OREGON
BICYCLE AND PEDESTRIAN PLAN

An Element of the Oregon Transportation Plan

OREGON DEPARTMENT OF TRANSPORTATION

STATUS OF LONG RANGE PLANS

		Proposed Schedule
• Oregon Transportation Plan	Dave Bishop	Adopted 1992
• Aviation System Plan	Gary Viehdorfer	Incremental
• Bicycle and Pedestrian Plan	Michael Ronkin	Adopted 1995
• Corridor Plans	Ed Lee	Incremental
• Highway Plan	Don Byard	Adopted 1991
• Intermodal Plan	Steve Kale	Spring 1996
• Public Transportation Plan	Bob Sherman	Adopted 1997
• Rail Freight Plan	Ed Immel	Adopted 1994
• Rail Passenger Policy and Plan	Bob Krebs	Adopted 1992
• Transportation Safety Action Plan	June Ross	Adopted 1995

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OREGON
BICYCLE AND PEDESTRIAN PLAN

AN ELEMENT OF THE OREGON TRANSPORTATION PLAN

ADOPTED BY THE OREGON TRANSPORTATION COMMISSION
JUNE 14, 1995

Implementation of the Oregon Bicycle and Pedestrian Plan is dependent upon the availability of funding. Adoption of the plan by the Oregon Transportation Commission does not guarantee adequate financial resources to carry out the projects nor can the Commission commit the financial resources of other agencies or public bodies.

OREGON DEPARTMENT OF TRANSPORTATION
BICYCLE AND PEDESTRIAN PROGRAM

ACKNOWLEDGEMENTS

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PREFACE

PURPOSE OF THE PLAN

Bicycling and walking are important components of Oregon's multimodal transportation mix. This plan is a tool Oregonians can use to increase their transportation choices.

The Oregon Department of Transportation has jurisdiction over approximately 12,000 km (7,500 mi) of highways. This plan does not propose specific projects on each section of highway, but offers the general principles and policies that ODOT follows to provide bikeways and walkways along state highways. It also provides the framework for cooperation between ODOT and local jurisdictions, and offers guidance to cities and counties for developing local bicycle and pedestrian plans.

This plan serves the following purposes:

1. To implement the Actions recommended by the Oregon Transportation Plan;
2. To guide ODOT, MPO's, the cities and counties of Oregon and other agencies in developing bikeway and walkway systems;
3. To explain the laws pertaining to the establishment of bikeways and walkways;
4. To provide information to citizens interested in bicycle and pedestrian transportation;
5. To fulfill the requirements of the Intermodal Surface Transportation Efficiency Act (ISTEA), whereby each state must adopt a statewide bicycle and pedestrian plan;
6. To fulfill the requirements of Oregon Administrative Rule 660-12 (Transportation Planning Rule 12); and
7. To provide standards for planning, designing and maintaining bikeways and walkways.

ORGANIZATION OF THE PLAN

As there are similarities and differences between bicycling and walking; combining the two modes in one document ensures that both bicycling and walking receive full consideration as valid transportation options. Because bicyclists and pedestrians operate in different manners along the roadway, the design section of this plan addresses these differences.

This document consists of two sections and appendices:

- Section One, the POLICY & ACTION PLAN, contains background information, such as the importance of bicycling and walking, legal mandates and current conditions. This is followed by the goals, actions and implementation strategies ODOT proposes to improve bicycle and pedestrian transportation.
- Section Two, BIKEWAY & WALKWAY PLANNING, DESIGN, MAINTENANCE & SAFETY, will assist ODOT, cities and counties in designing, constructing and maintaining pedestrian and bicycle facilities. Design standards are recommended to ensure that a safe, attractive and convenient network of walkways and bikeways is established. The information on safety will assist law enforcement agencies, educators and others in developing programs to improve safety for all roadway users.
- The APPENDICES include a glossary, relevant statutes, sample forms, etc.

A pleasant walking environment enhances Oregon's quality of life

OTHER RELATED PLANS

This plan considers bicycling and walking transportation along public rights-of-way.

Recreational bicycling and walking and trail issues are addressed in the "Oregon Recreational Trails Plan." For information on this plan, contact:

Recreation Trails Coordinator
Oregon Parks and Recreation Department
1115 Commercial Street NE
Salem, OR 97310

Safety policies and programs are addressed in the "Transportation Safety Action Plan." For information on this plan, contact:

Transportation Safety Program
Mill Creek Office Park
555 13th Street NE
Salem, OR 97310

THE BICYCLE & PEDESTRIAN PLAN & THE TRANSPORTATION PLANNING PROCESS

The Oregon Transportation Plan (OTP) drives all transportation planning in Oregon. The Modal Plans, including the Bicycle and Pedestrian Plan, are elements of the OTP.

Using the policies established in these documents, Corridor Plans, Metropolitan Planning Organization (MPO) plans and local government Transportation Systems Plans (TSP) are developed to provide recommendations for improvements. Projects, including bicycle and pedestrian improvements, are then programmed in either the State Transportation Improvement Program (STIP) for state projects, or in local TIP's for local projects (*See the diagram on page xi for an illustration of the interrelationship of the various phases of the planning process*).

PUBLIC INVOLVEMENT

The recommended goals, actions and strategies of this plan were drafted in response to the following input from the public:

- The Oregon Bicycle and Pedestrian Advisory Committee (OBPAC), with Bicycle and Pedestrian Program staff, have held quarterly public meetings around the state since 1973.
- The Oregon Transportation Plan was developed with comprehensive public participation; the need for improved bicycle and pedestrian facilities was expressed as a high priority.
- In January 1994, input from cities, counties and interested citizens was sought via direct mailing and news releases.
- In August 1994, staff toured the state seeking input at public meetings.
- After review by ODOT staff, OBPAC and the Oregon Transportation Commission, a public review draft was circulated to all known interested parties from December 21, 1994 to February 10, 1995.
- A public hearing was held in January 1995 before adoption by the Oregon Transportation Commission on June 14, 1995.

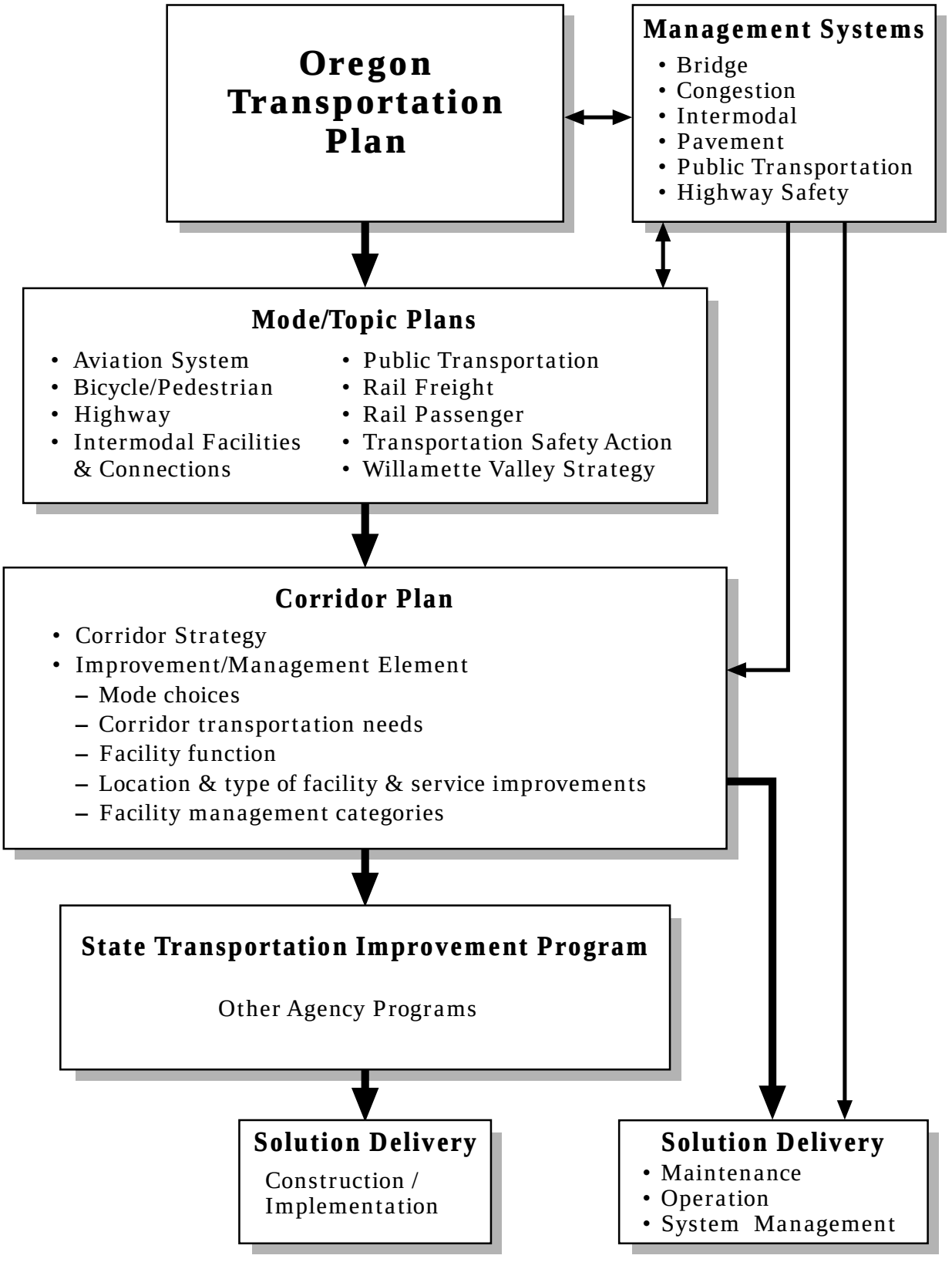
PREVIOUS PLANS

ODOT has previously adopted three Bicycle Plans, in 1984, 1988 and 1992. The present document is the first Bicycle and Pedestrian Plan, and supersedes all previous Bicycle Plans.

OTHER RELATED DOCUMENTS

See Appendix B for a listing of other related documents, such as research studies and design manuals.

INTEGRATED TRANSPORTATION PLANNING



The Transportation Planning Process

Oregonians enjoying an afternoon break on downtown benches

Riverfront path enjoyed by many users

EXECUTIVE SUMMARY

PURPOSE AND ORGANIZATION

The Oregon Bicycle and Pedestrian Plan is a modal element of the Oregon Transportation Plan. It provides direction to ODOT in establishing bicycle and pedestrian facilities on state highways. It also guides cities and counties, as well as other organizations and private citizens, in establishing facilities on local transportation systems.

The plan consists of two sections: one establishes *policies and implementation strategies*; the second presents *design, maintenance and safety* information. The appendices contain relevant statutes, proposed projects, sample forms, etc.

