



Case Study No. 21

*Integrating
Bicycle and
Pedestrian
Considerations
Into State and
Local
Transportation
Planning,
Design, and
Operations*



U.S. Department
of Transportation
**Federal Highway
Administration**

National Bicycling And Walking Study



Foreword

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FHWA Case Study No. 21**

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and Local Transportation Planning,
Design, and Operations**

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Section 1. Executive Summary

1. Introduction

The process of integrating bicycle and pedestrian considerations into State and local transportation planning, design, and operations has become known as “institutionalization.”

Many of the essential elements of institutionalization have been explored in great detail by the other case studies commissioned as part of the National Bicycling and Walking Study. The study itself is an example of how institutionalization is taking place at the Federal Government level.

Institutionalization

While states such as Florida and cities such as Seattle, WA, have become almost synonymous with institutionalization at the State and local level, the Federal Government has been through a remarkable process of integrating bicycling and walking into its routine operations over the last 2 years.

The process started with a new national transportation policy statement and has included staff appointments, legislative changes, the National Bicycling and Walking Study, the development of a training program to educate traffic engineers and planners, and a succession of positive policy memoranda from the Federal Highway Administrator.

Elements of Integration

A number of key elements of integration are identifiable.

1. Bicycle and pedestrian program staff.

Full-time staff positions in the transportation/public works department are essential to a successful process of institutionalization.

2. Plans and policy documents.

The need for bicycle and pedestrian provisions to be fully integrated into State and local plans has assumed new significance since the passage of the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991. Funding of projects will depend upon their inclusion in State and metropolitan long- and short-range plans.

Pedestrian and bicycle issues can compete for attention, and there is a danger that pedestrian program elements will be overlooked in a city or State that has an active and well-established bicycle program. Seattle and Portland are two notable exceptions as they have hired full-time pedestrian program staff.

3. Regulations and Ordinances.

Plans and policies do not guarantee implementation. Regulations and ordinances, such as requirements to include bicycle parking or pedestrian access in new developments, can and do.

4. Design manuals and practices.

With the right information written into these documents, bicycle and pedestrian facilities will be built in as a standard feature of road construction and reconstruction projects.

5. Project review.

A key role of program staff is to review transportation and development projects early in the process to ensure adequate consideration has been given to bicycling and walking.

6. Training.

A lone bicycle/pedestrian program staff person within a large highway department has a limited ability to improve conditions, unless he or she can train and develop the professional skills of his or her colleagues. A wide range of training opportunities exists.

7. Ridesharing and Transportation Demand Management.

Bicycling and walking programs have been legitimized by the general shift to developing alternate modes of transportation—raising them above the inconsequential or luxury status they once had.

8. Maintenance.

State and local agency maintenance programs have a direct impact on the walking and bicycling environment and must not be overlooked. The city of Seattle has a model

program—the Bike Spot Improvement Program—to ensure a well-maintained transportation system for bicyclists and pedestrians.

9. Citizen participation.

Citizens have played a vital role in initiating and sustaining bicycle and pedestrian programs and have a unique role to play in the process of institutionalization. Often this is achieved through a Citizens Advisory Committee or task force.

Legitimizing Bicycling And Walking

Bicycling and walking must be seen as legitimate activities by the general public and politicians as well as traffic engineers and planners. Public acceptance can be achieved in many different ways. Among the more successful developments have been:

- **Police on Bikes.** More than 200 police departments now use bicycles as a routine part of their equipment. Foot patrols are helping “community policing” efforts.
- **Mileage allowances.** Agencies can treat bicycles as they do cars by paying mileage allowances, having company bicycles, etc.
- **Corporate commuting.** An increasing number of corporations actively promote bicycle and pedestrian commuting.
- **Events and promotions.** Bike-to-work events and celebrity/politician rides are popular media events which earn bicycling credibility.
- **Laws and regulations.** Changes to driver training requirements and State vehicle codes can strengthen the “right to the road” of pedestrians and cyclists.
- **Safety and education.** Programs to guarantee a minimum level of skill help show the concern of the bicycle and pedestrian community—and improve traffic safety. School traffic safety curricula typically fall short of this goal.
- **Public relations.** Constant reminders of the existence and popularity of bicycling and walking—e.g., through maps, signed routes, safety posters on buses, and regular newspaper stories—can overcome lack of awareness of the two modes.
- **Statistics.** Official statistics often underestimate the amount of bicycling and walking by discounting short trips or favoring miles traveled over trips made.

