector and arterial roadways as standard procedure on repaving projects.		X	X	Public Works

Goal 3 (continued): Use pedestrian and bicycle-friendly standards, procedures and ordinances for pedestrian and bicycle facilities and roadways, following Crime Prevention Through Environmental Design (CPTED) principles where applicable.

Objective	Action	Time Frame 2000-01	2001-03	2003-05	Recommended Offices of Primary/Secondary Responsibility
C. Prioritize and provide spot pedestrian and bicycle safety improvements based on safety reviews and community input.	1. Conduct periodic assessments using Town staff and community involvement to identify areas in need of pedestrian and bicycle improvements.	X	X	X	Public Works/Oro Valley Police Department
	2. Provide "Share the Road" and "Watch for Pedestrians" signs and other measures to improve safety at identified high-priority locations.	X	X	X	Public Works
	3. Provide high-visibility crosswalks and other enhanced pedestrian and bicycle crossings of major roadways for sidewalk and shared-use path crossings.	X	X	X	Public Works
	4. Provide shaded, landscaped sidewalk and shared-use pathways that meet CPTED guidelines. Identify locations for these facilities to serve as key transportation and recreational linkages within the Town's pedestrian and bikeway system.		X	X	Public Works/Oro Valley Police Department

Goal 3 (continued): Use pedestrian and bicycle-friendly standards, procedures and ordinances for pedestrian and bicycle facilities and roadways, following Crime Prevention Through Environmental Design (CPTED) principles where applicable.

Objective	Action	Time Frame 2000-01	2001-03	2003-05	Recommended Offices of Primary/Secondary Responsibility
C. (continued) Prioritize and provide spot pedestrian and bicycle safety improvements based on safety reviews and community input.	5. Utilize design guidelines which conform with the Americans with Disabilities Act (ADA) for pedestrian facilities and paved shared-use paths.	X			Public Works
	6. Develop and utilize a Town of Oro Valley Pedestrian and Bicycle Facilities Design Guidelines based on the 1999 AASHTO Guide for the Development of Bicycle Facilities, 1988 Arizona Bicycle Facilities Design Guidelines, 1995 State of Oregon Bicycle and Pedestrian Plan, and other appropriate and up-to-date reference documents.	X			Planning and Zoning/Public Works

Goal 4: Develop and implement Town-supported programs to encourage pedestrian and bicycle usage and safety.

Objective	Actions	Time Frame 2000-01	2001-03	2003-05	Recommended Offices of Primary/Secondary Responsibility
A. Implement a comprehensive program to increase public awareness of the benefits of walking and bicycling.	1. Utilize video and audio Public Service Announcements (PSAs) to promote walking and bicycling for commuting and recreation and to promote safety.		X		Oro Valley Police Department/Parks and Recreation
	2. Provide funding to support public walking/bicycling awareness programs and "Share the Road" campaigns.		X		Oro Valley Police Department/Parks and Recreation
	3. Promote organized bicycle racing as a viable sport for public viewing and participation and as a means of increasing public awareness of the potentials of bicycling.		X		Oro Valley Police Department/Parks and Recreation
	4. Work with the Centers for Disease Control, health maintenance organizations, and other health/fitness organizations to promote walking and bicycling.		X		Oro Valley Police Department/Parks and Recreation

Goal 4 (continued): Develop and implement Town-supported programs to encourage pedestrian and bicycle usage and safety.

Objective	Actions	Time Frame 2000-01	2001-03	2003-05	Recommended Offices of Primary/Secondary Responsibility
B. Educate drivers, pedestrians and bicyclists on legal, safe, and predictable traffic behavior.	1. Publish a handbook of safety tips and laws for drivers discussing how to drive when around pedestrians and bicyclists.	X	X	X	Oro Valley Police Department
	2. Publish a user-friendly Walking and Bicycling Handbook, including safety tips and laws related to walking and bicycling.	X			Oro Valley Police Department
	3. Support effective driver, pedestrian and bicycle education programs in schools as part of education requirements.	X	X	X	Oro Valley Police Department
	4. Use videos to promote proper and legal driver, pedestrian and bicyclist behavior.		X	X	Oro Valley Police Department
	5. Provide specific line-item funding to support driver, pedestrian and bicyclist education.	X	X	X	Oro Valley Police Department
	6. Support helmet usage through educational brochures and programs and through distribution of free helmets.	X	X	X	Oro Valley Police Department

Goal 4 (continued): Develop and implement Town-supported programs to encourage pedestrian and bicycle usage and safety.

Objective	Actions	Time Frame 2000-01	2001-03	2003-05	Recommended Offices of Primary/Secondary Responsibility
B. Educate drivers, pedestrians and bicyclists on legal, safe, and predictable traffic behavior.	7. Develop and implement driver, pedestrian, and bike offender diversion program (i.e., community service and/or education program) to enhance enforcement efforts.	X	X	X	Oro Valley Police Department
C. Implement a traffic law enforcement program for pedestrians, bicyclists, and motorists.	1. Develop materials for law enforcement to support bicycle education and enforcement efforts.	X			Oro Valley Police Department
	2. Target high accident behavior including jaywalking, wrong-way bicycle riding, bicycling at night without lights, running of stop signs or signals by bicyclists and motorists, speeding, and aggressive driving.	X	X	X	Oro Valley Police Department
	3. Pursue maximum penalties for hit-and-run and aggressive driving and actively educate drivers that hit-and-run and aggressive driving violations will not be tolerated and will be prosecuted to the full extent of the law.	X	X	X	Oro Valley Police Department

Goal 4 (continued): Develop and implement Town-supported programs to encourage pedestrian and bicycle usage and safety.

