

ARKANSAS STATE BICYCLE AND PEDESTRIAN TRANSPORTATION PLAN

April, 1998

Developed Cooperatively by:

THE ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT

and

THE FEDERAL HIGHWAY ADMINISTRATION

ARKANSAS STATE BICYCLE AND PEDESTRIAN TRANSPORTATION PLAN

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ARKANSAS STATE BICYCLE AND PEDESTRIAN TRANSPORTATION PLAN

EXECUTIVE SUMMARY

Since passage of the federal Intermodal Surface Transportation Efficiency Act of 1991, bicycle and pedestrian transportation are receiving renewed emphasis throughout the country. In light of this the Arkansas State Highway and Transportation Department has produced this plan as an element of its Statewide Long-Range Intermodal Transportation Plan.

AHTD will take the lead in assisting interested communities in the development of safe, usable and appealing local bicycle and pedestrian transportation systems. Plans for these systems will be based on local needs and recommended facilities will be designed and constructed utilizing prevailing standards. AHTD will also work with the state's six Metropolitan Planning Organizations and other local officials to facilitate bicycle and pedestrian planning.

Bicycle Transportation Plan Recommendations

- ⇒ Develop a bicycle safety pamphlet to distribute at schools, bicycle rodeos, and points of bicycle purchase outlining state laws, common rules of the road, and safety techniques for cycling including the benefits of wearing helmets.
- ⇒ Gather bicycle facility design standards from other states and adapt them to serve as standards for the development of such facilities in Arkansas. Until such Arkansas specific standards are available, utilize existing AASHTO bikeway standards and the FHWA guidance, "*Selecting Roadway Design Treatments to Accommodate Bicycles.*"
- ⇒ Determine the suitability and feasibility of developing bicycle facilities for urban and rural road improvements and modifications in the state.
- ⇒ Appoint an internal AHTD task force to be responsible for developing a process by which local communities can propose state routes traversing their jurisdictions to be signed as bicycle routes and to develop a set of criteria by which other routes would be selected for inclusion on the statewide bicycle suitability map.

- ⇒ Identify improvements needed to bring routes selected for the bikeway system up to prevailing standards.
- ⇒ Conduct a statewide personal transportation survey to determine the existing amount of utilitarian and recreational cycling taking place and the potential for increasing the frequency of cycling trips.
- ⇒ Work with the Department of Parks and Tourism to develop a follow-up survey to determine a qualitative analysis of cyclists' experiences in Arkansas.

Pedestrian Transportation Plan Recommendations

- ⇒ Encourage local communities to conduct sidewalk inventories as elements of master street plans. Such inventories will identify gaps in existing pedestrian systems and allow communities to target areas for improvements.
- ⇒ Cooperate with local communities to develop sidewalks in conjunction with urban highway and street improvements.
- ⇒ Replace substandard existing pedestrian facilities in conjunction with improvement projects and construct initial pedestrian facilities if local demand exists.
- ⇒ Develop a pedestrian safety program targeting school-aged children.

ARKANSAS STATE BICYCLE AND PEDESTRIAN TRANSPORTATION PLAN

The intent of this plan is to provide direction for planning, development, and implementation of safe and usable facilities for bicycle and pedestrian transportation in Arkansas. The goal of this plan is to establish a framework by which bicycling and walking are considered during the transportation planning process and to provide a safer environment for those modes of transportation. The success of this effort will be measured by quantifying personal trips using these modes of transportation, developing strategies to encourage and increase the numbers of these trips, and by reducing the known number of injuries and fatalities to individuals using these modes of transportation.

PLANNING

STATEWIDE BICYCLE AND PEDESTRIAN TRANSPORTATION PLANNING

The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) requires each state to develop a statewide transportation plan which will be implemented through a statewide transportation program. These plans and programs will provide for the development of transportation facilities which will function as an intermodal transportation system for the state. All forms of transportation including highways, rail, transit, air, and water are to be addressed. Recognizing their value to this system, bicycle and pedestrian transportation planning is required. This Plan comprises an element of Arkansas' long-range transportation plan.

REGIONAL BICYCLE AND PEDESTRIAN TRANSPORTATION PLANNING

Regional transportation planning for urbanized areas with populations over 50,000 is conducted by metropolitan planning organizations (MPOs) in coordination with AHTD. Sections 1024 and 1033 of ISTEA call for this planning to be incorporated into the MPOs' long-range transportation plan. Pedestrian walkways and bicycle transportation facilities are two of the modes to be addressed as part of the regional intermodal transportation system. Furthermore, the connectivity of one mode of travel to another and between communities within the MPO must be addressed. There are six MPOs in the state:

Bi-State Area Transportation Study, includes parts of Crawford and Sebastian Counties, in Arkansas, and parts of LeFlore and Sequoyah Counties in Oklahoma,

Central Arkansas Regional Transportation Study, encompassing parts of Faulkner, Lonoke, Pulaski, and Saline Counties,

Northwest Arkansas Regional Transportation Study, encompassing parts of Benton and Washington Counties,

Pine Bluff Area Transportation Study, part of Jefferson County,

Texarkana Urban Transportation Study, includes part of Miller County, in Arkansas, and Bowie County, in Texas, and

West Memphis Area Transportation Study, part of Crittenden County.

Transportation planning for non-urbanized, rural areas is conducted by AHTD. At times, Arkansas' eight Planning/Economic Development Districts assist in this process. A work element has been designed by AHTD to encourage and fund the identification of rural bicycle routes by these districts. Five of the eight districts have identified routes based on this work element.

FUNDING

FEDERAL FUND SOURCES

ISTEA contains provisions for funding bicycle and pedestrian facilities from several different sources. The section numbers included in the following descriptions refer to the section within ISTEA that outlines the funding and the amended section in the United States Code.

National Highway System (NHS) Funds (ISTEA Section 1006: Title 23 USC, Sec. 103) may be used to construct bicycle and pedestrian transportation facilities on lands adjacent to any highway on the National Highway System other than interstate routes. These facilities must be primarily for transportation rather than for recreation. For bicycle and pedestrian facilities developed with these funds by the state or by a community within an MPO, the projects must be contained in the long-range transportation plan of the respective authority. Projects to be developed on routes in communities not part of an MPO must be contained in a bicycle and/or pedestrian plan formulated specifically for that community. These funds must be matched at the rate of 20% state or local to 80% federal.

There are over 2,700 miles of highways in Arkansas proposed for the NHS; 2,162 are eligible for this funding.

Surface Transportation Program (STP) Funds (ISTEA Section 1007: Title 23 USC, Sec. 133) may be used for either the construction of bicycle and pedestrian transportation facilities or for nonconstruction projects such as brochures and maps related to bicycle safety. Again, bicycle facilities funded through this source must be primarily for transportation rather than recreation. For bicycle and

pedestrian facilities developed with these funds by the state or by a community within an MPO, the projects must be contained in the long-range transportation plan of the respective authority. Projects to be developed on routes in communities not part of an MPO must be contained in a bicycle and/or pedestrian plan formulated specifically for that community. These funds must be matched at the rate of 20% state or local to 80% federal.