SECTION 1: POLICY AND ACTION PLAN

Vision: *Oregon envisions a transportation system where walking and bicycling are safe and convenient transportation modes for urban trips.*

Background Information: The importance of these modes is explained from environmental, economic and social perspectives. Bicycling and walking are often the only modes available to the "transportation disadvantaged" (the young, the elderly, the poor). Potential impacts of increased use of these modes are discussed. Many other factors, such as land use, influence walking and bicycling and are beyond the scope of this plan; their importance is mentioned to put the plan's goals in context.

The plan focuses on existing street systems in urban areas, where short trips are more realistic and where most congestion problems occur. Renovating existing streets with bikeways and walkways is emphasized, because these streets are already in place and serve community needs.

State and Federal Laws: Laws that govern the establishment of bicycle and pedestrian facilities include ORS 366.514 (the "Bike Bill"), the Statewide Planning Goals, the Transportation Planning Rule and the Americans with Disabilities Act. The "Bike Bill" is interpreted in detail, to guide ODOT and as a recommendation for cities and counties.

Current Conditions for Pedestrians and Bicyclists: An overview of conditions on both the rural and urban highway systems: conditions are generally good for bicyclists on rural highways, not very good or poor for bicyclists and pedestrians on many urban highways. Local systems with good walking and bicycling conditions are highlighted as examples to emulate.

Policy, Goals and Actions: ODOT will provide appropriate pedestrian and bicycle facilities to meet the following goal and actions:

GOAL: *To provide safe, accessible and convenient bicycling and walking facilities and to support and encourage increased levels of bicycling and walking.*

- ***ACTION 1:*** *Provide bikeway and walkway systems that are integrated with other transportation systems.*
- ***ACTION 2:*** *Create a safe, convenient and attractive bicycling and walking environment.*
- ***ACTION 3:*** *Develop education programs that improve bicycle and pedestrian safety.*

Each action is refined with specific strategies.

Implementing the Actions: ODOT will cooperate with local jurisdictions in a comprehensive planning process, the results of which will be included in corridor plans for rural highways and in local Transportation System Plans for urban highways. After determining needs and priorities, bikeway and walkway systems will be established in the following ways:

Rural highways will have shoulders widened in the course of modernization projects, as well as on many preservation overlays, where warranted.

Urban Highways require a more complex implementation strategy:

- As part of modernization projects (bike lanes and sidewalks will be included);
- As part of preservation projects, where minor upgrades can be made;
- By restriping roads with bike lanes;
- With minor betterment projects, such as completing short missing segments of sidewalks;
- As bikeway or walkway modernization projects;
- By developers as part of permit conditions, where warranted.

Cost to Implement the Plan: The overall cost to retrofit the existing urban highway system with appropriate facilities is estimated at $150 to $200 million. This would require expending $7.5 to $10 million per year to accomplish the goal in 20 years; this doubles the current ODOT expenditures on pedestrian and bicycle facilities.

SECTION 2: DESIGN, MAINTENANCE AND SAFETY

This section establishes standards for safe and attractive bikeways and walkways; maintenance practices are recommended; safety considerations are explained to assist educators and law enforcement personnel in their duties.

High standards are established so facilities do more than just accommodate current walkers and bicyclists: the purpose is also to attract new users. Other considerations, such as traffic calming, bicycle boulevards, roundabouts, etc. are presented.

Planning Walkway and Bikeway Networks: The general principles of on-street networks are presented: the importance of arterials and the relationship with other planning considerations such as land use, public transit and access management. Appropriate types of facilities are explained, as well as techniques to overcome barriers to walking and biking (busy streets, freeway crossings, etc.).

Bikeway Design: The various types of bikeways (shared roadway, shoulder bikeway and bike lanes) are discussed, as well as special considerations such as railroad crossings.

Bicycle Parking: General recommendations for cities to use in their local ordinances.

Bike Lane Restriping Guidelines: An effective and inexpensive treatment for improving conditions for bicyclists on existing roads.

Walkway Design: The basic urban walkway is a sidewalk; standards are established to meet ADA requirements; other considerations such as bus stops and planting strips are presented.

Street Crossings: The greatest challenge to pedestrian mobility is crossing the street; improvements such as islands and curb extensions are presented.

Multi-Use Paths: Previously called “bike paths,” these serve pedestrians and other users. The opportunities and challenges associated with separated paths are presented.

Intersections and Interchanges: These present challenges to users and designers, since conflicts occur where paths cross; designs to improve bicycle and pedestrian safety are presented.

Signing: Standardized signs and markings are proposed for state and local systems.

Maintenance: Recommendations are presented that will enable ODOT, cities and counties to keep facilities in a usable condition.

Safety Considerations: The major causes of pedestrian and bicycle crashes are explored. Engineering, education and enforcement solutions are presented. The information contained in this section will be refined and used to develop safety programs.

Bicycle Maps: Standards are presented so that bicycle maps have uniform legends statewide.

FIRST PART:

THE POLICY AND ACTION PLAN

THE VISION

The Oregon Bicycle and Pedestrian Plan envisions a transportation system where:

- **People can bicycle or walk safely and conveniently to all destinations within reasonable walking or bicycling distance;**
- **People can walk or ride to and from their transit stops and have a comfortable and convenient place to wait or transfer;**
- **Touring bicyclists can enjoy Oregon's natural beauty on roads and highways that are designed for bicycle travel;**
- **Appropriate transportation choices are available to all; and**
- **Streets, roads and highways are designed to encourage bicycling and walking.**

1. THE IMPORTANCE OF BICYCLING & WALKING

INTRODUCTION

Walking is the most basic form of transportation. Everyone is a pedestrian, including persons using wheelchairs and other forms of mobility assistance. Transit or automobile trips begin and end with a walk. Walking is often the quickest way to accomplish short trips in urban areas.

Bicycling is the most energy efficient form of transportation ever devised, getting the energy equivalent of up to 1,500 miles per gallon (according to an MIT study).

People who walk or ride bicycles are the most vulnerable road users, being less protected from the weather and more likely to be injured in a collision with a motor vehicle; they must often use facilities that were designed primarily for automobiles.

This plan will assist Oregonians in creating a transportation system that is readily accessible to bicyclists and pedestrians.

AN OVERVIEW OF BICYCLING IN AMERICA

Bicycles gained prominence as transportation vehicles over 100 years ago. Many early efforts to improve road conditions were sponsored by organizations such as the League of American Bicyclists. But when automobiles emerged, the situation changed rapidly. Unlike Europe, where motoring superseded cycling gradually, American cyclists had less of a chance to coexist with motorists. The bicycle's status has fluctuated through the years, and has been more often considered a child's toy than a valid mode of transportation.

In the sixties, bicycling made a comeback as people turned to bicycles for transportation and recreation, but many inexperienced riders feared motor vehicles. This viewpoint led to the bike path trend of the 1970's. Paths attempted to separate the two vehicle types to reduce conflicts. Keeping cyclists off the road with paths was not the total answer - paths function well in some areas and poorly in others.

Today, cyclists and motorists share the road. The two modes are integrated by improving roadways to accommodate cyclists, conserving funds and uniting users under one set of rules for better cooperation and safer operation. Modern bikeways do more than accommodate bicyclists - they invite them to use the roads.

The development of mountain bikes in the 1980's and hybrids in the 1990's led to another bicycle revival. Their upright sitting position, modern gear shifters and brakes, light weight, rugged construction and maneuverability make them well-suited for urban travel, especially when equipped with fenders, lights and luggage racks.

Bicycles are found in most American households; the number of cyclists is rising, particularly among adults, who outnumber child cyclists.

Bicycling in the 1950's

Established business districts traditionally see high pedestrian use

AN OVERVIEW OF WALKING IN AMERICA

Everyone is a pedestrian, and walking is not dependent on technology and fashion. Yet it too has fallen out of favor at times. Whenever alternatives were available, whether it be horses, trolleys or automobiles, walking has rarely been considered a worthy option for transportation in America. The post-war boom of the suburbs was the period in which walking suffered the greatest setback, as many streets were built without sidewalks and crossing opportunities.

Walking is often recommended as a gentle exercise for people of all ages, but the transportation role of walking is still vastly underutilized. Many people may not realize how much walking they do, since most other trips (driving or transit) are linked by walks. The exercise benefits of walking are being promoted, which could lead to increased walking as a transportation mode.

Many cities are creating pedestrian-oriented zones, which are very popular.

A. BENEFITS OF BICYCLING & WALKING

Increased bicycling and walking will help:

- Reduce traffic congestion;
- Reduce air and noise pollution;
- Reduce wear and tear on our roads;
- Reduce consumption of petroleum;
- Reduce crashes and property damage;
- Reduce the need for additional roads, travel lanes and parking; and
- Improve Oregonians' health and well-being through regular exercise.

Providing bikeways and walkways also helps meet the needs of a large segment of the population who do not have access to an automobile - the "transportation disadvantaged":

- The poor;
- The young;
- The elderly;
- People with disabilities; and
- Others who do not use a motor vehicle for a variety of reasons.

Bicycling and walking are low-cost transportation modes available to all.

In Oregon, approximately 16% of the adult population do not have a valid driver's license. Walking and bicycling are often their only transportation choices, especially in areas not served by public transportation. Walkways and bikeways create new opportunities for these groups to participate in the social, cultural and economic life of the community.

School-age children make up approximately 13% of Oregon's population. Walkways and bikeways enable school children to walk or bike more safely and conveniently to school, reducing the need for busing or automobile trips by parents.

Good bicycle and pedestrian facilities also benefit other transportation modes:

- Transit users benefit from safer, more convenient access;
- Motorists and freight carriers benefit from reduced congestion and wear and tear on our roads when more people switch from driving to other modes;
- Paved shoulders on rural highways have many safety benefits for motorists and reduce roadway maintenance costs; and
- Motorists benefit from an improved pedestrian environment: where there are sidewalks and street crossing opportunities, a person can park a car once to access several destinations. This reduces the need for additional parking spaces, "circling the block," or driving from one shopping center to the next, common behavior in urban areas without good pedestrian systems.

A bicycle and pedestrian friendly environment can have impacts beyond transportation:

- Many cities throughout the country have experienced economic benefits by enhancing non-auto transportation. Businesses benefit from improved access and an environment more conducive to "window-shopping" and strolling. Local examples include downtown Portland and Ashland.
- The number of people who feel comfortable walking or riding bicycles is a measure of the quality of life of a city, county or state.
- The presence of pedestrians and bicyclists in a city indicates that the sense of community is strong, people feel safe being outdoors, social interactions can occur openly, and children and the elderly can have access to public and private facilities.
- Tourism is an important industry, and Oregon's natural beauty and bicycle-friendly reputation attract many riders from out of state. The Oregon Coast Bike Route enjoys an international reputation. Communities benefit from bicycle riders who purchase food and other needs locally.