Objective	Actions	Time Frame 2000-01	2001-03	2003-05	Recommended Offices of Primary/Secondary Responsibility
C. Implement a traffic law enforcement program for pedestrians, bicyclists, and motorists.	4. Fund the bicycle police patrol to help address high-risk traffic infractions by pedestrians and bicyclists and to promote police relations within the community	X	X	X	Oro Valley Police Department
	5. Implement a traffic law education program for law enforcement personnel which focuses on driver, pedestrian, and bicyclist interaction and laws.	X	X	X	Oro Valley Police Department
	6. Establish a local bicycle helmet ordinance that requires helmets on children up to age 16. Model this helmet ordinance after existing successful ordinances.	X			Oro Valley Police Department
D. Implement a user-responsive maintenance program to provide high-standard maintenance of roadways, pedestrian facilities, and bicycle facilities.	1. Fix damage and remove debris on pedestrian and bicycle facilities on a timely basis. Be responsive to requests.	X	X	X	Public Works
	2. Provide drainage grates that are bicycle-safe. Avoid use of pea-gravel sealcoating.	X	X	X	Public Works
	3. Maintain walkways and bike-ways to high safety standards within construction zones.	X	X	X	Public Works
	4. Increase maintenance budgets and staff to appropriately maintain roadway, bikeway and pedestrian facilities	X	X	X	Public Works

Goal 5: Develop and maintain databases useful for pedestrian and bicycle planning, prioritization of improvements, and accident prevention.

Objective	Actions	Time Frame 2000-01	2001-03	2003-05	Recommended Offices of Primary/Secondary Responsibility
A. Develop and maintain a pedestrian and bicycle route inventory.	1. Review and model after other jurisdictions' inventory systems and practices.	X			Planning and Zoning/Public Works
	2. Establish and update the inventory system on GIS.	X	X	X	Planning and Zoning/Public Works
B. Establish and maintain a pedestrian and bicycle accident database.	1. Utilize database to identify high accident locations and/or high accident severity locations to help in the prioritization of projects and programs.	X	X	X	Oro Valley Police Department/Public Works
C. Conduct pedestrian and bicycle counts on an annual basis throughout the Town.	1. Conduct before and after pedestrian and bicycle counts for roadways that are improved with pedestrian pathways or are reconstructed or restriped to include multi-use lanes for use by bicyclists.		X		Public Works
	2. Utilize counts and community surveys to prioritize improvements.		X	X	Planning and Zoning/Public Works
D. Periodically conduct public opinion surveys on walking and bicycling.	1. Conduct surveys to determine why people do or do not walk or ride bicycles, to determine pedestrian/bicycle trip patterns and purposes, and to get input on pedestrian/bicycle projects and programs that could improve walking and bicycling in Oro Valley.		X	X	Planning and Zoning/Public Works

Goal 6: Encourage land uses which foster pedestrian and bicycle travel.					
Objective	**Actions**	**Time Frame**			**Recommended Offices of Primary/Secondary Responsibility**
		2000-01	**2001-03**	**2003-05**	
A. Working with Town planners and private developers, promote mixed-use developments which incorporate residential, commercial, work, and recreational uses and thereby help reduce the need for longer-distance automotive trips.	*1. Promote mixed-use development as part of the General Plan Update.*	X			*Planning and Zoning*
B. Emphasize pedestrian and bicycle facilities within and between developments to encourage walking and bicycling as major modes of travel	*1. Encourage connections between existing developments in order to facilitate shorter trips by walking and bicycling rather than requiring longer trips which encourage the use of the automobile.*	X	X	X	*Planning and Zoning/Public Works*
	2. Enact standards which require connections between new and existing developments.	X			*Planning and Zoning/Public Works*
	3. Provide access through developments for pedestrians and bicyclists at a maximum of 400-foot intervals.	X			*Planning and Zoning/Public Works*

Goal 6 (continued): Encourage land uses which foster pedestrian and bicycle travel.					
Objective	**Actions**	**Time Frame**			**Recommended Offices of Primary/Secondary Responsibility**
		2000-01	**2001-03**	**2003-05**	
C. Promote traffic calming within developments through the use of traffic circles, speed humps, diverters, and other measures to encourage slower traffic speeds	*1. Research existing programs and design standards in other jurisdictions.*	X			*Planning and Zoning/Public Works*
	2. Develop and implement a Town "Narrow Streets" ordinance.		X		*Planning and Zoning/Public Works*
	3. Identify and correct problem areas to improve safety.		X	X	*Public Works*