Ten percent of Arkansas' annual STP funds must be set aside for transportation enhancement activities. Bicycle and pedestrian facilities are eligible under two of the ten transportation enhancement categories contained in this section of ISTEA: "provision of facilities for pedestrians and bicycles" and "preservation of abandoned railway corridors (including the conversion and use thereof for pedestrian or bicycle trails)."

AHTD has created a program through which city and county governments and state agencies can apply and compete for funds for the development of these projects. In 1993, the Arkansas Transportation Enhancement Program (ATEP) received 66 applications for this funding. Funding was approved for 36 bicycle and/or pedestrian facility projects totaling over \$4.9 million. These projects represented over 68% of all ATEP funding requested that year. In the 1994 cycle of the ATEP program, bicycle and/or pedestrian projects accounted for 24 of the 48 applications recommended for funding, representing over \$5.1 million in funding.

Congestion Mitigation and Air Quality Improvement Program Funds (ISTEA Section 1008: Title 23 USC, Sec. 149) may be used for either the construction of bicycle and pedestrian transportation facilities or for nonconstruction projects such as brochures and maps related to bicycle safety. Bicycle facilities funded through this source must be primarily for transportation rather than recreation. For bicycle and pedestrian facilities developed with these funds by the state or by a community within an MPO, the projects must be contained in the long-range transportation plan of the respective authority. Projects to be developed on routes in communities not part of an MPO must be contained in a bicycle and/or pedestrian plan formulated specifically for that community. These funds must be matched at the rate of 20% state or local to 80% federal.

Since all areas in Arkansas are in attainment of federal Clean Air Act standards, ISTEA provides that these funds may be used for STP projects including bicycle and pedestrian projects.

Federal Lands Highway Funds (ISTEA Section 1032: Title 23 USC, Sec. 204) may be used for the construction of bicycle and pedestrian transportation facilities on roads, highways, and parkways passing through federally owned and managed lands. Bicycle facilities funded through this source must be primarily for transportation rather than recreation. For bicycle and pedestrian facilities

developed with these funds by the state or by a community within an MPO, the projects must be contained in the long-range transportation plan of the respective authority. Projects to be developed on routes in communities not part of an MPO must be contained in a bicycle and/or pedestrian plan formulated specifically for that community. These funds require no state or local match: qualifying projects are 100% federally funded.

Scenic Byway Program Funds (ISTEA Section 1047) may be used for the construction of bicycle and pedestrian transportation facilities on roads classified as scenic byways. These funds must be matched at the rate of 20% state or local to 80% federal.

National Recreational Trails Fund (ISTEA Section 1302) monies may be used for the development of a wide variety of recreational trails benefiting cyclists, pedestrians, other nonmotorized trail users, and motorized trail users. Projects qualifying for these funds must be in compliance with trail recommendations contained in the Arkansas Statewide Comprehensive Outdoor Recreation Plan. States are required to spend 30% of these funds on motorized trail projects, 30% on nonmotorized trail projects, and the remaining 40% on multiple use trail projects. These funds require no state or local match: qualifying projects are 100% federally funded until 1994 when provisions in ISTEA will require a state match.

AHTD has cooperated with the Arkansas Department of Parks and Tourism and trail user groups to recommend funding four diversified trail use projects totaling \$48,805, two motorized trail projects totaling \$36,602, 11 non-motorized trail projects totaling \$36,602, and one environmental education/safety project for \$6,420 to develop a funding program to make these funds available for trail development and maintenance in the state.

Safety Program Funding (Title II, Section 2002; Title 23 USC, Sec. 402) can fund the development of bicycle and pedestrian safety programs aimed toward reducing the number of deaths or injuries brought about by traffic accidents. These funds require no state or local match: qualifying projects may be 100% federally funded.

Federal Transit Funding (ISTEA, Title III, Section 3025; Title 49 USC, Sec. 8, an amendment to the Urban Mass Transit Act of 1964) can be used to provide bicycle and pedestrian access to transit facilities, construction of shelters and bicycle parking facilities, and the installation of racks or other equipment for transporting bicycles on transit vehicles. These funds must be matched at the rate of 10% state or local to 90% federal.

Land and Water Conservation Fund (Public Law 88-578, as amended, not part of ISTEA) is a source of funding administered by the U.S. Department of the Interior, National Park Service and the Arkansas Department of Parks and

Tourism. This source can fund the development of bicycle and pedestrian facilities for outdoor recreation purposes. These funds must be matched at the rate of 50% state or local to 50% federal.

STATE FUND SOURCES

State Highway and Transportation Funds generated primarily through the collection of a state gasoline tax, are used by AHTD to match many of the ISTEA funding programs outlined above.

Arkansas Natural and Cultural Resources Grant and Trust Funds can be used to develop bicycle and pedestrian facilities for outdoor recreation purposes. These funds are available through a grant program administered by the Arkansas Department of Parks and Tourism. These funds must be matched at the rate of 50% state to 50% applicant.

Several states have developed programs to fund bicycle and pedestrian facilities using dedicated state revenues.

Michigan and Oregon dedicate 1% of state transportation funds for bicycle projects.

Washington earmarks 0.3% of state fuel tax revenues toward pathway (bicycle and pedestrian) development.

North Carolina and Minnesota spend a minimum of \$2 million each year on bicycle projects.

Iowa has a statewide trails program; \$1 million per year is funded through their road use tax fund. This program funds all types of trail development.

LOCAL FUND SOURCES

Community and county governments can use locally generated funding to develop bicycle and pedestrian facilities and to match the federal and state funding programs outlined above. These funds can be obtained from several sources depending on the size of a community and the willingness of its residents to pay for these facilities. Utilization of general revenues collected through property or sales taxes are the most common methods of generating these revenues.

Special taxes generated from lodging, dining, and amusement receipts and bond issue passage are also sources of local funding. Both of these require passage of ballot issues.

Several communities outside Arkansas are maintaining and expanding existing urban multi-use trail systems by requiring users to pay a small fee, usually \$10.00 or less for a permit. These programs have proven successful if established after trail systems are in place. However, potential users may be reluctant to pay such a fee if a trail system is not in existence prior to the purchase of the permit.

The appraised value of real estate donated to a government agency for the expressed purpose of a specific project can sometimes be used as all or part of the local match requirement for many of the fund sources mentioned previously. Individuals hoping to use this value as part of their match should first contact the administrator of the funding program.

BICYCLE TRANSPORTATION PLAN

The bicycle holds an important place in the development of our existing transportation system. The first roads in this country were paved as a result of early cyclists lobbying for improved all-weather road surfaces. Orville and Wilbur Wright, pioneers of American aviation, were bicycle builders. As the technology to manufacture internal combustion engines developed and improved, more and more Americans could afford automobiles. This accessibility relegated the bicycle to a less prominent position in American transportation. Many cycling advocates look to ISTEA for the resurgence of the bicycle as an integral element of our transportation system.

ARKANSAS BICYCLE FACILITY HISTORY AND LEGISLATION

Bicycling, as a form of transportation, is not new to Arkansas. Although typically viewed as a recreational activity many individuals are beginning to ride bicycles for more utilitarian purposes. Compared to the price of an operable used automobile, bicycles offer a much more affordable mode of transportation.