Trees, awnings and a sidewalk cafe contribute to a pleasant walking environment

B. WALKING & BICYCLING TRIPS

With minimal physical exertion, a person in reasonable physical condition can walk up to one kilometer, or ride a bicycle up to five kilometers or more, in less than twenty minutes - shorter than many automobile or transit commutes. It is estimated that one Oregonian in two owns a bicycle. Everyone owns shoes, and new wheelchair technology greatly increases the mobility of pedestrians with disabilities.

While bicycling and walking won't replace all trips, walking or biking can be practical for many:

- Trips to work or school;
- Visits to friends and relatives;
- Visits to offices for an appointment;
- Errands such as buying milk;
- Children's sports or music practice;
- Combined trips, such as a recreational bike ride while looking at garage sales; and
- Trips combined with other modes, such as walking to a bus stop or riding a bicycle to a car pool or park-and-ride facility.

C. BICYCLING & WALKING IN URBAN AREAS

Most of the planning and design information in this plan pertains to urban systems (all incorporated cities and some unincorporated rural communities are considered urban). Urban areas benefit most from improved bicycle and pedestrian transportation facilities because:

- Most people live in urban areas;
- Urban areas have the highest concentration of origin and destination points;
- Grocery stores, shops and services are more accessible to those without cars; and
- Average trip distances are short (typically under five kilometers), and short trips are the ones most easily made by bicycling or walking. Short automobile trips:
  1) Create much of the congestion on urban arterials;
  2) Contribute disproportionately to urban air pollution due to cold starts; and
  3) Contribute to many of the crashes in urban areas.

D. ACCOMMODATING BICYCLISTS & PEDESTRIANS ON EXISTING STREETS

Effective walkway and bikeway networks are best achieved by modifying the existing street system, rather than trying to create a separate network, for several reasons:

- **The street system already exists:** most streets have been in place since before the wide-spread use of the automobile. Many resources have been dedicated to creating this system. Creating a totally new infrastructure for pedestrians and bicyclists is not financially or physically feasible;
- **Streets take people where they want to go:** virtually all destinations are located on a street, such as homes, businesses, shops and schools. People walking or bicycling need access to these same destinations; and
- **Streets can be made safer:** most bicycle crashes are not a result of collisions with motor vehicles; bicyclists riding responsibly with traffic are at relatively low risk. Pedestrians are safer and more secure when they are on sidewalks and visible.

Good transportation policies are based on the premise that the public right-of-way is to be shared by all travel modes: well-designed roads accommodate all users.

Various travel modes are mixed in this typical Dutch street scene

Bicyclist enjoys shoulders of country road

be located in corridors that serve the transportation needs of a community, as well as providing recreational benefits - projects in more isolated rural areas often require an automobile trip just to access the path; and
- Most sources of state and federal funding are dedicated to transportation. Bicycle and pedestrian facilities must serve primarily a transportation function to be eligible under most programs.

In contrast, the benefits of walking and bicycling as transportation will never be fully realized by providing facilities for recreational use only.

E. THE COMPLEMENTARY ROLES OF RECREATION & TRANSPORTATION

Although the renewed interest in bicycling and walking arises form the transportation value of these modes, though recreational use remains significant. Walkways and bikeways designed primarily for transportation benefit people who walk or bike for recreation and exercise as well. The recreational benefits of providing transportation-oriented bicycle and pedestrian facilities include:

- The old-fashioned "walk around the neighborhood" is made possible, enhancing to the cohesiveness of a community;
- Casual bike rides can be made within the immediate vicinity of one's home;
- Longer bike rides can start at home, avoiding the need to strap bicycles to the back of a car and to travel to a bike-friendly area;
- Facilities that have been provided primarily for recreational use (off-street paths) can be linked together to serve transportation purposes, especially where these paths provide short-cuts;
- Rails-to-Trails projects in urban areas can

F. THE DESIRE FOR IMPROVED BICYCLING & WALKING CONDITIONS

Though there are many competing demands on limited transportation funds, users have repeatedly stated their desire for more and better bikeways and walkways:

- At the national level, in a 1995 Harris Poll survey, 20% of Americans said they would commute by bicycle or on foot more regularly if better facilities were provided.
- At the state level, in the ODOT Customer Satisfaction and User Demand Statewide Assessment, 30% of Oregonians stated that providing these facilities is extremely important.
- At the local level, in the 1993 Gresham Transportation Choices Survey, more than 50% of residents thought that providing bike lanes and sidewalks was very important.
- In the 1994 City of Corvallis Citizens' Attitude Survey, 64% of residents used the existing bike lanes and paths, and 89% said the facilities were excellent or good.

G. INCREASING BICYCLING & WALKING TRIPS

The Oregon Transportation Plan calls for doubling the number of bicycling and walking trips over the next 20 years.

The National Bicycling and Walking Study (commissioned by the Federal Highway Administration for the US Department of Transportation) recommends doubling the current modal share of bicycling and walking, and decreasing bicycle and pedestrian injuries and deaths by 10% over the next twenty years.

This plan's primary purpose is to implement a network of bikeways and walkways. ODOT, in cooperation with cities, counties and other agencies such as the Department of Energy, is pursuing strategies to promote greater use of alternatives to the private automobile, including public transit, carpooling, flex-hours and telecommuting.

While higher in some communities, bicycling and walking for transportation use is fairly low: statewide, approximately 4% of work trips are accomplished on foot and 1% by bicycle, (1990 US census). The census only measures work trips by people over age 15; more data are being collected to determine the share of walking and bicycling in relation to total trips.

To meet the need for low-cost, efficient transportation, planners are recognizing the benefits of bicycling and walking, and are encouraging greater use of these modes. The basic steps that can be taken are:

1. Providing bicycle and pedestrian facilities, as well as changing associated land use and building orientation;
2. Promotional campaigns; and
3. Incentives for walking and bicycling.

G.1. CONSTRUCTION OF FACILITIES

Physical improvements to the system are a logical first step. Without safe and convenient facilities, few people will walk or bike - the potential to increase use is limited by the quality of available facilities. Examples from around the nation and Oregon indicate a positive correlation between the provision of good bikeway and walkway networks and higher use:

- The National Bicycling and Walking Study indicates that one factor influencing bicycle usage in urban areas is the percentage of arterial streets with bike lanes (others factors are land use, terrain, etc.).
- Eugene* and Corvallis* experience the greatest use of bicycles for commuting to work in Oregon (6% and 8% respectively, 1990 US census). The many miles of arterial streets with bike lanes are a contributing factor in both cities; Eugene has also developed miles of multi-use paths along its rivers and canals.
- Ashland* has the highest walk to work rate (15% of trips, 1990 US census). Ashland is a compact city with transportation and land use policies that enhance the pedestrian environment.

** Note: the statistics for these "college towns" are based on surveys answered by adult heads of household. They represent the population as a whole, not the student population.*

G.2. PROMOTIONAL CAMPAIGNS

Increases in recycling and seat belt use have resulted from successful campaigns aimed at changing behavior. Similar efforts could be applied to encourage increased bicycling and walking. Successful campaigns portray a positive image of walkers and bicyclists, emphasize the benefits of bicycling and walking, and inform the public of the drawbacks associated with over-reliance on the automobile.

Even in countries with high bicycle use, promotional campaigns make a difference: the Netherlands has the highest rate of bicycle use in Europe (close to 30% of all trips); yet the city of Groningen has promoted bicycle use to an impressive 50% of all trips.

G.3. INCENTIVES

People who walk or bicycle are often at a disadvantage, facing impediments such as roads designed primarily for motor vehicles, lack of protection from the weather, inadequate

parking for bicycles at destinations and inadequate connections with other modes. To encourage greater use, incentives and rewards can include:

- Financial incentives such as tax breaks or compensation for not using automobile parking spaces;
- Facilities such as secure bicycle parking, showers and changing rooms;
- Work schedules that allow commuters to ride or walk in daylight hours in the winter;
- Relaxed dress codes;
- "Guaranteed Ride Home" by taxi, for emergencies when walking and cycling aren't practical; and
- Awards and other forms of recognition.

G.4. OTHER FACTORS

Establishing walkways and bikeways along roadways is only part of what is needed to create a pedestrian and bicycle-friendly environment. There are many improvements that make a transportation system more accessible and hospitable to pedestrians and bicyclists.

Some of these issues can be dealt with by transportation officials, and others require support from other agencies and citizens to bring about changes. These include amending land use zoning laws, enforcing traffic laws that protect pedestrians and an overall commitment to create a more human-scale urban landscape.

G.4.a. Weather

Oregon is blessed with a mild climate: moderate amounts of precipitation east of the Cascades and mild temperatures in the Willamette Valley and Southern Oregon. The state's exaggerated reputation for rain doesn't deter many cyclists and walkers from using these modes year-round. Surveys taken in Eugene, Corvallis and Bend indicate that a third of regular bicycle commuters ride year-round; others ride from March to November. Traveling in the dark may be more of a deterrent than weather.

A year-long survey conducted by an ODOT employee bicycling to work in Salem every day dispelled the myth that the climate is too wet, too cold or too dark for year-round commuting. Out of a total of 492 trips (one-way), the following conditions were recorded:

Precipitation:
- 14 trips (3%) occurred in heavy rain;
- 75 trips (15%) occurred in light rain;
- 403 trips (82%) occurred with no rain.

Surface moisture:
- 137 trips (28%) occurred on wet pavement;
- 355 trips (72%) occurred on dry pavement.

Temperature:
- 37 trips (8%) occurred in cold weather;
- 310 trips (63%) occurred in cool weather;
- 145 trips (29%) occurred in warm weather.

Light Conditions:
- 8 trips (2%) occurred in darkness;
- 81 trips (16%) occurred at dawn or dusk;
- 403 trips (82%) occurred in daylight.

Overall, 293 trips (60%) occurred under "fair-weather" conditions: daylight, no rain, dry pavement and cool or warm temperatures. A person can commute by bicycle for more than half the year in the Willamette Valley under these conditions. With lights, fenders and waterproof clothing, a person can ride year-round.

For walking, the conditions are even more conducive, since wet pavement and darkness are less of a deterrent.

G.4.b. The Ease of Using an Automobile

The experience of campaigns to promote alternate modes indicates that increasing the attractiveness of these modes is often insufficient to make substantial changes in travel behavior. When driving is inexpensive and convenient, other modes such as walking, bicycling and mass transit cannot compete effectively.

Reducing the attractiveness of driving alone can help make other means of transportation relatively more attractive. Observations of travel patterns in other developed nations indicate a correlation between the relative ease of driving and the use of other modes.

Some factors that decrease the attractiveness of driving alone are high gasoline prices, vehicle registration fees and parking rates; low availability of parking; and restricted driving privileges in downtown and other high pedestrian use areas. New car prices and insurance costs are rising faster than inflation rates; these factors could also have an impact on the cost of driving.