Conclusions and Recommendations

1. The institutionalization of bicycling and walking is essential for the development of bicycle- and pedestrian-friendly communities. This is especially true following passage of ISTEA and the Clean Air Act Amendments of 1990.
2. Agency heads and policy makers must endorse and actively support efforts to improve conditions for bicycling and walking.
3. Three elements are required for institutionalization:
 - A full-time coordinator or program manager
 - Supportive politicians and professionals
 - Active and involved citizens
4. Training is essential—and available—for each element.
5. Institutionalization takes time. States and cities with a long-running program will be able to integrate their activities more readily than those beginning to address bicycling and walking.
6. All the elements of a successful bicycle program—from facilities to education and encouragement programs—are in operation somewhere in the U.S. There is no one place where everything is being done—and such a project could provide a useful demonstration project for the Federal Government to support. Pedestrian programs have not been developed to the same level of experience and expertise.
7. The development of bicycle programs over the last 20 years may be a useful model for pedestrian and emerging technologies to follow.
8. Success breeds success and results stimulate progress. Performance goals should be set at all levels of government to measure progress towards the development of bicycle- and pedestrian-friendly communities.

Section 2. Introduction

In October 1990, Congress appropriated \$1 million for a National Bicycling and Walking Study, to be carried out by the Department of Transportation. The aim of the study is to determine the potential of bicycling and walking as modes of transportation in the United States, and to determine the costs and actions necessary to realize this potential.

A significant part of the study is dedicated to finding out how State and local governments already deal with bicycling and walking, as this will help identify the issues and problems associated with promoting these modes.

In carrying out the national study, the Federal Highway Administration commissioned a number of detailed case studies. One of the case studies deemed necessary was an analysis of how bicycle and pedestrian considerations are integrated into State and local transportation planning, design, and operations. This process of integration has become known as "institutionalization."

Over the past 2 or 3 years, one of the best examples of institutionalization has been provided by the Federal Government, and the National Bicycling and Walking Study is an important part of that process. This example is given in Section 3.

The majority of the report deals with the various elements of integration that a State or local government agency can go through to make bicycling and walking a routine part of its operations. An important element, dealt with in Section 5, is the way in which bicycling can become a normal, everyday activity in the eyes of the general public.

Section 3. Institutionalization

Over the last 6 years, the bicycle community has increasingly referred to the process of integrating bicycle and pedestrian considerations into State and local planning, design, and operations as "institutionalization." Throughout this report, institutionalization is used instead of the longer definition.

The city of Seattle has become almost synonymous with the term. The city's bicycle and pedestrian coordinator has presented workshops at national, regional, State, and local conferences, and training courses outlining the many ways in which the process of institutionalization can be achieved. (1)

Another excellent example of institutionalization in progress can be found at the national level. During the 1980's, the Federal Government and Congress played a minimal role in the development, safety, and promotion of bicycling and walking. The Department of Transportation had fewer than two full-time employees working specifically on these issues, and bicycle-related legislation had not been introduced in Congress since the early part of the decade.

Since 1989/90, however, that has changed dramatically, and bicycling and walking have started to become fully integrated into the activities of the Federal Government. For example:

1990

In February, the U.S. Department of Transportation issued a new National Transportation Policy, "Moving America: New Directions, New Opportunities." The document says it is Federal transportation policy to:

Promote increased use of bicycling, and encourage planners and engineers to accommodate bicycle and pedestrian needs in designing transportation facilities for urban and suburban areas. (2)

In September, the Federal Highway Administrator, Dr. Thomas Larson, addressed the Pro Bike 90 Conference in Arlington, VA. In his speech he committed his agency to hiring a full-time bicycle coordinator and to starting the process of rulemaking to determine whether bicycle and pedestrian programs should be added to the list of "priority areas" eligible for expedited funding under the Section 402 program. Both of these actions were done.