Exact numbers of Arkansas cyclists and their purposes for bicycling are not known, although evidence of the need for bicycle routes is apparent. In 1993, 19 applications were approved for federal funding through the Arkansas Transportation Enhancement Program to develop local bicycle systems or multi-purpose trails accessible to bikes. During the 1994 cycle of this program 11 applications for bicycle projects were approved.

A statewide random telephone survey conducted by the Arkansas Department of Parks and Tourism in 1985 indicates 59% of respondents owned bicycles. Of those respondents using trails within the previous year, 38% indicated they rode bicycles for an average of over 25 trips and that 89% of these individuals were not using designated trails. More needs to be known of Arkansans' personal travel characteristics and needs.

Arkansas Statutes Governing Bicycling

As early as 1937 Arkansas' Legislature recognized the need to develop statutes pertaining to the use of bicycles on our roads.

There are two sub-sections within Title 27 of Arkansas' Code dealing with bicycle law. The first, 27-36-220, mandates,

- "(a) Every bicycle shall be equipped with a lamp on the front exhibiting a white light visible from a distance of at least five hundred feet (500') to the front and with a lamp on the rear exhibiting a red light visible from a distance of five hundred feet (500') to the rear.

"(b) A red reflector meeting the requirements of Section 27-36-215 may be used in lieu of a rear light.

The second sub-section, 27-49-111, states,

"Every person riding a bicycle or an animal, or driving any animal drawing a vehicle upon a highway, shall have all the rights and all of the duties applicable to the driver of a vehicle, except those provisions of this subtitle which by their nature can have no applicability.

This sub-section implies cyclists have the same rights and responsibilities as drivers of motor vehicles and are therefore subject to the same laws and ordinances.

Arkansas community ordinances regarding bicycle use are most often tied to the previously mentioned state statutes. A few communities prohibit bicycling on sidewalks.

Arkansas Highway Commission minute order 64-144 states, "... the use of controlled access State Highways in the state by parades, pedestrians, bicycles and other nonmotorized traffic shall be prohibited." This is in line with Section 11-313, "Restrictions On The Use Of Controlled Access Roadway," of the Uniform Vehicle Code. This restriction has proven to be a detriment to some cross country cyclists riding across Arkansas as they approach the Mississippi River. Both of the bridges crossing this river between Memphis, Tennessee, and West Memphis, Arkansas, are on the interstate highway system and as such are controlled access routes. The only Arkansas bridges across the Mississippi River that can be ridden across by cyclists are U.S. 49 at Helena or U.S. 82 near Lake Village. The next bicycle crossing north of West Memphis/Memphis is U.S. 60/62 from southeast Missouri to Cairo, Illinois, and then across the Ohio river to Wickliffe, Kentucky.

The Arkansas Bikeways Commission

The Arkansas Bikeways Commission was formed in the early 1970s in an effort to develop a proactive statewide cycling atmosphere. The Commission's membership included interested cyclists, representatives of AHTD, the Arkansas Department of Parks and Tourism, and the Arkansas Chapter of the League of American Wheelmen. This group concentrated their efforts on developing the Arkansas State Bike Tours Map and bicycle safety educational materials.

The map, published in 1974, depicted 22 routes varying in length from an 11 mile tour through Pea Ridge National Military Park to a 500 mile, week long trip through the Ozark Mountains. The routes were rated easy, moderate, and difficult and were well distributed throughout the state. Also included were a list of bicycle dealers and repair shops, weather information, state and national parks, forest recreation areas, safety tips, and other useful information for cyclists.

Once the map and safety information were produced and distributed, interest in the Commission waned. No single state agency was targeted to house the Commission or its duties, and no funding was available to support its programs.

The Federal Highway Administration Bicycle Grant Program

The Federal Highway Administration Bicycle Grant Program was established by Section 141(c) of The Surface Transportation Assistance Act of 1978. The program was administered by AHTD. Through it, federal funding was made available for projects which would promote the use of bicycles for transportation and enhance access, mobility, or safety for bicyclists. These funds were available on a matching basis, with 75% coming from the FHWA and 25% coming from the project's local sponsor.

Three communities in Arkansas, Fayetteville, Ozark, and Pine Bluff, developed bicycle facilities in the early 1980s using a combined \$57,890 from this source. Their developments included independent bike paths, shared bicycle/motor vehicle lanes, bike rack installation, signing, striping, mapping, and the production and distribution of bicycle safety educational materials.

Many of the facilities developed with these funds are still in use today. However, when the original appropriation was expended, no additional funding was forthcoming from Congress.

The Arkansas Department of Parks and Tourism

The Arkansas Department of Parks and Tourism (ADPT) has long recognized the potential benefit of cycling to Arkansas' valuable tourism industry. ADPT estimates tourism contributed \$2.7 billion to our state's economy in 1992; an additional \$127 million in state taxes were generated as a result. Tourism is justifiably important to Arkansas' economy. Each of Arkansas' six natural divisions, the Ozark Mountains, the Arkansas River Valley, the Ouachita Mountains, the Coastal Plain, the Delta, and Crowley's Ridge, have great potential to draw cycling tourists to the state. The variety of terrain, recreational areas, and natural beauty make Arkansas an ideal location for cycling tours and vacations.

Two private individuals have begun organizing cycling tours in Arkansas. One, located in Harrison, runs a six day tour every June in the Ozark Mountains. The other, located in Camden, offers tours on an as-arranged basis.

The State Trails Coordinator, a position within ADPT, has developed a packet of information specifically for cyclists. The packet contains a state highway map, a description of 18 bicycle trips ranging in length from 21 to 95 miles, a description of a 500 mile trip through the Ozark and Ouachita mountains, a description of a cross-state route from West Memphis to Fort Smith, a description of typical seasonal weather patterns, an Arkansas Campers Guide, an Arkansas State Parks Guide, an Arkansas Bed and Breakfast Guide, and a listing of resources for other information and maps.

In 1990, the State Trails Coordinator mailed 135 of these packets to individuals requesting Arkansas bicycling information. In 1993, 498 were mailed (an increase of 269% in a three year period) to individuals and groups in 37 states, Canada, Mexico, and the Czech Republic. The vast majority of domestic requests came from Texas and other surrounding states. Also, states such as Wisconsin, Iowa, California, and others with well developed statewide cycling systems are generating a large number of these requests.

Although the cycling packet has been well received by individuals requesting this information, no qualitative analysis is available to indicate the quality of the riders' experience in Arkansas. Such information would be helpful when highway improvements are planned to ensure improvements are bicycle friendly. Furthermore, this would help provide AHTD a basis for justifying improvements to routes experiencing higher numbers of riders.

The 1986 Arkansas Statewide Trails Plan, published by ADPT, contained 35 objectives and recommendations relating to trail activities in the state. Five of these are directly related to bicycling. Briefly, they are as follows.

1. Encourage metropolitan areas to plan for increasing numbers of adults and children using bicycles.
2. Ensure that our highways are safe for cyclists.
3. Develop management plans to address off-road bicycling.
4. Identify primary routes for cyclists to enjoy our scenery and attractions.
5. Encourage cooperation among all levels of government, manufacturers, and suppliers to educate motorists and cyclists about mutual road safety.