With increases in traffic congestion and other related problems, the public, transportation planners and elected officials increasingly recognize the desirability to decrease auto use and increase alternatives.

G.4.c Land Use

Many land use practices result in long distances between origin and destination points, requiring an automobile for most trips.

Zoning for high densities of employment, housing and mixed-use development places origin and destination points closer together, creating a more pedestrian and bicycle-friendly environment. This can be done more easily in new developments, but can be retrofitted into established areas with neighborhood commerce zoning.

Traditional corner store is within walking distance of residential area

G.4.d Connecting Streets

Disconnected streets and cul-de-sacs create long travel distances, even though the actual distance from origin to destination may be fairly short, making walking and bicycling impractical.

A grid street system provides continuity for pedestrians and bicyclists along the shortest routes; lacking this, disconnected streets can be improved with connecting paths (see figure 8, page 54).

G.4.e Street Crossings

Wide multi-lane roadways are difficult to cross on foot.

Crossing opportunities can be provided with techniques such as raised medians, refuge islands, curb extensions and pedestrian signals, where appropriate.

Pedestrians are vulnerable when crossing streets

G.4.f. Intersections

Intersections built for the movement of motor vehicles can be very difficult for pedestrians and bicyclists to cross. A network of streets with sidewalks and bike lanes does not fully accommodate pedestrians and bicyclists if intersections present obstacles. Free-turning movements for vehicles are particularly difficult situations.

Improvements for pedestrians include refuge islands, shorter crossing distances, reduced curb radii, crossings at right angles and slower traffic speeds. At busy interchanges, grade-separation for bicyclists and pedestrians may be needed.

G.4.g. Access Management

Every driveway creates conflicts for pedestrians and bicyclists.

One component of access management deals with the number of driveways connecting to the road. Reducing the number of driveways and limiting access from one or more directions improves pedestrian and bicyclist safety and comfort.

G.4.h. Public Transit

Transit use is highly dependent on pedestrian access, yet some bus routes are located on streets without sidewalks. The adjacent land use must also be conducive to transit use. Bus stops located in areas where the wait is unpleasant, with inadequate protection from the weather, reduce transit use.

Shelters, benches and lighting increase the comfort of transit users. Bike parking at transit stops increases the area served by transit.

G.4.i. Building Orientation

Buildings that are set back from the road with large parking lots in front are uninviting and difficult for pedestrians to access.

Buildings close to, and oriented toward sidewalks, with parking in the rear or on the side, are more likely to encourage pedestrian use and are more transit-friendly.

G.4.j. Traffic Noise & Perception of Danger

Roadways with sidewalks directly adjacent to noisy, high-speed travel lanes are perceived by most people as being undesirable for walking.

Greater separation, as with planting strips (especially with trees), and slower traffic speeds increase the level of comfort for pedestrians.

G.4.k. Lighting

People may be intimidated by dark streets at night; good lighting can make pedestrians feel safer.

G.4.l. Topography

Road designers and engineers have very little control over the natural lay of the land, and residential areas built in hilly terrain will generate less potential foot or bicycle traffic than those built in flatter areas.

See Part 2, Planning Principles, for a more detailed discussion of some of these factors.

Many busy urban arterials create a hostile pedestrian environment

H. POPULATION & TRANSPORTATION PROJECTIONS

Oregon's population is projected to grow faster than the nation's for most of the next 40 years (from 2.8 million in 1990 to 3.8 million in 2012 and to almost 4.0 million in 2030, according to ODOT forecasts).

Most of the growth will be in the cities of the Willamette Valley, where population densities will approach those of more urban states. Other areas that will experience rapid growth are central and southern Oregon and pockets on the coast.

Implications for Bicycling and Walking

If current usage rates stay constant, the number of bicyclists and pedestrians will increase with population; the increase will be greater if usage rates rise. The demand for more and better bicycling and walking facilities will increase.

Currently, the increase in Vehicle Miles Traveled (VMT's) per capita is outpacing population growth (four times faster). If this trend continues, the increased traffic on roads could act as a deterrent to bicycling and walking and there will be competition for road space among the surface modes (auto, truck, transit, bicycle and pedestrian). Conversely, increased congestion could prompt modal shifts, if attractive alternatives are available.

Planning for an increase in population can lead to higher urban densities, with the transportation advantages outlined in prior land-use discussions.

The transportation implications of an aging population must also be considered. Many of today's adults will live longer, yet may have mobility restrictions in their later years, increasing the need to provide fully accessible pedestrian facilities. The largest component of the population increase in the next 20 to 40 years will be the elderly, as the baby-boom generation ages. The elderly tend to have more leisure time and will demand safe and convenient places to walk or bike.

Densely populated European cities have enhanced livability by improving the pedestrian environment

2. STATE & FEDERAL LAWS RELATING TO BICYCLE & PEDESTRIAN FACILITIES

1953: ORS 366.460: Construction of sidewalks within highway right of way

This statute allows ODOT to construct sidewalks, bicycle paths and equestrian trails within highway right-of-way, provided the Department finds that such facilities will contribute to the safety of pedestrians, the motoring public or persons using the highway. By adoption of this plan, the Department of Transportation finds that sidewalks are necessary to contribute to pedestrian safety in urban and urbanized areas.

1971: ORS 366.514: Use of highway fund for footpaths and bicycle trails

Often referred to as the "Oregon Bike Bill," this law applies equally to bicycle and pedestrian facilities. The law, the first of its type in the nation, requires the development of bikeways and walkways. The intent was to ensure that future roads be built to accommodate bicycle and pedestrian travel, where warranted. It also enables road funds to be used for constructing bikeways and walkways along existing roads.

The main provisions of this statute are:

1. It requires ODOT and the cities and counties of Oregon to expend reasonable amounts of the highway fund to provide bikeways and walkways.
2. It requires the inclusion of bikeways and walkways whenever highways, roads and streets are constructed, reconstructed or relocated, with three exemptions (where there is no need or probable use, where safety would be jeopardized, or where the cost is excessively disproportionate to the need or probable use).

ORS 366.514 drives most of ODOT's bicycle and pedestrian activities. Some of the provisions of this bill have been misunderstood or misapplied, particularly the provision to expend a minimum of one percent of the highway fund on bicycle and pedestrian facilities. See Appendix C for ODOT's interpretation of ORS 366.514.

1973: ORS 366.112: The Oregon Bicycle Advisory Committee

This eight-member committee, appointed by the governor, acts as a liaison between the public and ODOT. In 1995, the Transportation Commission officially recognized their role in pedestrian issues; the committee became the Oregon Bicycle and Pedestrian Advisory Committee. They advise ODOT in the regulation of bicycle and pedestrian traffic and the establishment of bikeways and walkways. Members serve four years and hold meetings quarterly. Members include:

- An employee of a unit of local government employed in land-use planning;
- A representative of a recognized environmental group;
- A person engaged in the business of selling or repairing bicycles;
- A member designated by the Oregon Recreation Trails Advisory Council;
- At least one member under the age of 21 at the time of appointment; and
- Three members at large.

1974: Statewide Planning Goals

Senate Bill 100 created the Land Conservation and Development Commission (LCDC), which established 19 statewide planning goals aimed at preserving the natural resources, farmland and livability of the state. Goal 12 pertains to transportation and land use; it guides many of ODOT's current programs.

GOAL 12: To provide and encourage a safe, convenient and economic transportation system:

"A transportation plan shall (1) consider all modes of transportation including mass transit, air, water, pipeline, rail, highway, bicycle and pedestrian; (2) be based upon an inventory of local, regional and state transportation needs; (3) consider the differences in social consequences that would result from utilizing differing combinations of transportation modes; (4) avoid principal reliance upon any one mode of transportation; (5) minimize adverse social, economic and environmental impacts and costs;

(6) conserve energy; (7) meet the needs of the transportation disadvantaged by improving transportation services; (8) facilitate the flow of goods and services so as to strengthen the local and regional economy; (9) conform with local and regional comprehensive land use plans. Each plan shall include a provision for transportation as a key facility."

1980: Article IX, Section 3A of the Oregon Constitution

Through this constitutional amendment, the voters of Oregon limited expenditures of the state highway fund for use on streets, roads and highways only. The major effect this had on bicycle and pedestrian facilities was that highway funds could no longer be used for constructing paths in parks and other recreational areas, rails-to-trails conversions or education and promotion programs.

1991: OAR 660-12: The Transportation Planning Rule

The Land Conservation and Development Commission adopted OAR 660-12, the Transportation Planning Rule, to implement Goal 12 of the Statewide Planning Goals. It was drafted in cooperation with ODOT. In essence, the rule requires ODOT and the cities and counties of Oregon to cooperate and to develop balanced transportation systems. Two important aspects of this rule are:

- It ties land use to transportation: and
- It mandates that transportation planning reduce reliance on any one mode of transportation.

The link between land use and bicycling and walking is paramount. Most walking and bicycle trips are short. Long distances between destinations are deterrents to walking and bicycling, as are destination points designed for access only by automobile. Land use patterns created with automobiles as the intended mode facilitate their use, perpetuating transportation patterns that discourage walking and bicycling.

The Transportation Planning Rule addresses these issues through land use regulations and the provision of transit and bicycle and pedestrian facilities.

Elements that Pertain to Bicycling and Walking

The Rule requires local Transportation System Plans to include a Bicycle/Pedestrian component, establishing a network of biking and walking facilities throughout the planning area (660-12-020(2)(d)).

Some of the key requirements relating to bicycling and walking are in 660-12-045 (3):

Local governments shall adopt land use or subdivision regulations for urban areas and rural communities as set forth below. The purposes of this section are to provide for safe and convenient pedestrian, bicycle and vehicular circulation consistent with access management standards and the function of affected streets, to ensure that new development provides on-site streets and accessways that provide reasonably direct routes for pedestrian and bicycle travel in areas where pedestrian and bicycle travel is likely if connections are provided, and which avoids wherever possible levels of automobile traffic which might interfere with or discourage pedestrian or bicycle travel.
(a) Bicycle parking facilities as part of new residential developments of four units or more, new retail, office and institutional developments and all transit transfer stations and park and ride lots.
(b) On-site facilities shall be provided which accommodate safe and convenient pedestrian and bicycle access from within new subdivisions, multi-family developments, shopping centers and commercial districts to adjacent residential areas and transit stops, and to neighborhood activity centers within one half-mile of the development. Single family residential developments shall generally include streets and accessways. Pedestrian circulation through parking lots should generally be provided in the form of accessways.
(A) "Neighborhood activity centers" includes, but is not limited to, existing or planned schools, parks, shopping areas, transit stops or employment centers.
(B) Bikeways shall be required along arterials and major collectors. Sidewalks shall be required along arterials, collectors and most local streets in urban areas, except that sidewalks are not required along controlled access roadways, such as freeways.