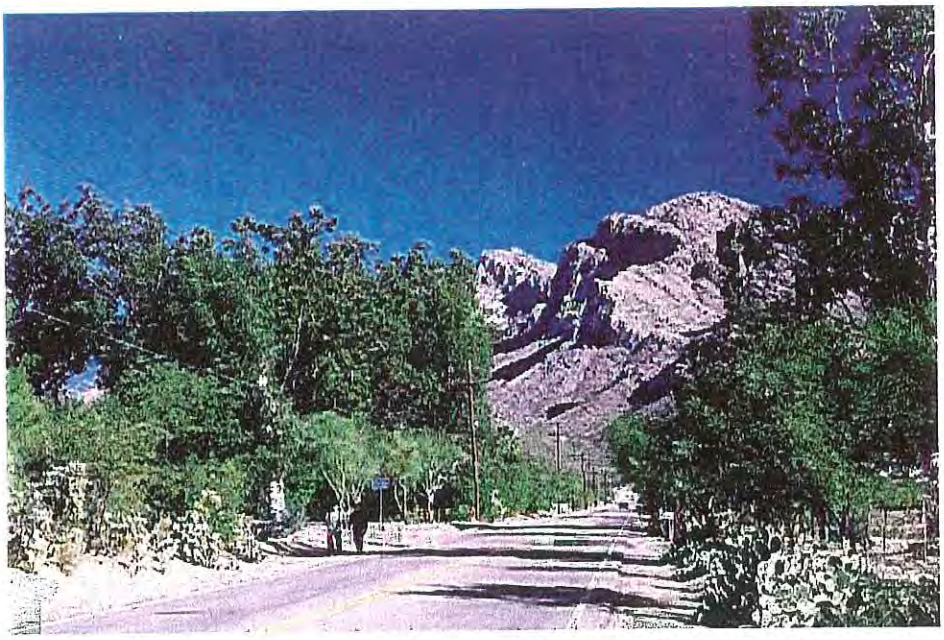
7. Conclusion

Achieving the Vision

The first-ever *Town of Oro Valley Pedestrian and Bicycle Plan* presents a unique opportunity to become an "Outstanding Pedestrian and Bicycle Friendly Community" in Arizona. This plan, the result of hard work by Town citizens and staff, demonstrates the Town's strong commitment to provide healthy lifestyle opportunities for Town residents and visitors.

The *Oro Valley Pedestrian and Bicycle Plan* provides a blueprint for developing high-standard pedestrian and bicycle facilities over the next 10 years and for establishing good pedestrian and bicycle support programs that will help people enjoy walking and bicycling activities. As the first plan for the Town and covering only a 10 year period, it provides an effective start that should help the Town establish pedestrian and bicycle planning and facilities as part of all of its public improvements.

Bringing the plan to fruition over the next 10 years will result in a dramatic increase in pedestrian and bicycle facilities over today's conditions. Sidewalk facilities will increase from approximately 18 linear miles to over 45 linear miles by 2010. Off-street shared-use paths, of which there is less than a quarter-mile in the Town today, will increase to over 9 miles. There are no enhanced-safety pedestrian and bicycle crossings in the Town today, whereas by 2010 there will be at least 14 such crossings.



Pedestrians and bicyclists will more safely enjoy the natural beauty of Oro Valley as the Plan is implemented over the next 10 years

Approximately 30 miles of local-street bicycle routes can be developed throughout the Town by 2010, compared to a lack of bicycle routes today. Some of these routes can receive traffic calming improvements in neighborhoods to further increase safety for pedestrians, bicyclists, and drivers. Nearly 40 total miles of multiuse lanes and paved shoulders will be provided throughout the Town by 2010, increasing from roughly 20 miles today. A strong annual budget is also included for spot pedestrian and bicycle

improvements which may be identified in upcoming years by citizens and the Town as high-priority needs.

These improvements will be augmented by such support facilities as landscaping, water and rest stops, and convenient bicycle parking, and by support programs including improved educational opportunities and promotional events such as "Bike and Walk Week". Support facilities and programs can be as necessary and effective as the primary pedestrian and bicycle sidewalks and bikeways in encouraging people to walk and bicycle more.

The *Town of Oro Valley Pedestrian and Bicycle Plan* demonstrates the will of citizens and staff to provide healthy outdoor opportunities, and will require concerted effort from the Town for its implementation. With strong community support and involvement, a cultural shift can take place over time within the Town wherein pedestrian and bicycle activities become a norm in an adult's or child's life for leisure trips, shopping, commuting, and traveling to schools and parks. This is a major objective in achieving the Vision of the *Town of Oro Valley Pedestrian and Bicycle Plan*—to become an "Outstanding Pedestrian and Bicycle Friendly Community"—so that walking and bicycling become a natural and inherent part of everyday life.

Appendices

Public Input

Review of Plans and Programs

Summary Results of Questionnaire

Oro Valley Pedestrian and Bicycle Plan

1st Public Open House

Target Grand Opening

3/7/99

(83 questionnaire responses were received)

1. Would you consider the Town of Oro Valley pedestrian and bicycle-friendly or in need of improvement?

Record No.	Pedestrian and Bicycle Friendly	In need of improvement	No answer/unclear
1		1	
2		1	
3		1	
4			1
5			1
6		1	
7		1	
8	1		1
9		1	
10		1	
11		1	
12		1	
13		1	
14			1
15		1	
16		1	
17		1	
18			1
19		1	
20		1	
21		1	
22		1	
23			1
24		1	
25		1	
26			1
27		1	
28		1	
29	Somewhat bicycle-friendly	Somewhat bicycle-friendly	
30			1
31			1
32		1	
33		1	
34			1
35		1	
36			1
37		1	
38		1	
39		1	
40	Somewhat		1

(Question No. 1 continued)

1. Would you consider the Town of Oro Valley pedestrian and bicycle-friendly or in need of improvement?

Record No.	Pedestrian and Bicycle Friendly	In need of improvement	No answer/unclear
41		1	
42		1	
43			1
44		1	
45			1
46		1	
47			1
48		1	
49			1
50		1	
51		1	
52		1	
53		1	
54		1	
55		1	
56			1
57		1	
58		1	
59		1	
60			1
61		1	
62		1	
63		1	
64			1
65		1	
66		1	
67		1	
68		1	
69		1	
70			1
71		1	
72		1	
73		1	
74			1
75		1	
76			1
77	Some areas		1
78		1	
79		1	
80			1
81	1		1
82		1	
83			1
Total	**2**	**56**	**26**