Until the passage of ISTEA no concerted effort has been made to implement these recommendations, other than identifying routes for cyclists. However, the lack of implementation and the years between the 1986 Trails Plan and ISTEA have not diminished the relevance of these recommendations.

WHO ARE ARKANSAS' BICYCLISTS?

The 1990 National Personal Transportation Survey (NPTS) points out 0.7% of all personal travel trips are made by bicycle; this equates to seven out of every 1,000 trips made. The Survey indicates 39.6% of all travel trips are for a distance of two miles or less. Trips of these distance are easily accommodated via bicycle as is proven in the Survey. The NPTS indicates the average length of a bicycle trip in non-urbanized areas is 2.45 miles. Clearly, the potential for increasing the number of personal travel trips made by bicycle is great.

Of all bicycle trips documented in the NPTS, 55% were for commuting to work or school, personal or family business, or trips to church or civic functions. Social or recreational trips make up the remaining 45%.

A statewide outdoor recreation survey conducted in 1984 by the Arkansas Department of Parks and Tourism indicated 24% of all respondents rode a bicycle during the twelve month period prior to the survey. A similar survey conducted in early 1994 indicated 39% of Arkansans rode a bicycle during the previous year; an increase of 63%. Although these numbers are useful, they do not make a differentiation between recreational trips and utilitarian trips. The National Sporting Goods Association estimates \$4,143,000 in sales was generated in Arkansas in 1988 through the sale of 10, 12, 15, and 18 speed bicycles. This figure does not include the value of the sales of single speed bicycles or a wide variety of cycling accessories or clothing.

Bicycling is not an exclusively urban or exclusively rural mode of transportation. There is a need to provide safe and functional bicycle facilities in both areas of the state. According to the 1990 census, Arkansas' population was 51% urban (communities with populations over 2,500) and 49% rural.

In rural areas, schools, commercial districts, places of employment, and residential areas are commonly located adjacent to state highways. These are both destinations and generators of personal travel trips. Furthermore, these areas of the state, and the recreational, cultural, and scenic resources available in them, are popular with the growing number of visitors to Arkansas seeking areas for bicycle touring vacations. Planning for improvements and modifications to these routes should include a determination of the suitability and feasibility of developing bicycle facilities.

Between 1940 and 1990 the urban population in Arkansas rose over 173%; this trend is expected to continue into the future although the rate of growth is expected to slow. As urban populations grow, so does the potential for traffic congestion and air quality problems brought about by large numbers of vehicles traveling within and through these areas. One method of alleviating some of these potential problems is by providing bicycle transportation facilities and encouraging their use.

Our urban communities with colleges and universities are natural opportunities for the construction of bicycle facilities. Providing bicycle facilities in these communities could help

alleviate traffic congestion and parking problems often associated with campus areas. There are 11 communities in Arkansas with state or private colleges or universities.

Large urban areas can provide obstacles to cyclists. Controlled access routes, high vehicle counts, high speeds, and often narrow travel lanes combine to render these areas difficult for cyclists to traverse. These factors pose problems to local cyclists as well as touring cyclists traveling cross-country. Local transportation planners must be aware of local and regional cyclists' needs when planning improvements.

There are four primary classes of bicycle user. Depending on the purpose for riding a bicycle on any given occasion, an individual cyclist could fall into any of these categories.

Commuting/utility riders are those who ride to and from a specific destination. These cyclists want to use the shortest, quickest route possible to either transport goods and services or to travel to and from work or school. They ride for many reasons such as economics, ease of travel and parking, environmental beliefs, and pleasure. These cyclists are most likely to use a well planned bicycle transportation system.

Recreational cyclists are those who ride for exercise or enjoyment or take day long local excursions. For these cyclists, a short, direct route is less important than the ride itself. The recent increase in mountain biking is a direct reflection of the popularity of recreational cycling.

Touring is a form of recreational cycling, but at a more advanced level. These cyclists are riding greater distances and are participating in multi-day rides. Many recreational cyclists move on to touring as their skill and confidence levels increase.

Racing is an extremely specialized form of cycling. These cyclists carry out rigorous training regimens and participate in organized, often regionally and nationally sanctioned, races. They represent a small minority within the overall cycling user group.

Within each of these broad user groups, individual cyclists can be further divided into categories based on skill and confidence levels. Bicycle facility designers must take these differences into consideration. For example, bicycle facilities designed for grade school children would be different than those designed for college students; young children have shorter attention spans and are less likely to be familiar with common "rules of the road." A novice adult touring cyclist may feel comfortable riding only on routes with four foot wide, paved shoulders, whereas an experienced touring cyclist may be comfortable on routes with no shoulders at all. The identification of the primary and secondary users of a proposed bicycle project is an important element of the planning and design phases of bicycle facility development.

Bicyclist Injuries and Fatalities

Injury and fatality statistics for bicycling accidents on state highways are collected by AHTD. The following table indicates the numbers of deaths and injuries of cyclists on the state highway system for 1987 through 1992.

BICYCLIST DEATHS AND INJURIES 1987-1992

YEAR	DEATHS	INJURIES
1987	5	288
1988	5	228
1989	13	202
1990	2	214
1991	7	215
1992	4	200

The statistics further break down the data by age, whether the accident occurred during night or daytime hours, and whether in urban or rural locations. Comparing the frequencies of accidents leaves us with several general statements

1. Injuries occur most often in urban areas.
2. Fatalities are evenly distributed between rural and urban areas.
3. Males, between the ages of 5 and 19, account for the majority of injuries. These accidents take place during the day.
4. Males account for the clear majority of fatalities with even distribution between the age groups and time of accident.

Bicycle safety campaigns targeting these groups, particularly grade school children, may have the beneficial result of decreasing the frequencies of these accidents.

BICYCLE FACILITIES

Bicycle facilities are any structure, device, or improvement designed to encourage bicycle transportation including parking facilities, bike routes, safety education materials or programs, signage, traffic signal activation loops, maps, grade crossings, and others. Throughout this plan the phrase "bicycle facility" may be used to indicate any one or a combination of these elements.

Bicycle routes can be divided into three main categories based on the degree to which they are dedicated to the cyclists.

Bicycle Path or Multiple Purpose Path

This is a facility dedicated entirely to non-motorized traffic. These routes often allow use by pedestrians. If this is to be done, the facility must be designed with adequate width for two-way bicycle traffic and pedestrians. These routes are physically separated from motor vehicle lanes by some type of barrier, either a wide landscaped strip or some type of wall or fence. They may or may not be adjacent to existing motor vehicle routes.

When traffic counts are high and vehicle speeds are high along a selected corridor, this may be the best choice for a safe bike route. However, these facilities are costly to construct and maintain, and unless designed properly, may not serve the needs of the utilitarian cyclist. Furthermore, the use of multiple purpose paths can lull cyclists into a false sense of security when they are required to leave the path and use other routes they must share with motor vehicles. Many of these routes use the flood plain of streams and drainage ways for right-of-way and may serve a more recreational function.

Bicycle Lanes

These bike facilities, share the pavement surface and right-of-way with motor vehicles. A painted pavement stripe separates the bike lane from the motor vehicle lane. Painted bicycle lane pavement symbols and proper signing should also be used.