Detailed discussions of these requirements can be found in the design section of this plan, including bicycle parking requirements and a model for developing local Transportation System Plans.

Relationship between the Transportation Planning Rule and ORS 366.514

Subsection 660-12-020 (2)(D)(d) of the Rule refers to the requirements of ORS 366.514 when it addresses bicycle and pedestrian facilities; ORS 366.514 requires ODOT to recommend construction standards.

One of the purposes of this plan is to specify the appropriate types of bikeways and walkways that will fulfill the requirements of the Transportation Planning Rule. For example, bike lanes are the appropriate type of bikeway for arterials and major collectors; refer to the design section of this plan for more details.

1991: Oregon Benchmarks

Senate Bill 636 requires the State to establish benchmarks to measure progress in critical areas. The Oregon Progress Board was created to track these measures. Benchmarks are adopted as a tool for stating concrete objectives, setting program and budget priorities, and measuring performance. Transportation issues are listed under *Benchmarks for Quality of Life.*

The 1994 benchmark that applies directly to this plan is:

138b. Percentage of streets in urban areas that have adequate pedestrian and bicycle facilities.

Benchmarks that apply indirectly to this plan are:

128. Percentage of new development where occupants are within one-half a mile of a mix of stores and services, transit, parks and open spaces.

129. Percentage of existing development where occupants are within one-half a mile of a mix of stores and services, transit, parks and open spaces.

139. Percentage of Oregonians who commute to and from work during peak hours by means other than a single-occupancy vehicle.

140. Vehicle miles traveled per capita in Oregon metropolitan areas (per year).

1991: Intermodal Surface Transportation Efficiency Act (ISTEA)

The importance of integrating all modes of transportation is demonstrated by the following excerpt:

It is the policy of the United States to develop a National Intermodal Transportation System that is economically efficient and environmentally sound, provides the foundation for the Nation to compete in the global economy, and will move people and goods in an energy efficient manner.

ISTEA recognizes the transportation value of bicycling and walking, and offers opportunities to increase consideration of bicyclists' and pedestrians' needs within the National Intermodal Transportation System.

1992: The Americans With Disabilities Act (ADA)

The ADA is a civil rights bill that affects both the private and public sector, which must provide **accessible routes** for all individuals.

A walker improves this elderly pedestrian's mobility

Exterior accessible routes include parking access aisles, curb ramps, crosswalks at vehicular ways, walkways, ramps and lifts. ODOT considers its walkways as accessible routes and is dedicated to upgrading them to ADA standards. The design chapters of this plan contain information to guide agencies in meeting these requirements.

1992: Oregon Transportation Plan (OTP)

The OTP directs ODOT and the cities and counties to integrate all modes of transportation and encourages use of the mode that is the most appropriate for each type of travel. The people of Oregon who participated in the process emphasized that all modes of transportation should be accommodated and that over-reliance on the use of the automobile should be reduced. See Appendix D for the OTP Goals, Policies and Actions related to bicycling and walking.

Walking is an important element of Oregon's transportation policy

3. THE SYSTEM ELEMENT: CURRENT CONDITIONS FOR PEDESTRIANS & BICYCLISTS

INTRODUCTION

Walking is practical for short trips, or trips with many stops; bicycles provide similar flexibility, but for longer distances, through town or to neighboring towns. Roadways designed primarily to facilitate high-speed trips by automobile can be obstacles to walking and bicycling. Yet most people will feel comfortable walking and bicycling along a roadway if well-designed facilities are provided.

For people who do not have access to an automobile, walking or bicycling are their only transportation choices. They will walk or ride on busy urban thoroughfares with no sidewalks or bikeways, since most destination points, such as stores and offices, are located along these roads. Transit users require proper walkways to walk to and from their transit stops.

Traffic counts taken in urban locations throughout the state indicate that well-designed thoroughfares with appropriate bicycle and pedestrian facilities are used more by pedestrians and bicyclists than roads without facilities.

Sidewalks and bikeways along a road are only part of the solution; many busy streets and intersections are difficult to cross and can be barriers to walking and bicycling.

A. THE RURAL ENVIRONMENT

A.1. WALKING

Pedestrian activity in rural areas is limited because travel distances tend to be great. State highways and county roads with wide paved shoulders usually provide adequate room for walking. Many older roads and highways are narrow, with poor sight distances, and do not serve pedestrians well.

There are many rural unincorporated communities in Oregon that straddle a state highway or major county road. Where population densities and roadside activity are sufficiently high, these areas deserve special consideration when planning for pedestrian access.

A.2. BICYCLING

Rural highways and county roads are considered suitable for cycling if they have paved shoulders or relatively low traffic volumes. State highways and county roads provide good opportunities for long-distance touring and shorter recreational rides. Closer to cities, these roads serve as commuter routes into the urban area from outlying residential areas.

A.3. CONDITIONS ON RURAL HIGHWAYS

Of the approximately 9,800 km (6,150 mi) of non-interstate rural state highways (outside of city limits), 78% are generally suitable for bicycling:

- 68% in western Oregon (Regions 1, 2 & 3)
- 86% in eastern Oregon (Regions 4 & 5)

45% have paved shoulders 1.2 m (4 ft) or wider:

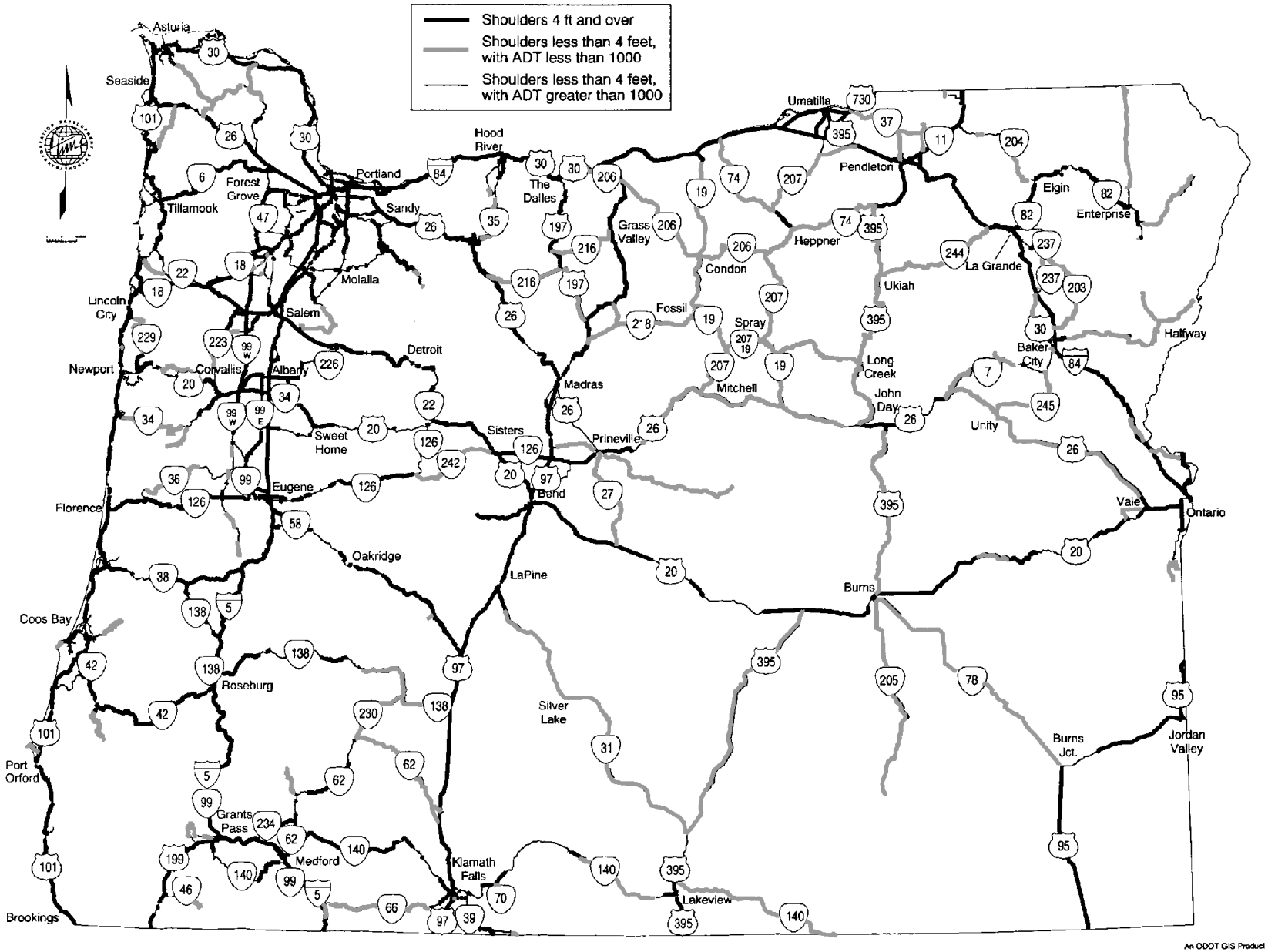
- 52% in western Oregon
- 40% in eastern Oregon

33% have paved shoulders narrower than 1.2 m, but with daily average traffic of less than 1,000 vehicles a day, which also makes them generally suitable for cycling:

- 16% in western Oregon
- 46% in eastern Oregon

Many county roads link rural destinations. The more populated counties of Oregon construct many of their roads with paved shoulders. County roads with low traffic volumes serve bicyclists well as shared roadways.

ODOT's commitment to providing wide paved shoulders as part of its standard construction practices has benefited touring, recreational and commuter cyclists, and the occasional pedestrian, while improving safety for motor vehicle traffic.



Map 1: Conditions for bicyclists on rural highways

B. THE URBAN ENVIRONMENT

INTRODUCTION

Most walking and bicycling occurs in cities, large and small. Higher population densities and closely linked destination points make walking an efficient way to cover short distances. Many older downtown areas in large cities and central business districts in smaller towns provide an environment that is conducive to walking, with sidewalks provided on most streets.

As cities grew, many once quiet streets now carry large volumes of high-speed traffic with no pedestrian or bicycle facilities, discouraging many people from using these modes. Retrofitting these streets with walkways and bikeways will make them accessible to bicyclists and pedestrians again.

B.1. LOCAL BIKEWAY MODELS

Cities that provide good bikeway networks generally experience high bicycle use. Two outstanding examples are Eugene and Corvallis:

- Eugene (pop. 117,000) is one of the leading bicycling communities in the nation. The city has built 25 miles of separated paths along the Willamette River and through parks. This path system is supplemented with 52 miles of on-street bike lanes, to form an extensive and integrated bikeway network used for recreation and commuting.
- Corvallis (pop. 46,000) has 50 miles of striped bike lanes. With 95% of its arterial and collector streets bicycle-friendly, one can ride a bicycle virtually everywhere with ease. This has contributed to the highest rate of bicycle commuting in the state (8.2%, US Census, 1990).