The FHWA published a special brochure—released at the Pro Bike Conference—detailing how bicycle and pedestrian facilities could be funded with Federal-aid highway money. (3) In addition, Dr. Larson's presentation was printed and circulated to all FHWA Regional and Division Offices. (4)

In October, Congress appropriated \$50,000 towards hiring a full-time bicycle and pedestrian program manager in the Office of Secretary of Transportation and an additional \$1 million for a National Bicycling and Walking Study. (5)

1991

On May 7, the FHWA Administrator issued a Policy Memorandum on bicycle and pedestrian projects in which he wrote:

I want FHWA to take a strong leadership role to help achieve increased recognition of the rights of bicyclists and pedestrians to use the Nation's highway system (except on Interstate and other freeways where prohibited), and to ensure that bicyclists and pedestrians (including the handicapped) are appropriately considered in the planning, design, construction, and operation of highway facilities. I am specifically asking that the field offices ensure that full consideration is given to the safe accommodation of bicycle and pedestrian traffic on all Federal-aid highway projects. (6)

In June, the Office of the Secretary of Transportation hired the National Bicycle and Pedestrian Program Manager.

On August 7, another policy memorandum was issued by FHWA outlining simplified procedures through which bicycle and pedestrian projects can pass in order to be built with Federal-aid highway funds. This was in direct response to comments from States seeking to use these funds. (7)

In the fall, FHWA awarded a 3-year contract to provide up to 40 local training courses for traffic engineers and planners on accommodating bicycle and pedestrian traffic.

On October 4, the Section 402 Rulemaking process ended. Bicycle and pedestrian programs were given priority status. (8)

On December 18, President Bush signed into law the Intermodal Surface Transportation Efficiency Act (ISTEA). (9) This contains significant language on bicycle and pedestrian provisions and programs. (10)

1992

In January the FHWA issued a memorandum on the appointment of State bicycle and pedestrian coordinators, based on the provisions of ISTEA. They recommended the positions be full time where possible. (11)

Individually each of these actions has a limited impact. Seen as a whole, they make clear the renewed commitment of the Federal Government to promoting bicycling and walking as modes of transportation. This impacts other Federal agencies and State and local governments. Combined with considerable Congressional activity throughout this period, bicycling and walking have become an important and integral part of national transportation policy.

The National Bicycling and Walking Study itself will identify further steps the U.S. DOT and other agencies can take in the future, as more remains to be done.

Many of the same elements and opportunities for institutionalization exist at the State and local level. This report will review nine such elements that are common to most levels of government and most government agencies. Each of these elements is essential to institutionalize bicycling and walking at the State and local level.

Section 4. Elements of Integration

1. Bicycle and Pedestrian Program Staff

One of the key elements of any successful bicycle and/or pedestrian program is the presence of a full-time coordinator in the transportation, engineering, or planning department of the State or local government. (12)

Many of the activities and processes by which institutionalization can take place are best handled by a coordinator working on the inside, rather than, or in addition to, advocates working outside government, although there is still an important role for advocates to play in the process of institutionalization.

Other case studies being developed as part of the National Bicycling and Walking Study deal with the appointment and function of coordinators in both State and local Government agencies. In addition there are a number of publications and papers available that address this issue. (13)

2. Plans and Policy Documents

The need for bicycle and pedestrian provisions to be fully integrated into State and local plans and transportation policy documents has assumed even greater significance than ever with passage of the ISTEA and the Clean Air Act Amendments of 1990.

Prior to this legislation, planning documents in particular were often viewed as little more than lengthy “wish lists” for State and local Government agencies. Many States and metropolitan areas have written bike plans in the last 25 years, but very few of them have ever been acted upon.

States were not required to have long-range transportation plans until ISTEA was passed, and Metropolitan Planning Organizations (MPOs) have had little or no control over project selection until now. Typically, therefore, State highway agencies have dominated the spending of highway and transportation dollars, and have favored highway-oriented provisions. Plans developed at the metropolitan level would often contain many worthy transit and nonmotorized projects, but these might never be funded by the State.

ISTEA makes a number of important changes. Sections 1024 and 1025 of the new legislation amend Sections 134 and 135 of Title 23 of the U.S. Code and create a new planning process for States and metropolitan areas. Both levels of government are required to produce annual transportation improvement programs (TIP) and long-range transportation plans.

These plans “shall provide for the development of transportation facilities (including pedestrian walkways and bicycle transportation facilities) which will function as an intermodal transportation system.” (Sections 1024 (a) and 1025 (a))

State long-range plans are required to “consider strategies for incorporating bicycle transportation facilities and pedestrian walkways in projects where appropriate throughout the State.” (Section 1025 (c)(3))

State long-range plans are also required to have “a long-range plan for bicycle transportation and pedestrian walkways for appropriate areas of the State, which shall be incorporated into the long-range transportation plan.”