If existing road cross sections allow, bicycle lanes may be the most functional type of bicycle transportation facility. The existing road or street network is usually the most efficient form of transportation. In a few cases these facilities can be added to existing roads by simply restriping the pavement and providing signing. However, if this is determined to be best for a given situation, the lanes must be developed on both sides of the road. All cyclists must ride with the flow of vehicular traffic, not against that flow.

If bicycle lanes are constructed during an initial road construction project, they are extremely cost effective. If added during a widening or realignment project, the cost is still less than a retrofit project simply to add bike lanes.

Shared Lanes

These are bike routes which shares the road surface with motor vehicles. No physical separation exists between the bicyclist and motorist. No pavement markings are present. There should be signing along these routes to inform the motorist that bicycles may be present and to assure the cyclist that he/she is on an approved bicycle route.

These bike routes are most useful in areas where vehicle counts and speeds are relatively low. Also, these are the most cost effective routes because the only improvement necessary is some type of "share-the-road" signing.

Another type of shared lane is the wide curb lane. On a two, three, four, or five lane cross section, these are the outer lanes. These facilities are a minimum of 14 feet (4.2m) wide and are shared between cyclists and motor vehicles. When average daily traffic counts and average vehicle speeds are low enough, these facilities are adequate.

Shoulder Bicycle Facility

These are bicycle facilities using the paved shoulders of a roadway primarily in rural areas. No pavement markings are used. Signing of these facilities is typically done on a case by case basis depending on lane constrictions such as bridges, areas where the vertical or horizontal alignment reduces sight distance, or other sites which could pose a threat to the safety of a cyclist.

The width of a shoulder bicycle facility is determined by the route's average daily traffic volume and the average motor vehicle speed.

A mix of these bicycle facilities belongs in any successful bicycle transportation system. A typical bicycle commute could easily use all four types of routes. The Federal Highway Administration released guidance in January of 1994 entitled "*Selecting Roadway Design Treatments to Accommodate Bicycles.*" Tables in this guide use average annual daily traffic volumes and average motor vehicle operating speeds to determine the width of a given bicycle route and whether it should be a wide curb lane, paved shoulder, shared lane, or bike lane. These tables are oriented toward advanced cyclists as well as for beginner/children cyclists. Detailed planning will determine what the exact mix will be and which individual type of facility will be best suited for any particular corridor.

As mentioned earlier, bicycle safety education materials, parking racks, signal activation loops, and maps, all fall under the "bicycle facility" umbrella. A proper mix of all these elements will provide a safe, useful bicycle transportation system.

Bicycle Facility Design

In order for Arkansas to have a truly cohesive statewide system of bike routes, all bicycle facilities should be designed and constructed using the same guidelines and standards. This should include facilities developed for neighborhoods and communities, as well as facilities of regional or statewide scope. Using specific minimum standards, project planners and designers will retain the latitude to tailor a project to the unique needs of a community or location while remaining within the design parameters of other bicycle facilities in the state.

It must be noted, such standards are simply the minimum necessary to provide safe, usable facilities. Project designers are free to develop plans above the minimum standard. For example, an accepted minimum standard for the width of a bicycle lane on a street without parking or curbs is four feet. However, if space and funding are available, a five foot wide bikeway would be desirable. On the other hand, a three foot wide bikeway (below the minimum standard) on the same street would be unacceptable.

AHTD has adopted standards developed by the American Association of State Highway and Transportation Officials (AASHTO) for design and construction of roads and highways in the state. In August of 1991, AASHTO published a booklet of standards for bicycle facilities, "*Guide for the Development of Bicycle Facilities*," which contains guidelines for the planning, design, operation, and maintenance of these facilities.

The Federal Highway Administration released guidance in January, 1994 entitled, "*Selecting Roadway Design Treatments to Accommodate Bicycles*." Tables in this guide use average annual daily traffic volumes and average motor vehicle operating speed to determine the width of a given bicycle facility and whether the facility should be a wide curb lane, paved shoulder, shared lane, or a bicycle lane. The tables make a distinction between children or beginning cyclists and advanced cyclists.

Another guide for bicycle standards is the "*Manual on Uniform Traffic Control Devices*," developed by the U.S. Department of Transportation, Federal Highway Administration. Part IX of the Manual contains standards for signing, pavement markings, and signalization for bicycle facilities.

Planners and designers should be aware that these standards will not provide perfect answers to every bicycle facility problem that develops. New standards addressing and solving these problems will have to be formulated and adopted as the need arises.

Bicycle Route Selection

A statewide system of bicycle routes which will be useful to Arkansans who cycle as well as visitors who want to tour the state via bicycle is needed. Such a system linking major parks and recreation areas, scenic byways, colleges and universities, communities with populations over 10,000 and other points of interest will be developed. There are 149 individual sites meeting these criteria. Several communities contain more than one of these sites.

Major Federal Recreation Areas (U.S. Forest Service, National Park Service, and U.S. Army Corps of Engineers)	22
Scenic Byways (State and U.S. Forest Service)	8
Arkansas State Parks, Museums, and Historic Sites	49
Communities over 10,000 population	24
Colleges, Universities, and Vo-Techs	46

Routes linking these areas will be reviewed by an interdisciplinary task force of AHTD personnel representing the Programs and Contracts, Roadway Design, Environmental, and Planning and Research Divisions, and the districts. The selections will be based on factors such as the average annual daily traffic volumes, the average vehicle operating speed, the degree to which the route provides connections with destinations and other routes in the system, and the physical characteristics of the routes. Local bicycle clubs, regional tourism associations and other interested groups will be asked to assist in the route identification process and will also be encouraged to review the selected routes for cyclability.

Once routes are selected, needs such as paving shoulders, lane striping, bridge widening, and others will be identified. Individual sections of the system will be considered for improvement as funds and opportunities are presented. An example of such an opportunity would be a programmed project to overlay a portion of highway and pave its shoulders.

A map indicating bicycle routes and giving the locations of emergency assistance, bicycle repair shops, and other resources will be produced. Initially, the map will highlight the system and encourage experienced cyclists to utilize the routes. In the future, as improvements are made to the routes to improve their cyclability, less experienced riders will feel comfortable using the system. After the statewide bicycle route system is identified, and the map is available, Arkansas' twelve regional tourism promotion organizations and the Arkansas Department of Parks and Tourism can utilize existing procedures to promote Arkansas as a cycling destination.

Another duty of the task force will be to develop a mechanism by which community proposals for bike routes on state or U.S. highways can be reviewed. The task force will also maintain a file of community bicycle transportation plans to be used to ensure routes are properly upgraded

with bicycle facilities as funds and opportunities are made available. Bicycle facilities will be developed on these highways only if they are indicated as proposed bike routes in an approved bicycle transportation plan.

ELEMENTS OF A BALANCED BICYCLE PROGRAM

Simply designating bicycle facilities is not enough to provide cyclists with the environment needed for safe, efficient non-motorized transportation. A mix of four key elements needs to be present: engineering and planning, enforcement, education, and encouragement.

Engineering and Planning

For a bicycle transportation system to function properly, facilities must be well designed and placed where cyclists will use them. Bicycle lanes, shared lanes, shoulder bike facilities, bicycle parking equipment, railroad grade crossings, and other facilities should be designed based on existing design manuals and successful past experience. Designers need to recognize that solutions to many bicycle transportation design problems may involve innovative tactics.