B.2. CONDITIONS ON URBAN STATE HIGHWAYS

In most cities, state highways serve as major arterials, potentially the most important element of a complete network of bikeways and walkways: they are the backbone into which local arterials and collectors feed. In smaller communities, the state highway is often the only arterial, connecting virtually all destination points.

Some cities have created pedestrian only areas.

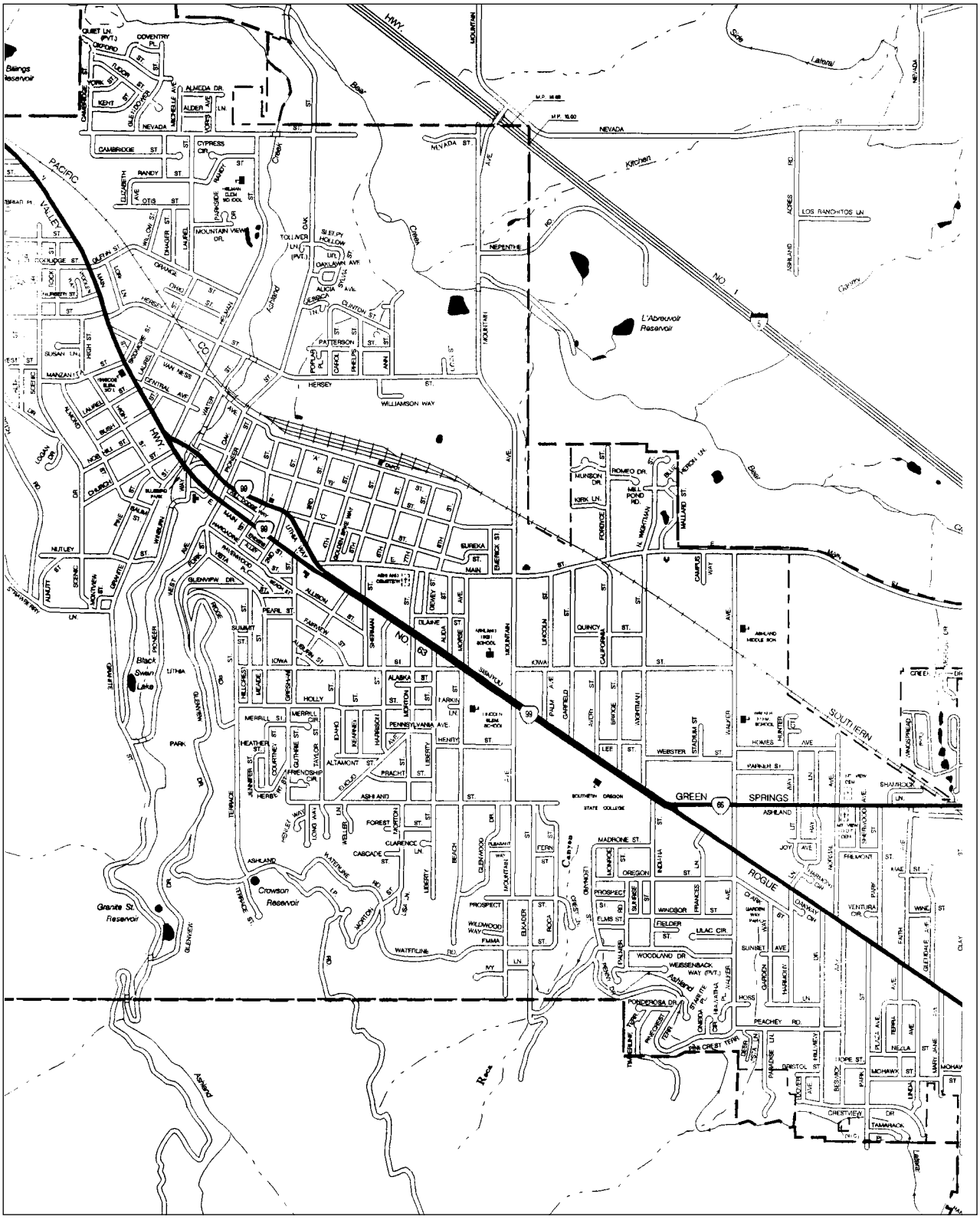
In 1993, ODOT conducted an inventory of highways in urban areas (cities with a population of 500 and above). The inventory (updated in 1994) showed that of the 1011 km (632 mi) of urban highways:

- 320 km (205 mi) (32%) have bikeways on both sides of the road (shoulders or bike lanes);
- 307 km (192 mi) (30%) have sidewalks on both sides of the road; and
- 59 km (37 mi) (6%) have bikeways and sidewalks on both sides of the road.

This last figure is low due to several circumstances:

- Sections of highway that approach urbanized areas often have adequate shoulders but no sidewalks;
- Sections within urbanized areas often have sidewalks but no shoulders or bike lanes;

A complete report breaks down the figures by region, city and highway. Other information includes the condition of sidewalks and the presence of planting strips. Maps of each city are available. Conditions on local streets are currently being assessed by cities and counties. Contact the Bicycle and Pedestrian Program for more information.



Map 2: Ashland is an example of a community where the State Highway is the main thoroughfare linking up most destination points of the community

4. THE BICYCLE & PEDESTRIAN POLICY, GOALS, ACTIONS & STRATEGIES

GOAL: TO PROVIDE SAFE, ACCESSIBLE AND CONVENIENT BICYCLING AND WALKING FACILITIES AND TO SUPPORT AND ENCOURAGE INCREASED LEVELS OF BICYCLING AND WALKING.

ACTION 1: Provide bikeway and walkway systems that are integrated with other transportation systems.

STRATEGY 1A. Integrate bicycle and pedestrian facility needs into all planning, design, construction and maintenance activities of the Oregon Department of Transportation, local governments and other transportation providers.

STRATEGY 1B. Retrofit existing roadways with paved shoulders or bike lanes to accommodate bicyclists, and with sidewalks and safe crossings to accommodate pedestrians.

STRATEGY 1C. Provide financial and technical assistance to local governments for bikeway and walkway projects on local streets.

ACTION 2: Create a safe, convenient and attractive bicycling and walking environment.

STRATEGY 2A. Adopt design standards that create safe and convenient facilities to encourage bicycling and walking.

STRATEGY 2B. Provide uniform signing and marking of all bikeways and walkways.

STRATEGY 2C. Adopt maintenance practices to preserve bikeways and walkways in a smooth, clean and safe condition.

ACTION 3: Develop education programs that improve bicycle and pedestrian safety.

STRATEGY 3A. Monitor and analyze bicyclist and pedestrian crash data to formulate ways to improve bicyclist and pedestrian safety.

STRATEGY 3B. Publish bicycling and walking maps and guides that inform the public of bicycle and pedestrian facilities and services.

STRATEGY 3C. Develop bicycling and walking safety education programs to improve skills and observance of traffic laws, and promote overall safety for bicyclists and pedestrians.

STRATEGY 3D. Develop safety education programs aimed at motor vehicle drivers to improve awareness of the needs and rights of bicyclists and pedestrians.

STRATEGY 3E. Develop a promotional program and materials to encourage increased usage of bicycling and walking.

BACKGROUND

The Oregon Transportation Plan:

The Oregon Transportation Plan regards bicycling and walking as essential transportation modes:

Bicycle and pedestrian networks should be developed and promoted in all urban areas to provide safe, direct and convenient access to all major employment, shopping, educational and recreational destinations in a manner that would double person trips by bicycle and walking.

POLICY 2D of the plan defines ODOT's policy regarding pedestrians and bicyclists:

It is the policy of the State of Oregon to promote safe, comfortable travel for pedestrians and bicyclists along travel corridors and within existing communities and new developments.

ACTION 2D.1 implements this policy:

Make walkways, pedestrian shelters and bikeways an integral part of the circulation pattern within and between communities to enhance safe interactions between motor vehicles and pedestrians and bicyclists, using techniques such as:

- *Renovating arterials and major collectors with bike lanes and walkways and designing intersections to encourage bicycling and walking for commuting and local travel.*
- *Developing all transit centers near residential areas to be safely and expeditiously accessible to pedestrians and bicyclists.*

Current Policy:

In 1993, ODOT adopted the following policy to establish walkways and bikeways:

The Oregon Department of Transportation shall provide safe, accessible and convenient bicycle and pedestrian facilities in urban areas. The intent is to encourage walking and bicycling as a mode of transportation. All walkways shall meet or exceed the minimum requirements of the Americans with Disabilities Act (ADA).

1. *ODOT shall include the appropriate bikeways and walkways on modernization projects inside a UGB, except on controlled access freeways, as required by ORS 366.514. Bikeways and walkways are not required if one of these three exceptions is met:*
   a) *The establishment of bikeways and walkways is contrary to public safety;*
   b) *The cost of establishing bikeways and walkways is excessively disproportionate to the need or probable use; or*
   c) *Sparsity of population, other available ways or other factors indicate an absence of any need for bikeways and walkways.*

If one or more of these exceptions are met, and bikeways or walkways will not be included on a project, the design shall not preclude their construction in the future. The design of intersections and interchanges shall accommodate bicyclists and pedestrians in a manner that is both safe and convenient.

2. *On other projects, such as preservation, 3R (resurfacing, restoration and rehabilitation), operation or safety improvements, ODOT will consider the need for bikeways and walkways.*
3. *In the development of the State Transportation Improvement Program (STIP), ODOT will consider projects that upgrade the roadway with bikeways and walkways to provide continuity.*
4. *ODOT may require developers to provide adequate bikeways and walkways.*
5. *Funding:*
   a) *ODOT will negotiate with a local jurisdiction to share cost.*
   b) *In absence of an agreement, ODOT is obligated to provide bikeways and walkways when constructing, reconstructing or relocating a highway, as required by ORS 366.514.*
6. *Responsibility for maintenance of bikeways and walkways shall be covered in the agreement with local jurisdiction.*

Exceptions for non-inclusion of bikeways and walkways shall be approved by the Region Manager and the Technical Services Managing Engineer. The exceptions shall be documented by the Project Development Team or the Project Development Team Manager, with supporting data that indicates basis for decision.

5. IMPLEMENTATION

Implementation of the Oregon Bicycle and Pedestrian Plan is dependent upon the availability of funding. Adoption of the plan by the Oregon Transportation Commission does not guarantee adequate financial resources to carry out the projects. Nor can the Commission commit the financial resources of other agencies or public bodies.

A. IMPLEMENTING THE ACTIONS

A.1. ACTION 1

Provide bikeway and walkway systems that are integrated with other transportation systems.