2. Do you currently walk or bicycle in Town? If so, what are your favorite locations for walking or bicycling, and why?

Record No.	Walk/Bike	Favorite Locations	Why
1	y	Rancho Vistoso, Catalina State Park, CDO Wash	
2	y	The Chutes, Mt. Lemmon	Trails challenging
3	y	Rancho Vistoso (RV)	Beautiful
4	y		
5	y	Wash path	
6	y	RV	
7	n	Don't like Oracle Rd, too much traffic	
8	n		
9	y	Washes	No bike paths in town
10	y	RV	
11	y	Country Club	Low traffic, polite drivers
12	n		No bike path
13	y	RV, but deadly section of Tangerine Road to get there	
14	y	RV	
15	y	Washes	
16	y	Rillito (not in Town)	Safe/user friendly
17	y	RV, Oracle--need bike lanes both sides in RV	Safe, wide bike area on Oracle
18	y	Lambert to La Canada Road	
19	y	Off main roads	
20	y	Desert Sky Road area	
21	y	Neighborhood and on La Canada, Naranja to Lambert	Need bike lanes
22	y	Oracle Road (biking), private roads (walking)	
23	y	RV, Catalina State Park	
24	n		Traffic too dangerous
25	n		Traffic, no area for bikes
26	y	Along CDO wash	
27	y	La Cholla and La Canada	
28	y	RV	Nice bike lane
29	y	Neighborhood and RV	
30	y	RV	
31	y	Oracle, 1st Ave to Catalina State Park	Good shoulder on Oracle
32	n		Unsafe
33	y	Washes	Need bike lanes
34	n	Not able to walk or bike, but support more improvements	
35	n		Need bike lanes
36	y	Canada Hills & La Canada, Lambert to Naranja	Good bike lanes
37	y	Monterra Knolls & Vista & CDO wash	
38	n		Need safe areas for bikes/peds
39	y	RV, Oracle Road (but getting too busy)	Beautiful areas
40	y	Oracle & First--accessible to stores I need to get to	
41	y	Walk in neighborhood and on streets	Lack of trails/sidewalks
42	y	Oracle Road, Magee, Thornydale	
43	y	River Road (not in Town)	
44	y		
45	y	RV	Close to home
46	n		Lack of paths & traffic-free areas
47	y	RV	

(Question No. 2 continued)

2. Do you currently walk or bicycle in Town? If so, what are your favorite locations for walking or bicycling, and why?

Record No.	Walk/Bike	Favorite Locations	Why
48	y	RV	Bicycle-friendly
49	y	Back streets	Low traffic
50	y	Copper Creek to Smiths	
51	y	To Fryes	
52	y	La Reserve area	
53			
54	y	La Canada, Lambert, Shannon, RV	
55	y	RV-has bike lanes. 1st, Lambert, and Naranja are bad--no bike lanes	
56	y	Smiths	
57	y	Oracle and Northern	Have bike lanes
58	y	RV	
59	y	Pusch Ridge	
60	y		
61	y	Naranja, 1st, Tangerine	
62	n		Too dangerous, not enough areas
63	y	RV, Woodburne Road	
64	y	Areas which have less traffic	
65	y	Copper Creek	Safe, protected
66	y	Near OV Golf Course (walk) La Canada, Naranja, 1st Ave, Oracle Road (bike)	
67	y	Neighborhood (walk), within 3 miles radius of home (bike)	
68			Don't like to bike w/heavy traffic
69	y	RV	Best safety
70	y	Pyramid Point Drive	
71	y	Around common areas and roads	
72	y	Oracle Road	
73	y	RV	Beautiful scenery/open bike lanes
74	y	Neighborhood, Canada Ridge	
75	y	Lambert Lane (walk)	Need bikeway on Lambert
76	y	River Road path, around my development	
77	y	RV	
78	n		Would bike if made safe
79	y	RV	
80	y	Oro Valley, where there's less traffic, hills	
81	y	Lambert, Catalina State Park (walk and run)	
82	y	RV	Close to home
83	y	Catalina (not in Town)	

Summary	69	Yes, bike or walk in Town
	12	No, don't bike or walk in Town
	2	No answer
	22	Bike or walk on Rancho Vistoso Blvd
	9	Bike or walk on Oracle Road
	7	Bike or walk along washes

3. If you don't walk or bicycle, why not, and what can be improved so that it will be easier or more attractive to do so?

Record No.	What can be improved?
1	
2	Need to finish Coyote Trail in Rancho Vistoso or finish sidewalks on both sides of RV Blvd for walking
3	
4	Need lighting improvements
5	
6	
7	Need trails and paved trails
8	Reduce speed limits
9	
10	
11	
12	Provide sidewalks, lighting and security
13	Improve Tangerine and 1st Avenue
14	
15	
16	
17	Don't like just one side only for biking--too dangerous for pedestrians, runners, and bikers
18	
19	
20	
21	Need bike lanes
22	
23	
24	Traffic is too dangerous
25	Too much traffic, no areas protected for bicycles
26	
27	
28	
29	Need marked paths
30	
31	
32	Need to improve safety
33	Need more bike lanes
34	
35	Bike lanes
36	
37	
38	
39	Wider paths--away from cars
40	
41	
42	
43	
44	
45	
46	Need more paths and traffic-free areas
47	

(Question No. 3 continued)

3. If you don't walk or bicycle, why not, and what can be improved so that it will be easier or more attractive to do so?