Planning the system should involve cyclists familiar with the area who will eventually be using it on a regular basis. Successful bicycle transportation systems will vary greatly from community to community. There is no typical solution to the questions of, "Where should bike lanes be built instead of wide curb lanes?" or "How many bicycle parking slots should be provided at a given location?" Only detailed local planning can answer these and other questions that will arise.

As a mode of transportation, bicycle facilities should be an integral element of any community's master street plan. By planning for bicycle transportation facilities in conjunction with the expansion and improvement of the existing street network, communities can maximize their transportation budgets and ensure that all modes of transportation are considered.

Enforcement

The enforcement of traffic laws, zoning codes, and planning guidelines is another key element to a successful bicycle transportation system.

Cyclists, pedestrians, and motorists must all be required to follow existing law and "rules of the road." Law enforcement officers must be as willing to write a citation for a cyclist running a stop sign as they are to cite a motorist violating a posted speed limit. Both are violations of the law and both can easily lead to serious injury or death.

For communities with bicycle transportation elements in their master street plans that require the dedication of right-of-way for the development of bicycle facilities, enforcement of these ordinances must be maintained. Allowing one developer to forego this dedication could result in an irreparable gap in a community bicycle transportation system.

Similarly, once a community has developed its bicycle transportation plan and identified routes slated for improvement to allow cycling, the recommendations in the plan should be adhered to and implemented as funds become available.

Education

Education is another of the key elements of a successful bicycle transportation plan. Cyclists must know their rights and responsibilities when riding. Motorists need to know how to react when approaching and passing a cyclist.

Designers and planners have to assess the needs of cyclists when they consider the feasibility, location, and design of bicycle transportation facilities. Involving the public during the planning phase is a form of education. Also, designers and planners must keep abreast of new and innovative solutions to bicycle transportation problems.

Education is an important factor in improving bicycle safety. Cyclists of all ages have to be taught proper cycling techniques and the laws affecting them as they ride on public thoroughfares. Proper turn signals, procedures for crossing or turning at intersections, and other cycling skills need to be taught and mastered. In Arkansas, this function has fallen to volunteer groups. Local cycling clubs, Boy and Girl Scout units, and cycle mounted law enforcement personnel have made themselves available to teach safe cycling skills.

However, there is no formal or "packaged" program available to Arkansans seeking this knowledge. Such a standardized program would ensure that all participants are receiving the same information. Video tapes, posters, coloring books, and other cycling safety education materials are available from nationwide suppliers at relatively reasonable costs.

Chapter VII of the "Driver's License Manual," produced by the Arkansas State Police contains a page and a half of information entitled, "What Every Driver Should Know About Bicyclists." The information is directed toward motorists, but is just as useful for cyclists.

Encouragement

Once constructed, individuals need to be encouraged to use available bicycle transportation systems. "Build it and they will come," is true only to a limited extent regarding bicycle transportation systems. Individuals who are currently avid cyclists should automatically use the system once improvements have been implemented. Some individuals classified as potential cyclists will also use the system with little or no encouragement. However, for the vast majority of people, it will take a concerted effort to entice them out of motor vehicles and on to bicycles. These potential cyclists need to be reached so the benefits of using the system can be explained. Local media public service announcements, both print and air, can be used. Special events highlighting cycling and the bicycle transportation system can be planned and publicized.

Another form of encouragement is the availability of amenities serving the bicycle transportation system. Adequate bicycle parking facilities, showers at places of employment, system maps, and others can encourage use of the system.

The exact mix of these four elements will vary from community to community. Also, the categories are not totally exclusive. For example, a bicycle transportation system map may be a

form of encouragement but it also serves an educational function. Similarly, safety can be enhanced through proper design and construction, but may be improved more effectively through a program of bicycle safety education.

BICYCLE TRANSPORTATION PLAN RECOMMENDATIONS

- ⇒ Develop a bicycle safety pamphlet to distribute at schools, bicycle rodeos, and points of bicycle purchase outlining state laws, common rules of the road, and safety techniques for cycling including the benefits of wearing helmets.
- ⇒ Gather bicycle facility design standards from other states and adapt them to serve as standards for the development of such facilities in Arkansas. Until such Arkansas specific standards are available, utilize existing AASHTO bikeway standards and the FHWA guidance, "*Selecting Roadway Design Treatments to Accommodate Bicycles.*"
- ⇒ Determine the suitability and feasibility of developing bicycle facilities for urban and rural road improvements and modifications in the state.
- ⇒ Appoint an internal AHTD task force to be responsible for developing a process by which local communities can propose state routes traversing their jurisdictions to be signed as bicycle routes and to develop a set of criteria by which other routes would be selected for inclusion on the statewide bicycle suitability map.
- ⇒ Identify improvements needed to bring routes selected for the bikeway system up to prevailing standards.
- ⇒ Conduct a statewide personal transportation survey to determine the existing amount of utilitarian and recreational cycling taking place and the potential for increasing the frequency of cycling trips.
- ⇒ Work with the Department of Parks and Tourism to develop a follow-up survey to determine a qualitative analysis of cyclists' experiences in Arkansas.

PEDESTRIAN TRANSPORTATION PLAN

Pedestrian transportation, or walking, can easily be defined as man's first form of transportation. Early hunter-gatherers covered great distances on foot searching for food, water, and shelter; their progress was slow but effective. Today, walking is still a viable and important form of personal transportation. Each of us begins and ends nearly all personal travel trips as pedestrians. Many of us, either by choice or necessity, walk regularly to conduct personal business. Our children walk to school or to the bus stop. We walk to the grocery store. We walk from our parked car to the office door or the front door of our home.

ARKANSAS PEDESTRIAN LEGISLATION

An Arkansas State Statute enacted in 1937, 27-49-208 (b), defines a pedestrian as, "any person afoot."

Other statutes, also enacted in 1937, are dedicated to pedestrian law and contain the following sections:

- 27-51-1201 pedestrians are subject to traffic-control signals at intersections,
- 27-51-1202 drivers must yield to pedestrians within marked or unmarked crosswalks,
- 27-51-1203 pedestrians must cross within the right half of crosswalks,
- 27-51-1204 pedestrians crossing roads with no crosswalks must yield to motor vehicles, pedestrians must use elevated crosswalks or tunnels if available, pedestrians will not cross between marked crosswalks, and drivers of motor vehicles must exercise caution when approaching pedestrians who are not in marked crosswalks
- 27-51-1205 prohibits pedestrians from standing in the roadway when hitch-hiking, and
- 27-51-1406 motor vehicles or motor driven bicycles must give reasonable warning to pedestrians or animals when approaching them to avoid injuring or frightening them.

Many communities have amplified these state statutes by enacting local ordinances governing pedestrians and their movements along city streets. Two common examples are ordinances requiring pedestrians to walk on sidewalks when available and to walk facing traffic when sidewalks are not available.

Another form of local ordinance affecting pedestrians is an ordinance requiring residential developers to provide right-of-way for sidewalks and to construct them in conjunction with the streets.