What sets this legislation apart from previous transportation bills is that the plans have to be based on criteria which will guarantee their implementation. For example:

- Long-range MPO plans must include a financial plan that demonstrates how the plan is to be implemented.
- MPO Transportation Improvement Programs must include all projects to be funded under Title 23, and must provide a priority list of projects to be carried in each 3-year period after adoption of the TIP.
- The TIP must include a financial plan demonstrating how implementation will progress, and this plan must be consistent with funding reasonably expected to be available during the relevant period.
- Projects in the TIP must be consistent with the long-range plan.
- Each State's Secretary for Transportation must certify that the planning process has indeed been carried out in the prescribed manner, at least every 3 years.

Many of the same requirements are made of each State long-range plan and State Transportation Improvement Program (STIP). The STIP must be consistent with the long-range plan and the MPO TIP. The plans must be consistent with State Implementation Plans under the Clean Air Act. (14, 15)

Although the mechanics of how these plans are developed will be different in each State and metropolitan area, for bicyclists and pedestrians the implications are quite clear. For a particular bicycle or pedestrian facility to be built, it must appear in one or

both of these planning documents. For example, even before ISTEA the Virginia Department of Transportation would not program bicycle projects unless they first appeared in a local plan. (16)

The North Carolina bicycle program has developed a process by which bicycle projects are identified at the local level and included in the State TIP process. (17) Project ideas are solicited from local governments, individuals, and organizations through public meetings and written requests. The Bicycle Program office evaluates and prioritizes all the requests and presents a summary of each to the State Bicycle Committee for review.

Recommendations on the adoption and scheduling of appropriate projects are then forwarded to the North Carolina Board of Transportation for a determination as to whether the project is included in the TIP. Finally, as with other projects in the TIP (pre-ISTEA), a determination is then made as to the feasibility of carrying out the project.

The North Carolina DOT has regularly set aside a substantial sum of money for independent construction and non-construction bicycle projects. Up to \$2 million is to be made available from Federal funds for FY 1993. (18)

Separate Or Integrated Plans?

The ISTEA says States must “develop a long-range plan for bicycle transportation and pedestrian walkways . . . which shall be incorporated into the long-range transportation plan.” (19)

Does this mean States should develop a separate bicycle plan and a separate pedestrian plan and add them as appendices or distinct chapters of a State long-range plan, or should they insert relevant bicycle and pedestrian projects and program activities throughout the entire State plan?

No definitive answer is provided in the legislation or subsequent guidance notes from the Federal Highway Administration. (15) Previous experience from the States suggests many different approaches will be taken. Some States have already developed the kind of plan required by ISTEA. Others, such as New Jersey, have already announced plans to develop comprehensive statewide bicycle and pedestrian plans. (20)

Minnesota

In February 1992, the Minnesota Department of Transportation adopted “Plan B: Realizing the Bicycle Dividend,” a new statewide comprehensive bicycle plan. (21) Written by the statewide Bicycle Advisory Board and the State Bicycle Coordinator, Plan B is quite unique among this genre of documents in its scope and level of detailed recommendations and performance targets.

Specific recommendations are provided for no less than 13 State agencies ranging from the Department of Transportation to the Environmental Quality Board, Department of Education and State Department of Health. Most of these agencies are represented on the Advisory Board.

There are 16 program and 19 policy recommendations with detailed cost and benefit estimates. The overall objectives for 1999, on which the whole plan is based, are:

- For bicycle miles traveled to grow by 10 percent each year.
- For the bicycle fatality and injury rates per mile traveled to fall by 50 percent from the 1985 rate.
- For 100 percent of bicycles in Minnesota to be registered.

The achievement of these ambitious goals will require the concerted efforts of the entire State government—and the plan identifies the role each agency can play.

The Department of Transportation, which has a Bicycle Program Manager in addition to the statewide coordinator, has its own plan for contributing to the overall goals of the State: The State Bicycle Transportation System Plan. (22)

Most important, the plan describes the process by which the Department of Transportation routinely includes bicycle provision in its project development, design, and implementation. Once a segment of trunk highway has been identified as a bicycle corridor or roadway segments have been identified as unsatisfactory for bicycle travel, improvements should be implemented along with ongoing roadway construction, resurfacing, reconditioning, or reconstruction work along that section of highway.