Record No.	What can be improved?
48	
49	
50	
51	Need paths and sidewalks further away from cars
52	Improvement needed
53	
54	
55	
56	
57	Bicycling is limited due to limited bike paths or shoulders, ie. La Canada between Ina and Lambert
58	
59	
60	
61	
62	Too dangerous--not enough areas
63	1st Avenue needs to be widened to include a hiking/bike lane
64	
65	
66	
67	
68	Don't like to bike on street with heavy traffic
69	
70	
71	Need some wider roads
72	
73	Have curtailed cycling because of construction traffic making it dangerous to ride and leaving debris.
74	
75	
76	
77	
78	I would bicycle if it were made safe
79	Make better lanes on 1st and Tangerine. Also, some flat areas needed for beginners (not so hilly)
80	
81	
82	Would prefer to have designated walk/run/bike paths away from traffic.
83	

Summary Results of Questionnaire
Oro Valley Pedestrian and Bicycle Plan
2nd Public Open House
Dennis Weaver Park
4/17/99

(41 questionnaire responses were received. Note that question 2 is listed in right hand column)

1. Does the Draft Pedestrian System Map adequately address pedestrian needs?

Record No.	Yes	No	No answer/unclear	Comments (Question No. 2)
1		1		Not enough walk/bike routes, off-road routes
2			1	Need more mountain bike trails
3	1			
4		1		Along La Cholla Road the sooner the better
5	1			
6	1			
7	1			
8	1			
9	1			
10	1			
11	1			
12		1		Trail heads need to be identified clearly
13	1			
14	1			Completion dates too distant
15	1			Copper Creek needs trails first before Rancho Vistoso
16	1			
17			1	Would prefer areas without sidewalks get them before
18	1			areas like Rancho Vistoso gets them on both sides, such
19			1	as Tangerine & Naranja
20			1	
21	1			
22	1			
23	1			Perhaps putting a walkway between Hardy & Naranja Dr.
24	1			
25			1	
26	1			
27			1	A walk and bikeway across CDO to new park & shopping
28		1		More smooth isolated bike paths
29	1			
30		1		
31	1			Rest stops and "watering holes"
32	1			Would love to see more bike and ped paths near Naranja
33	1			and La Canada--lots of kids in area
34	1			
35	1			Tangerine Rd needs high priority or someone's going to
36	1			get hit
37	1			
38	1			
39	1			Need 8-foot wide multiuse lanes
40	1			Need more trails on northern end
41	1			
Total	**30**	**5**	**6**	

(41 questionnaire responses were received. Note that question 4 is listed in right hand column)

3. Does the Draft Bicycle System Map adequately address bicycle needs?

Record No.	Yes	No	No answer/unclear	Comments (Question No. 4)
1		1		Need more bike lanes/off-road routes, more loop trails
2			1	Need more mtn. bike trails, trails safer & air is cleaner
3	1			
4	1			
5	1			
6	1			
7	1			
8	1			
9	1			
10		1		Get path to Wilson ASAP, get Tangerine to safe status,
11	1			funnel paths to R.V. Blvd as it is great exercise ride
12	1			Need wider lanes
13	1			
14	1			
15	1			
16	1			
17			1	Speed up the process--OV needs to catch up to Tucson
18			Somewhat	Need routes toward Tucson improved first to facilitate safer commutes from OV (La Canada to Ina)
19		1		Shoulders on Tangerine for bikes and 1st Ave
20			Need more	4-foot to 6-foot shoulders on Tangerine and 1st Ave
21			1	
22	1			
23	1			
24	1			
25			1	Put a park in Rancho Vistoso community
26				
27			1	A walk and bikeway across CDO to new park & shopping
28		1		More smooth, isolated, quiet bike paths
29	1			
30		1		Need more
31	1			Rest stops and "watering holes"
32	1			Would love to see more bike and ped paths near Naranja
33	1			and La Canada--lots of kids in area
34	1			Tangerine dangerous to bicyclists and should be addressed now. Need more education & bike lanes
35	1			How about more trails along washes?
36	1			
37	1			
38		1		Need to address mtn. bike trails like 50-year trail
39	1			Need 8-foot wide multiuse lanes
40	1			
41	1			
Total	**27**	**6**	**5**	

Review of Existing Plans, Policies, and Programs
Town of Oro Valley Pedestrian and Bicycle Plan

The purpose of this task is to work with Town staff, the steering committee, and outside agencies such as ADOT and PAG to identify current policies, adopted plans and improvement programs related to bicycle and pedestrian travel within the Town and its sphere of influence. As part of this task, policies and programs are evaluated in terms of current and anticipated problem areas relative to access, safety, modal interchange (bike to bus, for example), and facility needs. This task also evaluates current Oro Valley design standards for pedestrian and bicycle facilities.

Presented below is a review of fifteen principal documents which relate to pedestrian and bicycle travel in the Town of Oro Valley and its environs. This working paper summarizes the key findings of the documents that pertain to pedestrian and bicycle travel to help guide the development and implementation of the *Town of Oro Valley Pedestrian and Bicycle Plan.*

1. Focus 2020: Town of Oro Valley General Plan, July 1996

Key Findings:

- Adopted street standards require multi-purpose lanes to be designed in conjunction with all new roadway facilities having a right-of-way of 150 feet or greater.
- Development of alternative modes including public transit, bicycling, and walking is one means of reducing traffic volumes and will need greater emphasis.
- Build sidewalks, sufficient outside lane width, and provide other specific provisions for safe and convenient use of arterials and collectors by bicyclists and pedestrians. Bike, vehicle and pedestrian conflicts are to be minimized through appropriate design standards.
- Design a transportation network that promotes the reduction of traffic volumes and vehicle miles traveled. Bike paths should be constructed, where feasible, to separate bike and pedestrian traffic from motorized vehicles in order to provide safe access to schools and parks. All new or reconstructed collectors and arterials should include sidewalks. Oro Valley should develop and implement a community open space network with trails. Work with major employers to promote trip reduction programs.

2. Town of Oro Valley Parks, Open Space, and Trails Master Plan (POST), 1994

Key Findings:

- Develop a Bike Paths system that is separate from the roadways and serves to interconnect various public facilities such as schools, parks, trails, open space areas, etc.