WHO ARE THE PEDESTRIANS IN ARKANSAS?

As mentioned in the introduction to the pedestrian element of this plan, we are all pedestrians at times. Some individuals are pedestrians by choice; they elect to walk rather than use other forms of available transportation. Others walk because they can afford no other method of transportation. Individuals of all age groups, sexes, income groups, and educational levels walk. Urban and rural Arkansans walk.

The National Personal Transportation Survey (NPTS) conducted in 1990 points out 44.3% of all personal travel trips taken by households without automobiles are by walking; this is the number one form of transportation for individuals not owning automobiles. The Survey calculated the average distance individuals were willing to walk at 0.64 miles. People in large urban areas were willing to walk further, 0.77 miles, than those residing in smaller communities or in rural settings, 0.58 miles. The Survey also points out 13.7 % of all personal travel trips are of a distance less than 0.5 miles.

Of all walking trips documented in the NPTS, 65% were for commuting to work or school, personal or family business, or trips to church or civic functions. Social or recreational trips make up the remaining 35%.

A statewide outdoor recreation survey conducted in 1984 by the Arkansas Department of Parks and Tourism indicated 64% of all respondents walked for pleasure during the twelve month period prior to the survey. A similar survey conducted in early 1994 indicates 73% of Arkansans walked for pleasure during the previous year; an increase of 14% in ten years. The National Sporting Goods Association estimates \$6,809,000 in sales was generated in Arkansas in 1988 through the sale of walking shoes. Walking is an integral element of many forms of outdoor recreation.

Pedestrian Injuries and Fatalities

Injury and fatality statistics for pedestrian accidents on state highways are collected by AHTD. The following table indicates the numbers of deaths and injuries of pedestrians on the state highway system for 1987 through 1992.

PEDESTRIAN DEATHS AND INJURIES 1987-1992

YEAR	DEATHS	INJURIES
1987	56	551
1988	45	601
1989	49	573
1990	59	550
1991	51	599
1992	62	486

The statistics further break down the data by age, whether the accident occurred during night or daytime hours, and whether in urban or rural locations. Comparing the frequencies of accidents leaves us with several general statements

1. Injuries occur most often in urban areas.
2. Fatalities are evenly distributed between rural and urban areas.
3. Males age 25 and above account for the majority of fatalities. Most occur at night.
4. Males, between the ages of 5 and 14, account for the majority of injuries. Most take place during the day.

Pedestrian safety campaigns targeting these groups, particularly school children, may have the beneficial result of decreasing the frequencies of these accidents.

PEDESTRIAN FACILITIES

The typical pedestrian facility is a sidewalk adjacent to a city street. However, this is only one example of a pedestrian facility. Sidewalks, walkways, trails, crosswalks, refuge islands, signing, pavement markings, curb cuts, pedestrian traffic control devices, and others are all pedestrian facilities. Also, depending on the location of the walkway and its intended use, lighting, seating, and landscape plantings could qualify as pedestrian facilities.

Transportation planners need to determine which of these facilities are necessary for a given project. They must consider the ages of the targeted pedestrians, the degree of their mobility, the location of the walkway, the origins and destinations of its intended users, the speeds and amount of motor vehicle traffic, adjacent businesses or residences, and other factors during the planning and design phases.

Ranging from smooth hard surfaced sidewalks to rough backcountry foot paths, trails offer pedestrian access to unique natural areas, wilderness areas, and other natural and cultural resources. Such pedestrian facilities are valuable components of our outdoor recreation environment.

Pedestrian Facility Design Standards

The American Association of State Highway and Transportation Officials (AASHTO) has included design standards for pedestrian facilities in their "Policy on Geometric Design of Highways and Streets," also known as the "greenbook." Included are statistics concerning the average speed of pedestrians, the personal space required, comparisons of walking speeds and densities on walkways, and others.

The greenbook discusses levels-of-service (LOS) for sidewalks, stairs, and crosswalks. These are computations of the relative mobility of pedestrians and their conflicts with other pedestrians and obstacles that influence walking speed, maneuvering room, and feelings of comfort. Sidewalks for example, have six separate LOS. The lowest (best), LOS A, provides for 35 square feet of space per pedestrian. At this level the walker has plenty of room to maneuver and select a personal pace. The highest (worst), LOS F, provides less than five square feet per pedestrian. At this level pedestrians move as a mass and are relegated to shuffling their feet to move; they are often in direct physical contact with other pedestrians.

Also in the greenbook are sections devoted to pedestrian crossings including tunnels, crosswalks, and bridges, refuge islands, and curb cut ramps for individuals with mobility impairments. Barrier free standards must be adhered to during the design and construction phases of a pedestrian facility development. Individuals with mobility, visual, hearing, and mental impairments have special needs that must be planned for. Furthermore, areas with concentrations of individuals with these or other special needs should receive added attention during the planning and design phases.

A Federal Highway Administration publication, "Planning Design and Maintenance of Pedestrian Facilities," contains detailed discussions of pedestrians' physical characteristics, pedestrian safety studies, pedestrian traffic control devices, and other pertinent information.

Section 4D of the "*Manual of Uniform Traffic Control Devices*" (MUTCD) developed by the Federal Highway Administration contains pedestrian signal guidelines. Section 2B and 2C of the Manual contain regulatory signage for pedestrians. Traffic and pedestrian signaling for school areas is covered in Section 7 of the Manual.

ELEMENTS OF A BALANCED PEDESTRIAN PROGRAM

Simply constructing pedestrian facilities is not enough to provide pedestrians with the environment needed for safe, efficient pedestrian transportation. A mix of four elements must be present: engineering and planning, enforcement, education, and encouragement.

Engineering and Planning

Pedestrian facilities must be planned and designed properly in order to provide pedestrians with a safe, functional walking environment. This can be accomplished as an integral element of a new construction project or as an element of an improvement project. Early identification of the need to provide pedestrian facilities is the key to this process. The cost of developing pedestrian facilities as one part of a larger project is far less than the cost of developing these facilities as stand-alone projects.

The level of actual and potential pedestrian activity must be determined. This can be accomplished by origin and destination surveys or by physically counting the users. Generators of pedestrian traffic (schools, libraries, neighborhood parks, transit facilities, shopping areas, parking lots and garages, residential areas, etc.) must be identified during the planning process. Furthermore, the location of the facility may determine the type of use, which in turn will determine the physical parameters of the walkway and any necessary support facilities such as lighting, benches, and landscape plantings. A sidewalk developed in a residential area with tree-lined curvilinear streets and low vehicle speeds will be designed using standards different than a sidewalk in an urban shopping/office environment.

Barriers to walking, both physical and perceived, have to be identified and studied. Some barriers such as a lack of connections within existing sidewalk systems can be overcome during the planning and design phases of project development. Other barriers may have to be overcome through education or encouragement.

Design standards for barrier free access must be adhered to. Many of these standards are direct results of two pieces of federal legislation, the Architectural Barriers Act of 1968 (PL 90-480) and the Americans with Disabilities Act of 1990 (PL 101-336). Individuals with varying degrees of physical mobility have to be considered during the design process to ensure equal access is provided for all. This includes people with mobility impairments, sight impairments, and in some cases, hearing and mental impairments. Pedestrian facilities designed and constructed with these individuals in mind will be readily usable by those without disabilities.