A.1.a. Implementing Strategies 1A & 1B on Rural Highways

STRATEGY 1A. *Integrate bicycle and pedestrian facility needs into all planning, design, construction and maintenance activities of the Department of Transportation and local units of government.*

STRATEGY 1B*. Retrofit existing roadways with wide paved shoulders or bike lanes to accommodate bicyclists, and with sidewalks and safe crossings to accommodate pedestrians.*

Relevant Plans and Programs

ODOT establishes priorities for rural modernization projects based on:

- **Corridor Plans** – detailed studies of statewide transportation corridors, used to determine long-term needs and to ensure that resources are spent effectively. Deficiencies are identified and projects are rated and developed to make the needed improvements. Paved shoulders will accommodate bicycle travel.
- The **Oregon Coast Highway Corridor Master Plan** – which identifies the need for paved shoulders in rural sections. The Oregon Coast Bike Route is a popular bicycle touring route which follows the Oregon Coast Highway as a shoulder bikeway, except where it follows county roads or city streets that are more scenic and have lower traffic volumes than the highway. The route is signed and ODOT publishes a map.
- The **Access Oregon Highways (AOH) Program**, – which gives priority to designated routes of statewide importance. These routes will benefit touring cyclists as they are upgraded with paved shoulders.

Bicycle and Pedestrian Improvements

Bicycle and pedestrian needs on rural highways are met through modernization or preservation projects:

- **Modernization:** When a highway is constructed, reconstructed or relocated, ODOT includes paved shoulders according to adopted standards, which take into account traffic conditions. The recommended shoulder widths are usually more than enough to accommodate bicycle and pedestrian travel.
- **Preservation:** When roadway conditions do not warrant reconstruction, a preservation project is programmed to maintain the surface in usable condition. Other needed improvements are considered, including shoulder widening. Where warranted and feasible, ODOT strives to provide wider shoulders on preservation projects.

Bicycle and Pedestrian Improvement Priorities

Sections of rural highways that link schools, parks, residential areas and other trip generators to the nearest urban area will receive high consideration. Some sections may warrant a path for pedestrian use.

Special consideration will be given to rural highways near urban areas (where traffic volumes are relatively high) to facilitate bicycle commuting - wide shoulders will increase safety and encourage more riders. Recreational riders who start their ride from the city will also benefit from wider shoulders.

A.1.b. Implementing Strategies 1A & 1B on Urban Highways

Relevant Plans and Programs

ODOT establishes priorities for urban modernization projects based on:

- **Corridor Plans:** In urban areas, the process is coordinated with local jurisdictions and the results are incorporated into the area's Transportation System Plan.
- **Transportation System Plans:** ODOT cooperates with cities and counties in developing local Transportation System Plans, to provide a comprehensive network of walkways and bikeways throughout the planning area. ODOT will offer to retrofit its urban highways with bikeways, walkways and crossing opportunities, as needed, to provide access on and across state highways. Deficiencies will be identified and projects will be prioritized and developed to make the needed improvements.

URBAN BICYCLE AND PEDESTRIAN IMPROVEMENT METHODS

Urban bikeways and walkways will be provided:

1. **As part of road construction projects:** ODOT will incorporate needed bicycle and pedestrian facilities on construction, reconstruction and relocation projects, subject to the provisions of ORS 366.514. Facilities may be provided on local streets that provide a better alternative to the highway. Costs may be shared with local jurisdictions on a mutually agreed upon ratio.

2. **As part of preservation projects:** These projects will be evaluated for their potential for pedestrian and bicycle improvements. These include bringing sidewalks up to ADA standards, constructing missing segments of sidewalks or widening pavement to provide bike lanes. Costs may be shared with local jurisdictions on a mutually agreed upon ratio.

3. **By developers as part of the permit conditions:** ODOT may require developers to provide needed bicycle and pedestrian facilities when modifications are made to the road. Incidental projects such as utility work will also be viewed as opportunities to make improvements.

4. **With minor betterment projects:** ODOT will make improvements such as widening shoulders prior to overlays, constructing short sections of sidewalk and constructing curb cuts and ramps. Costs may be shared with local jurisdictions on a mutually agreed upon ratio.

5. **By restriping roads with bike lanes:** ODOT will coordinate with local jurisdictions to restripe urban highways with bike lanes after overlay projects, where feasible, or retrofit bike lanes through stripe removal and repainting.

6. **As stand-alone bikeway and/or walkway projects (within right-of-way):** ODOT, in cooperation with local jurisdictions, will develop projects to construct bikeways and walkways where critical sections are missing. The primary purpose is to provide bicycle and pedestrian facilities. These projects are not generally associated with other highway improvements, but other needs may also be considered. Costs may be shared with local jurisdictions on a mutually agreed upon ratio.

Note: the improvements are not numbered in order of preference or priority.

Table 1: Bikeway and walkway implementation strategies

A.1.c. Priorities for stand-alone bikeway or walkway projects:

ODOT will develop bikeways and walkways based upon adopted project ranking criteria (see Appendices G & H): Special consideration will be given to:

1. Urban highways that have nearly complete bikeway and/or walkway systems;
2. Sections of urban highways that have many potential trip generators (schools, residential and commercial areas, etc.);
3. Urban highways that serve as "Main Street" through a community;
4. Sections of urban highways that complete commuter corridors and link local bikeways and walkways;
5. Sections of urban highways that are on transit routes;
6. Spot problem areas with high bicycle or pedestrian crash rates or potential for crashes; and
7. Sections of urban highways that are difficult to cross.

Local streets that tie into urban highways will also be considered for cooperative projects.

Many sections fulfill several priorities; for example, a state highway may run the entire length of a community, connect to a local network and serve schools and a transit system.

Note: the priorities are not numbered in order of preference.

GUIDELINES FOR PROVIDING BIKEWAYS AND WALKWAYS ON ROUTES PARALLEL TO STATE HIGHWAYS

There are occasions when it is infeasible or impractical to provide bikeways and walkways on a state highway, or the state highway does not serve the mobility and access needs of bicyclists and pedestrians, such as on limited access expressways. The following guidelines should be used to determine if it is more appropriate to provide facilities on a parallel local street:

1. a. Conditions exist such that it is not economically or environmentally feasible to provide adequate bikeways and walkways on the state highway; or
   b. State highway does not provide adequate access to destination points within reasonable walking or bicycling distances; or
   c. Bikeways and walkways on the state highway would not be considered safe;
2. Parallel route must provide continuity and convenient access to facilities served by the state highway;
3. Costs to improve parallel route should be no greater than costs to improve the state highway; and
4. Proposed facilities on parallel route must meet state standards for bikeways and walkways.

The above criteria should be satisfied and considered along with other factors when considering parallel routes for the provision of bicycle and pedestrian facilities. ODOT and the appropriate local government agency or agencies should negotiate cooperative cost sharing based on usage and benefits to the local and state system.

Table 2: Guidelines for providing facilities on parallel routes

PERFORMANCE MEASURES FOR STRATEGIES 1A & 1B

To ensure that ODOT is meeting its goals, the Bicycle/Pedestrian Program tracks four measures related to Strategies 1A and 1B:

1. Projects that meet criteria for accommodating pedestrians and bicyclists

Background: To fulfill the requirements of ORS 366.514, ODOT is responsible for ensuring that all construction projects funded, administered or constructed by ODOT include walkways and bikeways, unless one of three exemptions is met (absence of any need, excessive costs, or contrary to public safety).
Baseline: In fiscal year 1993-1994, 97% of projects met these requirements.
Goal: 100% compliance by 1995.

2. Bikeway and walkway projects that meet adopted criteria

Background: Many stand-alone bikeway and walkway projects are funded, administered or constructed by ODOT. All projects should meet the selection criteria outlined in Appendix G and H.
Baseline: In fiscal year 1993-1994, about 80% of projects met adopted criteria.
Goal: 100% by 1995.

3. Miles of rural state highways suitable for bicycling

Background: Rural state highways that have shoulders of 4 feet or greater, or daily average traffic volumes of less than 1000 per day, are considered suitable for bicycling.
Baseline: 89% in 1994
Goal: Add appropriate shoulders to highways as they are constructed or reconstructed.

4. Miles of urban state highways that accommodate pedestrians and bicyclists

Background: Urban state highways should have shoulders or bike lanes for bicyclists, sidewalks and safe crossings for pedestrians.
Baseline: In 1994, 32% of urban highways had bike lanes or shoulders, 30% had sidewalks on both sides of the road.
Goal: By 2005, provide needed bike lanes and sidewalks on 80% of urban highways.
By 2015, provide needed bike lanes and sidewalks on 100% of urban highways.

Table 3: Bicycle and pedestrian performance measures

A.1.d. The Statewide Transportation Improvement Program (STIP)

After a need has been identified in a plan, major roadway improvements are considered for inclusion in the STIP. Cities, counties, local groups or citizens who have identified a bikeway or walkway need may submit a project proposal to the local ODOT Region Manager; the proposal will be evaluated and considered for inclusion in the STIP. Citizens may also participate in the form of oral or written statements in support of bikeway and walkway improvements. After evaluation, recommended projects are submitted to the Transportation Commission for adoption in the final STIP.

A.1.e. Implementing Strategy 1C

STRATEGY 1C. *Provide financial assistance through grants to local governments for bikeway and walkway projects on local streets.*

ODOT provides grants to local governments for their bikeway and walkway projects within road or street right-of-way. The grant process helps ensure that facilities are well-conceived and built to high standards. Approved projects require a local match.

ODOT ranks applications using the criteria outlined in Appendices G and H. Projects are rated favorably if an important corridor is served, existing elements of a system are linked, the potential usage is high, the cost is reasonable, the project removes a deterrent to bicycling or walking and high design standards are used.

A.2. ACTION 2

Create a safe, convenient, and attractive bicycling and walking environment.

A.2.a. Implementing Strategies 2A and 2B

STRATEGY 2A. *Adopt design standards that create safe and convenient facilities to encourage bicycling and walking.*

STRATEGY 2B. *Provide uniform signing and marking of all bikeways and walkways.*

These strategies are implemented through the design section of this Plan.

A.2.b. Implementing Strategy 2C

STRATEGY 2C. *Adopt maintenance practices to preserve bikeways and walkways in a smooth, clean and safe condition.*

ODOT maintains its existing bikeways and walkways; the costs may be shared with local jurisdictions on a mutually agreed upon ratio. Maintenance costs are a relatively small portion of bicycle and pedestrian expenditures, but will rise as more bikeways and walkways are built. Most bikeway maintenance is performed as part of regular highway maintenance, such as sweeping or repair of shoulders, and incur little additional cost. However, some maintenance activities require special attention or a separate trip to repair facilities.

Refer to Section 2, Part IV for ODOT maintenance recommendations.

A.3. ACTION 3

Encourage and promote bicycle and pedestrian safety education programs.