Further, the plan states that “bicycle improvements to provide safe crossings of major physical barriers should be a normal part of bridge design work and should be implemented at the appropriate stage of bridge construction or reconstruction.”

By 1999, Minnesota DOT hopes to improve 500 miles of urban arterials, 500 miles of other urban roads, and 500 miles of rural roads for bicyclists—at an annual cost of \$16 million. While this sounds ambitious, one of the advantages of successful institutionalization is that much of this cost is wrapped up in ongoing highway work for little or no extra real cost. Between 1984 and 1987, it is estimated that \$6 million was spent on shoulders, bridges, and bikeways on the trunk highway system—because “trunk highway and bikeway improvements have become a routine part of the project development process within the Minnesota DOT.” (21)

Colorado

In September 1991, the Colorado Department of Transportation published a policy document, *Statewide Improvements for Transportation*, in which bicycle and

pedestrian issues are dealt with in a single chapter. (23) The focus of the chapter is on developing a work program for the bicycle and pedestrian coordinator rather more than on identifying ways in which the needs of bicyclists and pedestrians can be institutionalized.

The section on pedestrian issues highlights the potential danger of combining bicycling with walking issues in a State which has paid some attention to bicyclists, but not pedestrians, for many years. The chapter is much stronger on bicycle issues and has very little real specific guidance on developing a pedestrian program—except to recommend the hiring of a full-time pedestrian coordinator.

In some States, the result of this approach could be that the bicycle program could exist in a vacuum from the rest of the transportation department—doing useful work, but not really affecting the way in which the DOT as an agency does business.

Oregon

Quite the reverse is true in Oregon, where two recent publications highlight the extent to which bicycling and pedestrian considerations have been institutionalized through inclusion in the long-range planning process.

Transportation Planning Rule 660-12, developed by the Land Conservation and Development Commission, is intended to ensure that “the planned transportation system supports a pattern of travel and land use in urban areas which will avoid the air pollution, traffic and liveability problems faced by other areas of the country.” (24)

Reduced reliance on the automobile is a fundamental strategy for achieving this. Rule 660-12-035 requires transportation system plans in metropolitan areas to reduce motor vehicle miles traveled per capita by 10 percent within 20 years and by 20 percent within 30 years of adoption of the plan. Plans must specify measurable objectives for how an increase in non-auto trips will help accomplish this goal.

Section 660-12-020 requires each transportation system plan to include a bicycle and pedestrian route network, among many other items.

In November 1991, the Department of Transportation Strategic Planning Section issued a draft transportation policy. (25) Bicycling and walking appear on almost every page of the document which proposes a State transportation system based on the following characteristics:

- Balance
- Efficiency
- Accessibility
- Environmental Responsibility
- Connectivity among places
- Connectivity among modes

- Safety
- Financial Stability

A separate bicycle plan is one of seven modal system plans to comprise the unified transportation plan. Specific consideration of bicycling and walking provisions appear under the goal of "liveability," where the goals of the State are to "promote safe, comfortable travel for pedestrians and bicyclists along travel corridors and within existing communities and new developments." Actions towards this end are to:

- Retrofit transit vehicles to accommodate bicycles.
- Install secure, weather-proof bicycle parking at transit stations and commuter destinations.
- Renovate major streets and highways with bike lanes; design intersections to encourage the use of bicycles.
- Install well-lighted shelters for transit passengers.

Under a section on rural mobility, the draft policy recommends improving rural highways by providing paved shoulders and implementing a statewide system of bikeways on current rights-of-way and on new paths along abandoned railroad lines.

A pedestrian and bicycle safety program is also proposed to emphasize the "proper, safe interaction between motor vehicles and pedestrians and bicyclists."

These two documents represent the next important stage in the development of the Oregon bicycle program. While the program is a separate division within the transportation agency, which has produced an excellent and recently updated separate 1992 bicycle master plan, (26) the goals of the program have been adopted and are to be implemented by the entire Oregon Department of Transportation.

Delaware

The Delaware Department of Transportation commissioned a detailed report to determine the necessary strategies for developing and implementing a statewide bicycle and pedestrian plan. (27) The study, completed in December, 1991, recommended a Task Force approach, coordinated by the DOT but involving numerous State, metropolitan and local agencies and the public.