Education

Users and potential users of pedestrian facilities have to be aware of the specific local regulations regarding walking and the benefits walking provides. This can be accomplished through programs targeting elementary education, public service announcements, or local and community events and rallies.

Planners and designers of pedestrian facilities must be cognizant of the special needs of pedestrians. People do not always walk using the same rules of the road they use as motor vehicle operators. Knowing this, and being able to anticipate possible pedestrian oriented problems, will help planners and designers provide usable, attractive pedestrian facilities. For example, college and university planners have decided it is best to construct sidewalks after the students have shown them where the facilities should be placed. The paths the students take are often the most direct and offer the least resistance to their destination.

Florida's Department of Transportation has developed a training course directed toward state and local transportation planners, landscape architects, developers, and others interested in providing pedestrian facilities. Using slides to illustrate typical pedestrian situations they show participants examples of good, usable facilities as well as examples of poorly designed, dangerous facilities.

Encouragement

Simply providing pedestrian facilities may not be enough to ensure their use. Many individuals will have to be encouraged to use the facilities. Some of this encouragement can be accomplished during the planning and design phases by providing adequate separation between the users and adjacent motor vehicle traffic or by providing lighting. Physically appealing facilities are more likely to be used than facilities designed with no consideration of their attractiveness.

Other types of encouragement might be provided through educational efforts explaining the benefits of walking, the availability of pedestrian facilities, and the costs involved with operating motor vehicles for short trips.

Enforcement

Many communities have local ordinances defining what can and cannot be done on sidewalks. An example is an ordinance prohibiting motor vehicles from parking on sidewalks. Obviously, if vehicles are using the sidewalks for parking, their utility as pedestrian transportation facilities is greatly diminished. A few communities have ordinances requiring developers to dedicate right-of-way and construct sidewalks in order to obtain the necessary permits and approvals.

As mentioned earlier, there is state legislation requiring individuals to use cross walks as opposed to crossing streets mid-block, or jay-walking. Although seldom enforced, crossing mid-block has the potential to be extremely dangerous to both pedestrians and motorists.

Each of these four elements - engineering and planning, education, encouragement, and enforcement - must be used in conjunction with each other to provide adequate pedestrian transportation facilities. A solution to a specific problem may rely heavily on one of the elements. However, all four must be considered during the problem solving process.

RECOMMENDED ATTRIBUTES OF A LOCAL PEDESTRIAN PLAN

In his book, "Pedestrian Planning and Design," John Fruin recommends six attributes of walkability. They are safety, security, convenience, continuity, system coherence, and comfort and attractiveness.

Safety

Sidewalks must be of adequate width to accommodate projected use and must be free of obstructions. Sidewalks have to be separated from adjacent motor vehicle lanes by either distance, landscape plantings, or by other means. Adequate crossing aids including signals and refuge islands have to be present. The walk phase of pedestrian signals must be long enough to allow individuals with mobility impairments to safely cross the street. These elements will help reduce the possibility of conflicts between pedestrians and motor vehicles.

Security

To provide users a sense of security against a possible criminal element, pedestrian facilities should be constructed in plain view of passers-by and law enforcement personnel. These facilities should be designed with no "hiding" places and adequate lighting should be installed. Lines of sight must be great enough so users can see ahead and avoid possible obstructions or threats to personal safety.

Convenience

Pedestrian facilities should provide users with linkages to other forms of transportation. Obstructions should be eliminated or minimized. An adequate number of well placed street crossings must be provided and pedestrian signal timing should allow ample time to cross without hurrying. Individuals with all types of physical impairments must be accommodated. If pedestrian volumes are high enough, certain streets should be closed to motor vehicle traffic for specific time periods during the day or for special events.

Continuity

All public facilities should be connected via the pedestrian transportation system as should residential areas, recreation areas, places of employment, shopping areas, and business areas.

System Coherence

Pedestrian facilities must be designed at human scale and must be integrated into the urban and suburban landscape. Walkways should follow logical routes and must be supported by adequate signing, signalization, and in certain cases, maps. The development and maintenance of pedestrian facilities should be as high a priority as other modes of transportation.

Comfort and Attractiveness

To encourage their use, pedestrian facilities should be aesthetically and physically pleasing; landscape plantings, surface texture, and rest areas can help accomplish this.

Combining the four elements of a balanced pedestrian program with the six attributes of walkability will provide a functioning, safe, usable pedestrian transportation system.

PEDESTRIAN TRANSPORTATION PLAN RECOMMENDATIONS

- ⇒ Encourage local communities to conduct sidewalk inventories as elements of master street plans. Such inventories will identify gaps in existing pedestrian systems and allow communities to target areas for improvements.
- ⇒ Cooperate with local communities to develop sidewalks in conjunction with urban highway and street improvements.
- ⇒ Replace substandard existing pedestrian facilities in conjunction with improvement projects and construct initial pedestrian facilities if local demand exists.
- ⇒ Develop a pedestrian safety program targeting school aged children.

REFERENCES

- American Association of State Highway and Transportation Officials, "Guide for the Development of Bicycle Facilities." Washington, D.C., August, 1991.
- American Association of State Highway and Transportation Officials, "Policy on Geometric Design of Highways and Streets." Washington, D.C., 1984.
- Arkansas Department of Parks and Tourism, "90 SCORP: Arkansas Statewide Comprehensive Outdoor Recreation Plan." Little Rock, December, 1991.
- Arkansas State Police, "Driver's License Manual." Little Rock.
- "Florida Conducts Effective Pedestrian Facilities Design Course." The Urban Transportation Monitor, Burke, Virginia. December 10, 1993
- Florida Department of Transportation, "Florida Pedestrian System Plan: Executive Summary". State Project No. 99000-1737, Tallahassee, 1989
- Levinson, Herbert. "Improving the Walking Environment," Part I and II. The Urban Transportation Monitor, Burke, Virginia. April 16 and 30, 1993.
- U.S. Department of Transportation, Federal Highway Administration, "The National Bicycling and Walking Study." Publication No. FHWA-PD-94-023, 1994.
- U.S. Department of Transportation, Federal Highway Administration, "1990 National Personal Transportation Survey Databook." Volumes 1 and 2. Publication No. FHWA-PL-95-010A.
- U.S. Department of Transportation, Federal Highway Administration, "Planning Design and Maintenance of Pedestrian Facilities." Publication No. FHWA-IP-88-0193, March, 1989.
- U.S. Department of Transportation, Federal Highway Administration, "Selecting Roadway Design Treatments to Accommodate Bicycles." Publication No. FHWA-RD-92-073, January, 1994.
- Venhaus, Monty, et. al. "SCORP Statewide Public Opinion Telephone Survey." Arkansas Institute of Government, University of Arkansas - Little Rock, under contract to the Arkansas Department of Parks and Tourism. Little Rock, February, 1994.
- Williams, John, et. al. "Balancing Engineering, Education, Law Enforcement, and Encouragement in Local Bicycle Programs." Case Study 11, National Bicycling and Walking Study, U.S. Department of Transportation, Federal Highway Administration, Publication No. FHWA-PD-93-009, 1993.