- There are opportunities to enhance the ability to circulate within the community by developing a network of bike paths that are separated from the paved road system for safety and aesthetics. This system can be separated from the paved road either by buffers or utilizing existing utility easements or trails such as the Western Area Power Authority electric easement and the Cañada del Oro Wash. Ideally, this system can connect residential subdivisions with destinations such as schools, parks and commercial centers to provide an alternative and safe means of transportation within the community.
- Right-of-way along roads should include room for two-way bike path/berm with vegetation/horse-pedestrian trail. Typical roadway cross-sections should also have on-street bike lanes.

3. Town of Oro Valley Tangerine Road Corridor Plan and Overlay District, 1997

Key Findings:

- Traffic circulation, along with other modes of transportation (pedestrian, cycling, equestrian) represents a major consideration in framing Plan directions.
- Provide road crossings for cyclists, pedestrians, equestrians.
- Safety is preferred over speed; consider infrastructure efficiencies for multimodal and recreational users.
- New travel lanes might best be placed in the northernmost portion of the right-of-way, the existing roadway facility should be converted for frontage road and bicycle/pedestrian access.
- Protected strategic connections should be an essential component of roadway design to maintain community linkages between neighborhoods north and south of Tangerine. Pedestrian and bicycle crossings should be directed to safe locations (such as near Copper Creek School) with landscape barriers preventing unprotected crossings.
- The trail that follows the Western Area Power Authority transmission line corridor, crossing Tangerine Road approximately one-half mile west of Rancho Vistoso Boulevard, should be given consideration for use by equestrians, pedestrians, and bicyclists.
- Potential open space or park sites along Tangerine should have special provisions for safe access by vehicles, pedestrians, bicyclists, and equestrians.
- Separation between housing areas north and south of the improved roadway should be minimized, with planned connections, particularly safe undercrossings of Tangerine, for pedestrians and cyclists. Internal circulation safety for school children should be planned into residential development patterns.
- Alternative modes' (pedestrian/hiking trails, bicycle and equestrian facilities) safety objectives are promoted by planned separations from vehicular traffic,

establishing Town standards for surfacing, clearances, widths, and attention to future crossing needs.

- Pathway linkages are to be provided within each development and connecting with pathways, trails or bike lanes paralleling or otherwise linking to Tangerine Road.

4. **Town of Oro Valley Subdivision Street Standards (undated)**

Key Findings:

- Bike lanes shall be required for all major collector and arterial roadways.
- Major collector streets may be required to have distress lanes. These lanes shall be in addition to the lanes of travel and shall be a minimum of eight (8) feet in width for roadways with an ADT of 4,000 or more.
- Bike lanes and distress lanes may be designed as a combined feature if a total minimum pavement widening of eight (8) feet is provided. The lanes must be striped, and parking shall be prohibited.

5. **Town of Oro Valley Zoning Code, Revised 1998**

- For proposed developments within 1 mile of a public school, describe and map safe walk/bike paths for students. Student walk/bike paths should be designed, with easements between selected lots, as required, to reduce walk/ride distances.
- Where applicable, describe and map how the proposed development will facilitate access to off-site trails. Discuss how access will be maintained.
- Pedestrian and bikeways with rights-of-way of 8 feet or greater may be required where essential for circulation or access to schools, playgrounds, shopping centers, transportation and other community facilities. Pedestrian and bikeways may be used for utility purposes.
- Planned Residential Developments may have a 5 percent increase from base density if interior amenities such as tennis courts, recreation centers, bike paths and equestrian trails which are accessible to the residents of the development are provided.
- Planned Area Developments should encourage patterns of land use which decrease trip length of automobile travel and encourage trip consolidation; increase public access to mass transit, bicycle routes, and other alternative modes of transportation; and reduce energy consumption and demand.
- Requirements for Planned Area Developments:
    1. Residential neighborhoods are afforded multi-modal access to, and are in close proximity to, activity centers to minimize travel times.

2. Bike lanes are included in all planned arterial improvements and on collectors deemed appropriate in the development review process.
3. Homeowners associations are required to maintain pedestrian-bicycle paths, within approved master-planned communities.
4. Bicycle parking facilities are provided.
5. Safe pedestrian/bicycle access to schools and parks is provided within the boundaries of the development.
6. Sidewalks or related pedestrian facilities are incorporated within neighborhoods.
7. All new roadway and future pedestrian-bicycle improvements meet public design standards.
8. Pedestrian, equestrian and bicycle trails are designated including picnic/rest areas.
9. Handicapped accessible facilities are provided to users.
10. Neighborhood scale recreation and appropriate linkages to existing and planned trail systems are provided.
11. Bike paths are constructed, where feasible and appropriate, to separate pedestrian and bike traffic from motorized vehicle in order to provide safe access to schools and parks.
12. Public access to mass transit, pedestrian and bicycle circulation systems is provided and designed to assure that pedestrians can move safely and easily to properties and activities in the site and in the neighborhood.
13. The Planned Area Development provides for safe pedestrian and bicycle access to schools and parks.

- Ensure sufficient off street motor vehicle and bicycle parking facilities by establishing minimum parking requirements for land uses.
- Encourage safe, convenient, and efficient design of motor vehicle and bicycle parking spaces, circulation, and access areas.