According to the authors:

The proposed task force process is not intended to reassign duties or relocate responsibilities among the member organizations. The objective is to assure that all necessary and appropriate actions are taken, and that there is no

duplication of effort. It is reasonable to anticipate that evolution of the task force organization would result in integration of the walking and bicycling modes into the everyday concern of public agencies, and the private sector, throughout Delaware.

Many of the proposed strategies and issues to be considered by the task forces are the subject of this report.

Florida

Since 1979, when then-Governor Graham appointed a citizen task force to recommend appropriate bicycle program activities, the Florida Department of Transportation has been at the forefront of efforts to institutionalize bicycling and, more recently, walking.

In much the same way as Minnesota, highway projects have, as a matter of State policy, been required to provide a minimum level of provision for bicyclists and pedestrians. For most of the 1980s, all urban arterials built with State funds were required to provide wide outside lanes (14 feet or more). More recently, this has been changed to require the provision of bike lanes. (28)

In 1989, the Bicycle Program Office wrote an aluminum anniversary report on progress towards the original goals of the bike program. (29) Many of the 10 areas of work had been adequately covered—especially due to the appointment of metropolitan area coordinators in every major urban area in the State.

Since then, as the bicycle program activities have become more and more integrated to Florida DOT's work, the program focus has shifted to deal more and more with pedestrian issues. The experience in Florida seems to confirm that while many of the issues and problems facing pedestrians and bicyclists are similar, it is difficult to do justice to both modes with limited resources. The focus on pedestrian safety and promotion can get lost within an active and successful bicycle program—and vice versa.

Among the pedestrian program activities has been the recent publication of a Pedestrian Safety Plan, written in response to “the alarming number of pedestrian injuries and deaths in the State.” (30) The plan is designed to:

. . . serve as a guide to all Florida communities, regional and State governments, nonprofit groups, and others wishing help solve this long overlooked problem [of pedestrian safety].

Most important, as with the Minnesota Bicycle Plan, the task force that developed the plan was drawn from all of the affected agencies and nonprofit groups. Each has a role to play in carrying out the plan, and each agency has been involved in the

development and research of the document. The process of institutionalizing pedestrian issues is well under way in Florida.

Local Actions

Many similar approaches to institutionalize bicycling and walking have been taken at the MPO/city/county level with the development of plans and policy documents. At the local level they are often more specific and project-oriented than at the State level.

Under the new ISTEA rules this is important, as MPO plans will form the basis for State investment in urban areas and project selection by the MPOs themselves. In turn, a good proportion of MPO plans will be based on existing and updated city and county plans.

For example, the Washington (D.C.) Metropolitan Council of Governments (Wash. COG) has adopted a detailed bicycle element as part of the regional long-range transportation plan. (31) The plan calls for an investment of \$61 million to improve the quality and extent of the regional trail and on-road bikeway network throughout the national capital region. The bicycle element was based on projects already identified in the plans and program documents of the numerous city and county governments that comprise the COG.

The bicycle element was developed by a bicycle sub-committee of the Wash. COG that included not only Government agency staff but bicyclists and other interested parties. The plan was then presented to the COG for approval and integration into the regional transportation plan. This should ensure that projects in the plan are consistently funded and, where appropriate, improvements are made concurrent with ongoing highway or corridor improvements.

The importance of being fully integrated into the ongoing program of local Government agencies cannot be overstated. The city of Dallas adopted a bike plan in 1985 that called for a network of 480 miles of signed bike routes. (32) More than 300 miles have already been signed, which is good, but bicycle-specific improvements have only occurred on 20 miles of highways, where wide curb lanes have been included in new or reconstructed roads. No intersection treatments have been provided and the bike plan implementation has been all but ignored by the highway designers and planners in the city.

By contrast, the city of Seattle bicycle program regularly reports expenditures of \$4 million a year on bicycle and pedestrian improvements—due in large part to the incorporation of sidewalks, and space for bicyclists in all new and improved highways in the city. (33)

The annual work plan of the city of Seattle bicycle and pedestrian program makes no reference to a discrete pedestrian or bicycle plan. Staff efforts are directed towards

influencing specific projects, policies, or plans being developed by others—such as the State, transit agency, or MPO. (34)

The city of San Jose, CA, is in a different stage of development. Staff in the transportation department admit to having done little to actively encourage bicycling or walking for many years. The two modes have simply not been on their agenda. (35)

To change that, and to give those who wish to bicycle an opportunity and a space to do so, the city has adopted a set of goals and objectives for a comprehensive bicycle master plan. (36) Included in this are recommendations on how provision for bicyclists could be included in their routine operations. One of the stages will be the development of a bikeways master plan to help identify key bicycle travel corridors and barriers to bicycle travel that need to be overcome.