A.3.a. Implementing Strategy 3A

STRATEGY 3A. *Monitor and analyze bicyclist and pedestrian crash data to devise strategies to improve bicyclist and pedestrian safety.*

ODOT publishes a yearly "Bicycle/Motor Vehicle Crash Report." A summary of the results can be found in the Safety Section of this plan. ODOT will begin publishing a "Pedestrian/Motor Vehicle Crash Report."

A.3.b. Implementing Strategy 3B

STRATEGY 3B. *Publish bicycling and walking maps and guides that inform the public of bicycle and pedestrian facilities and services.*

ODOT publishes two bicycle maps of statewide interest: the "Oregon Bicycling Guide" and the "Oregon Coast Bike Route" map. Both are available from bike shops, chambers of commerce, tourism offices and ODOT.

The **Oregon Bicycling Guide** serves touring bicyclists. It describes state highways and major county roads with conditions that are important to cyclists: traffic volumes, the presence of paved shoulders, grades, campgrounds, etc.

The **Oregon Coast Bike Route** map covers the coast in greater detail, with added features such as insets for portions of the route off the main highway, an elevation profile and narrative descriptions.

ODOT also provides grants to cities and counties for publishing local maps. Cities publish color-coded maps that show existing bikeways and other roads suitable for bicycling. Counties publish color-coded maps that indicate the conditions of existing roadways for cycling; counties may enter into

agreements with other counties to develop regional maps. ODOT will also consider grants for local walking maps.

A.3.c. Implementing Strategies 3C & 3D

STRATEGY 3C. *Develop bicycling and walking safety education programs to improve skills and observance of traffic laws, and promote overall safety for bicyclists and pedestrians of all ages.*

STRATEGY 3D. *Develop safety education programs aimed at motor vehicle drivers to improve awareness of the needs and rights of bicyclists and pedestrians.*

The Safety Section of Part 2 presents information that can be used to develop safety programs. Implementation of statewide bicycle and pedestrian safety programs is through the Transportation Safety Action Plan. In 1996, ODOT published the *Oregon Bicyclist's Manual,* a pamphlet designed to encourage safe riding practices.

A.3.d. Implementing Strategy 3E

STRATEGY 3E. *Develop a promotional program and materials to encourage increased usage of bicycling and walking.*

To meet future transportation needs in a cost-effective manner, ODOT will develop strategies to promote increased use of walking, bicycling, mass transit, carpooling, telecommuting and other transportation options.

To implement OTP Action 4.H.5 *(establish a demonstration program to encourage alternatives to the use of the automobile),* the Transportation Commission recommended selecting a city and promoting bicycling and walking to determine if doubling of bicycling and walking rates is a realistic goal.

The Oregon Bicycle and Pedestrian Advisory Committee developed guidelines and recommended selecting two cities:

- One city with existing facilities, to test the effectiveness of promotional campaigns (estimated cost: $300,000-600,000); and
- One city with incomplete facilities, to test the effectiveness of providing bikeways and walkways (estimated cost: $10 million-$50 million, depending on size of city).

The Department will evaluate these proposals to determine if they are cost-effective ways to implement successful promotional campaigns.

"Bike-to-work" events attract new riders to bicycle commuting

B. FINANCIAL CONSIDERATIONS

B.1. COSTS

B.1.a. Costs for Rural Highways

The cost of providing paved shoulders as part of highways improvements is incorporated into the overall cost of a project, since shoulders are provided primarily for motor vehicle safety and to reduce long-term maintenance costs.

The cost of adding paved shoulders to an existing roadway ranges widely:

- Adding paved shoulders can cost as little as $50,000/mile (both sides) if there are already graded, stable shoulders in place, if there are no additional needs such as culvert extensions or ditch regrading, and if the project is built in conjunction with a preservation overlay (paving materials costs are lower when large quantities are purchased).
- Adding paved shoulders can cost over $300,000/mile (both sides) if the shoulders need grading, if a ditch must be relocated, if there are geological or environmental constraints, and if right-of-way must be purchased.

B.1.b. Costs for Urban Highways

The cost of bicycle and pedestrian facilities is accounted for in urban modernization projects. Examples include sidewalks, pedestrian signals, and the extra width required for bike lanes when these are over and beyond the standard shoulder width for the roadway.

The cost range is wider than with rural projects: right-of-way costs vary throughout the state, and adding curbs and sidewalks usually requires drainage system improvements, or installation of a drainage system where there is none.

Bike lane striping can cost as little as $2,000 per mile, but reconstructing a roadway requiring right-of-way and drainage improvements can cost as much as $2 million per mile.

B.1.c. Other Costs

Local Grant Programs

ODOT currently expends approximately $450,000 per year on local grants.

Maintenance Costs

ODOT spends approximately $120,000 per year maintaining the existing bicycle and pedestrian facilities on state highways. As facilities are added, and as frequency of maintenance increases, this cost will rise.

Administrative Costs

The ODOT Bicycle/Pedestrian Program is currently staffed by two full-time employees. Administrative costs of approximately $140,000 per year include the costs of:

- Salaries and benefits for 2 FTE's;
- Printing maps and publishing reports;
- Providing training and organizing conferences;
- Travel expenses for the Oregon Bicycle and Pedestrian Advisory Committee; and
- Office overhead.

The overall cost to retrofit the sections of urban highways needing sidewalks and/or bike lanes is estimated at between $120 and $150 million (1994 dollars); The breakdown for the 6 categories outlined in A.1.a are:

1. As part of construction projects: $60 million
2. As part of preservation projects: $10 million
3. By striping roads with bike lanes: $1 million
4. By developers: not available
5. With minor betterment projects: $10 million
6. As stand-alone bikeway or walkway projects: $60 million

Most of the costs are for sidewalks, which are more expensive to provide than bike lanes.

Table 4: Urban bikeway and walkway costs on state system

B.2. FUNDING SOURCES

Introduction

Although there are few funding sources specifically dedicated to providing bicycle and pedestrian facilities, most transportation funds may be used for bikeways and walkways. Walkways and bikeways can be constructed if sufficient funds are dedicated from all available sources; the few available special funding sources are generally insufficient.

ODOT will seek adequate funding for the provision of bicycle and pedestrian facilities, by combining state, federal and other available funding sources.

B.2.a. State Funding

The major source of funding for bikeways and walkways constructed by ODOT is the Highway Fund, as intended by ORS 366.514, which requires that reasonable amounts be expended, as necessary, to provide bikeways and walkways. ORS 366.514 requires ODOT and cities and counties to provide bikeways and walkways wherever a road, street or highway is being constructed, reconstructed or relocated. Highway funds may also be used to fund bicycle and pedestrian projects independently of other road construction, but within highway right-of-way.

The State Highway Fund is comprised of weight-mile taxes, fuel taxes, licensing and registration fees and truck load violations. Approximately 40% is disbursed to cities and counties for highway purposes. ODOT receives the remaining 60% for its highway purposes.

The use of these funds is limited by Article IX, Section 3a, of the Oregon Constitution, which restricts the use of the Highway Fund to highway purposes. Allowable uses include bicycle and pedestrian facilities within street, road and highway rights-of-way that are open to motor vehicle traffic. Highway Funds cannot be spent on paths in parks or anywhere else outside of a highway, road or street right-of-way, or for general bicycle safety education, bicycle law enforcement or promotional campaigns.

Highway Funds are expended for the following purposes:

- Construction and engineering costs of bicycle and pedestrian facilities within street, road and highway right-of-way, as well as auxiliary facilities such as signs, curb cuts, ramps and bicycle parking;
- Maintenance costs of bikeways and walkways within highway right-of-way;
- Bicycle and pedestrian grants to cities and counties;
- Developing bicycle and pedestrian plans;
- Publishing bicycle maps;
- Administrative costs of the Bicycle and Pedestrian Program office and staff; and
- Expenses incurred by the Bicycle and Pedestrian Advisory Committee.

B.2.b. Federal Funding

Several federal statutes address bicycle and pedestrian concerns or make funds available for their construction. 23 CFR 652.5 states: “The safe accommodation of pedestrians and bicyclists should be given full consideration during the development of federal-aid highway projects.”

23 USC, Section 109(n) prohibits “the severance or destruction of an existing major route for non-motorized transportation traffic and light motorcycles unless such project provides a reasonable alternative route or such a route exists.”

Federal-aid money is available for bicycle and pedestrian facilities as part of normal federal-aid highway construction projects and at the same financial match ratio as the other highway work. Bikeway and walkway projects independent of other construction projects, as well as non-construction projects related to safe bicycle use, can be funded with an 80 percent federal share as provided in 23 USC, Section 217. Section 217 also states that bikeway projects must be principally for transportation rather than recreation purposes.

ISTEA states that it is federal transportation policy to promote increased use of bicycling, to accommodate bicycle and pedestrian needs in designing transportation facilities for urban and suburban areas, and to increase pedestrian safety.

The following ISTEA funding sources may be used for bicycle and pedestrian purposes:

- Section 1007: the Surface Transportation Program (STP)
- Section 1006: the National Highway System (NHS)
- Section 2002: Highway Safety Programs
- Section 1024: Metropolitan Planning (planning for MPO's)
- Section 1025: Statewide Planning
- Section S25: Federal Transit Funding (for bicycle and pedestrian access to facilities and shelters).
- Section 402: Funding for Safety Programs

Table 5: Federal funding sources for bikeways and walkways

The two sections of ISTEA that specify independent bicycle and pedestrian projects as allowable expenditures are:

Enhancement Funds:

Section 1007 requires that 10% of STP funds be used for Transportation Enhancement Activities, including facilities for pedestrians and bicyclists and the preservation of abandoned railway lines, including the conversion and use for pedestrian or bicycle trails. Bikeways and walkways must serve a transportation purpose to be eligible for ISTEA enhancement funds.

Congestion Mitigation and Air Quality (CMAQ):

Section 1008 funds can be used in areas that are not in compliance with federal air quality standards. They may be used for constructing bikeways and walkways, as well as such facilities as bike racks, lockers and showers.

Both the enhancement and CMAQ programs require a local match.

Most other sections of the ISTEA allow bicycle and pedestrian facilities to be constructed using federal funds (see table 5).

B.2.c. Other Funding

Although State Highway Fund monies provide the basic funding source for bikeways and walkways, local jurisdictions may also provide revenues from local sources such as:

- General funds;
- Special bond levies;
- Transportation impact fees;
- System development charges;
- Local Improvement Districts (LID's);
- Charges to adjacent property owners; and
- HUD (Housing and Urban Development) - the Community Block Grant Program includes sidewalks among its eligible uses.

Cooperative projects have also been funded with utility districts or companies to jointly build paths or structures to accommodate utility lines and bicycle and pedestrian traffic.

If particular roadway conditions create an immediate hazard for bicycle and pedestrian travel, federal safety program funds can be used, including Hazard Elimination Program funds.