6. Pima Association of Governments Metropolitan Transportation Plan, 1998

Key Findings:

- The plan notes that the City of Tucson, Town of Oro Valley, and Pima County have policies in place to provide bicycle lanes or paved shoulders and pedestrian facilities as part of major roadway construction or reconstruction projects. The plan anticipates that the majority of the arterial and collector roadway improvement projects will include these facilities.
- Planned roadway widenings or new roads in Oro Valley include the following:

1. Oracle Road: Calle Concordia to 1st Avenue, from 2 lanes to 4 lanes
2. Tangerine Road: La Cholla to Oracle, from 2 lanes to 4 lanes
3. La Cañada Drive: Naranja to Tangerine Road, from 2 lanes to 4 lanes
4. Lambert Lane: La Cholla to First Avenue, from 2 lanes to 4 lanes
5. First Avenue: Oracle Road to Tangerine Road, from 2 lanes to 4 lanes
6. La Cañada Drive: Hardy Road to Lambert Lane, from 2 lanes to 4 lanes
7. Palisades Road: 1st Avenue east to end, from 2 lanes to 4 lanes
8. Linda Vista Road: Oracle Road west to end, from 2 lanes to 4 lanes
9. Calle Concordia: La Cañada to Oracle Road, from 2 lanes to 4 lanes
10. Hardy Road: La Cañada to Oracle Road, from 2 lanes to 4 lanes
11. La Cañada: New 2-lane road from Tangerine Road to Moore Road
12. Moore Road: New 4-lane road from King Air Drive to Big Wash

- Based on this listing of projects and assuming 1998 Town boundaries, approximately 19 centerline miles of new bicycle and pedestrian facilities can be built within the Town by 2020 included as part of the standard roadway cross section. This does not include additional pedestrian and bicycle facilities which may be programmed and built separately as stand-alone projects.

7. PAG Regional Plan for Bicycling, 1993

Key Findings:

- Program support should be consistent for bicycling, including bicycle coordinators and regular facility maintenance.
- "Bicyclist-friendly" destinations should be consistently created.
- Bicyclist and public education and awareness should be promoted.
- For the Oro Valley area, bicycle lanes are planned for:
  1. La Cañada, Ina Road to Tangerine Road
  2. La Cholla, Ina Road to Tangerine Road
  3. Tangerine, La Cholla Boulevard to Oracle Road
  4. Naranja, La Cholla Boulevard to 1st Avenue
  5. Lambert, La Cholla Boulevard to 1st Avenue
  6. 1st Ave, Tangerine to Oracle Road
  7. Calle Cocordia/Overton, Oracle Road to La Cholla Boulevard
  8. Hardy/Overton, Oracle Road to La Cholla Boulevard
- Bicycle routes are planned for:

Calle Buena Vista, (limits undefined)

- Multiuse paths are planned for:

  Cañada del Oro, La Cañada Drive southwest to La Cholla Boulevard (both sides of the wash)

---

8. Pima Association of Governments Transportation Improvement Program, 1999-2003

Key Findings:

- A TIP open house was held March 1998 and a survey was distributed to request public input on transportation issues. The top five rated goals included:
  1. 68 percent of respondents rated "Projects should improve air quality" as a very important goal;
  2. 61 percent rated "Projects should help reduce congestion problems" as a very important goal;
  3. 58 percent rated "Projects should enhance the quality or livability of neighborhoods and other community areas" as a very important goal:
  4. 56 percent rated "Projects should help conserve energy and resources" as a very important goal; and
  5. 51 percent rated "Projects should accommodate more than one mode of travel" as a very important goal.
- The following projects for the Oro Valley area (including relevant Pima County and ADOT projects) are included in the TIP:
  1. First Ave, Oracle to Naranja: Reconstruct, widen bridge to 4 lanes, install signal (to be completed by 2003)
  2. First Ave Safety Improvements, Lambert to Tangerine: Install left turn bays, add bike lanes, grade shoulders (to be completed by 1999)
  3. Hardy Road, Northern Ave/Calle Buena Vista: Reconstruct, realign intersection (paved shoulders not mentioned, to be competed by 2001)
  4. Hardy Road, Oracle to Northern: Reconstruct, widen to 4 lanes, add bike lanes and drainage (to be completed by 2003)
  5. Hardy/Oracle traffic signal: Realign intersection, signal installation (paved shoulders not mentioned, to be competed by 1999)
  6. La Cañada Drive Extension, Tangerine to Moore Road: Design, R/W acquisition (will include paved shoulders, construction not programmed)
  7. Lambert Lane Safety Improvements, west Town limits to First Ave: Install left turn bays, add bike lanes and drainage (to be completed by 2000)
  8. Naranja Drive, La Cholla to First Ave: Reconstruct 2 lanes (paved shoulders not mentioned; to be completed by 2003)

9. Tangerine Road, First Ave to Monterra: Reconstruct, realign, drainage (paved shoulders not mentioned; to be completed by 1999)
10. Tangerine Road, Monterra to La Cañada Drive: Reconstruct, realign, drainage (paved shoulders not mentioned; to be completed by 2001)
11. (Pima County Project) La Cañada Drive, Ina Road to Lambert Lane: Design, R/W, Widen existing road to 4-lane divided with multiuse lanes (to be completed by 2003)
12. (Pima County Project) Magee Road, La Cañada Drive to Oracle Road: Widen to 4 lanes with multiuse lanes (to be completed by 2003)
13. (ADOT Project) SR 77 (Oracle Road), First Avenue to Tangerine Road: Mill and replace full width with asphaltic concrete (to be completed by 1999)

9. Tucson Bicycle Map, 10th Edition, 1998

Key Findings:

- Existing multiuse paths in the Oro Valley area include:
  1. Magee Road, Northern to Paseo del Norte
- There are no existing bike routes on local streets in the Oro Valley area
- Existing bike routes with white painted line (bike lanes) in the Oro Valley area include:
  1. La Cañada Drive, Lambert Lane to Naranja Drive
  2. La Cañada Drive, on bridge over Cañada del Oro
  3. Naranja Drive, La Cañada Drive to 0.5 miles west
  4. Rancho Vistoso Boulevard, Tangerine Road to Oracle Road
  5. Del Webb, Rancho Vistoso Boulevard to Sun City
  6. Calle Concordia, Northern to Oracle Road
  7. Northern/Calle Buena Vista, Magee to Calle Concordia
  8. Paseo Del Norte, Ina Road to Magee Road
  9. Sage Road, La Cañada west to end
- There are no existing bus/bike lanes in the Oro Valley area
- Existing paved shoulders in the Oro Valley area include:
  1. Tangerine Road, 1st Avenue to Oracle Road
  2. Glover Road, La Cholla east to end
  3. Calle Concordia, La Cañada to Marathon
  4. Oracle Road, Ina Road north beyond Town limits
- Existing bikeable local streets in the Oro Valley area include:

1. Atua, Linda Vista to Oracle Road
2. Rancho Verde, La Cañada to Calle Concordia
3. Marathon/Mahogany, Calle Concordia to Chapala
4. Camino Fairhaven, La Cañada to Oracle
5. Cool, Mahogany to Northern

- Existing higher-speed streets for experienced riders in the Oro Valley area include:
  1. La Cañada, Ina to south of Cañada del Oro
  2. La Cañada, north of Cañada del Oro to Lambert
  3. La Cañada, Naranja to Tangerine
  4. Sun City, Rancho Vistoso to Del Webb
  5. Magee, Oracle east to end

10. ADOT Map of Suitable Bicycle Routes on the State Highway System, 1998

Key Findings:

- Oracle Highway is listed as "More Suitable" for bicycling from Ina Road north through Town of Oro Valley jurisdictional limits.
- Tangerine Road is not listed on the map. (Tangerine is a State Route and not on the State Highway System).

11. Pima County Department of Transportation Roadway Design Manual, 1998

Key Findings:

- Bicycle facilities and activities within Pima County are an important part of the overall transportation system. For designs using curbed roadways, a minimum of 8 feet is to be added to the typical width of travel lanes to accommodate bicycles and other users. This 8-foot width is designated as a multiuse lane.
- For roadways considered rural and non-curbed, the typical width to accommodate travel lanes shall be increased by a minimum of 5 feet for the same purpose. Separated bicycle paths shall be examined as a design alternative where right-of-way widths are 200 feet or more and side street and driveway connections are limited.
- There are several design features which must be considered when major roadways are being planned and designed. These include:
  1. Appropriate striping and signing along roadway sections and at intersections to identify proper bicycle-vehicle interactions.

2. Location of push buttons and vehicle detectors at signalized intersections to accommodate bicycle and pedestrian activity.
3. Design of curb inlets and catch basins which do not impede bicycle activity.

- Pedestrian sidewalks shall be provided along major roadways where warranted by pedestrian travel. The standard sidewalk width is 4 feet, but may be increased to accommodate special conditions. When the sidewalk is designed to be flush with the back of the raised curb, the standard width is 6 feet.
- Other pedestrian considerations include the consideration of pedestrian crosswalks, overpasses, underpasses, or school zones where existing public or private schools operate adjacent to the arterial or collector.

12. Pima County Major Streets and Scenic Routes Plan, amended 1998

Key Findings:

- Designated Major and Scenic routes follow the requirements for pedestrian and bicycle facilities as described within the Pima County Department of Transportation Roadway Design Manual.
- Town of Oro Valley (and other incorporated entities) is excluded from the map. However, adjacent roadways are designated as follows:
  1. Oracle Highway – designated Scenic Route, planned right-of-way not depicted
  2. Tangerine Road – designated Scenic Major Route, planned right-of-way is 300 feet
  3. La Cañada Drive, La Cholla Boulevard – designated Major Route, planned right-of-way is 150 feet
  4. Moore Road, Lambert Lane, Hardy Road, Linda Vista Boulevard – designated Scenic Major Route, planned right-of-way is 150 feet
  5. La Cañada Drive – designated Major Route, planned right-of-way is 150 feet

13. Lambert Lane Bikeway Design Concept Report, April 1999

Key Findings:

- Provides the design concept for development of a paved 10-foot wide multiuse path along the south side of Lambert Lane, 1st Avenue to La Cañada Drive (a distance of 2.2 miles).
- The pathway will enhance community access to the Cañada del Oro Riverfront Park, a new Town park located south of Lambert Lane approximately 3/4 mile east of 1st Avenue. The park is scheduled to open in late 1999.

14. La Cañada Drive Extension Location Report, Tangerine Road to Moore Road, August 1999

Key Findings:

- Provides the recommended alignment and design concept for the extension of La Cañada Drive from Tangerine Road to Moore Road. The roadway is proposed to be constructed first as a two-lane roadway within the next 3 to 8 years, and converted to a four-lane roadway as traffic demand warrants.
- The proposed two-lane roadway would include 5-foot paved shoulders and a cleared pedestrian area. When upgraded to a four-lane roadway, it would include 8-foot multiuse lanes and 5-foot to 6-foot sidewalks on both sides of the roadway.

15. City of Tucson 1992 Major Streets and Routes Plan (most recent amendment)

Key Findings:

- City of Tucson 1992 Major Streets and Routes Plan requires the following improvements for bicyclists and pedestrians:

  1. Improvement of major streets shall include provisions for pedestrian ways. Sidewalks shall be located on both sides of major streets.
  2. Bus stops shall be placed every one-fourth mile except where demand warrants otherwise. Where possible, bus stops shall be located at activity nodes. Shelters and benches shall be set back at least four feet from the curb.
  3. To provide for safe use by bicyclists, major streets shall be designed with 17-foot outside lanes to provide 5-foot striped bicycle lanes, where feasible.