As this plan is implemented and the city becomes more used to incorporating bicycle-friendly designs as a matter of course, the need for a specific bike plan may recede. Eventually, every street and highway will be designed to be bicycle friendly.

Sometimes, city and county governments may not be as ready as those in San Jose to take the initiative in developing a bicycle or pedestrian plan. In some places, citizens have taken up the challenge and developed their own independent planning process.

The Phoenix Futures Forum is a fine example of a citizen-based, long-term planning project that has been welcomed by city and regional officials. (37) Indeed, the Vision Statement produced by the Forum was adopted by the Phoenix City Council as the official Vision for Phoenix, Jan. 30, 1990. Included in the goals of the Forum are:

- Separate traffic where possible. On major streets make sidewalks separate from roadways.
- Develop extensive facilities to encourage cycling.
- Provide sufficient funds in all major street improvements and public projects to meet the standards for landscaping as well as pedestrian and cycling facilities.
- Develop pedestrian systems which attract and serve short trips and recreational travel and which provide access to public transportation.
- Enable all to use pedestrian facilities throughout the city regardless of their physical condition.

In 1987, the Manhattan Borough President, David Dinkins, established the Planning for Pedestrians Council to evaluate the needs of pedestrians in the Borough and to make recommendations for improving the safety and quality of street life. Citizen

involvement was, again, critical to the development of the report, which contains a great many detailed policy and programmatic recommendations for the Borough Council. (38)

In a similar move, the city of Boston recently appointed a task force to develop a plan to reduce pedestrian accidents in the city. The task force plan combined engineering, education, and enforcement programs in a way that would institutionalize pedestrian safety measures into city operations. (39)

Many of these State and local planning documents comprise both policy and planning elements—describing overall goals and detailing strategies and particular highway corridors for attention. For a State or city just starting to deal with bicycle and pedestrian issues for the first time, it seems the best approach is to develop a separate document containing overall policy recommendations, more detailed goals and objectives—such as the performance goals under which the Oregon program operates—and a plan for institutionalizing the issues in the months and years ahead. As the process develops, the goals, objectives, and policies will gradually be adopted and implemented by the appropriate agencies.

The Clean Air Act

Passage of the 1990 Clean Air Act Amendments (CAAA) provided yet another opportunity for the institutionalization of bicycling and walking. Section 108 of the CAAA lists 16 transportation control measures (TCMs), which have a unique status within the act. When a non-attainment area under the CAAA fails to achieve compliance, Federal transportation funds will be frozen for all activities save safety programs or TCMs. In addition, Section 176(d) of the Act mandates that the 16 TCMs be given priority consideration in funding.

Three of the 16 TCMs relate specifically to bicycling and walking:

- ix) programs to limit portions of road surfaces or certain sections of the metropolitan area to the use of nonmotorized vehicles or pedestrian use, both as to time and place;*
- x) programs for secure bicycle storage facilities and other facilities including bicycle lanes, for the convenience and protection of bicyclists, in both public and private areas;*
- xv) programs for new construction and major reconstructions of paths, tracks, or areas solely for use by pedestrian or other nonmotorized means of transportation when economically feasible and in the public interest.*

Congestion Mitigation and Air Quality Program

Under interim ISTEA guidance issued by the FHWA, TCMs are listed as one of five activities that so clearly provide air quality benefits that they are automatically eligible for funding under the Congestion Mitigation and Air Quality Program created by ISTEA. The same guidance note lists bicycle and pedestrian programs as a second of the five activities.

Construction of bicycle and pedestrian facilities, nonconstruction projects related to safe bicycle use, and State bicycle/pedestrian coordinator positions as established in the ISTEA, for promoting and facilitating the increased use of nonmotorized modes of transportation. This includes public education, promotional, and safety programs for using such facilities.

Thus, not only are bicycling and walking measures listed as eligible projects for CMAQ funding, and as TCMs under the CAAA, but their development is specifically highlighted in the legislation as being worthwhile. This makes their inclusion in State and local transportation plans much more likely, and thus enhances the possibility that they will be funded and implemented.

Summary

1. ISTEA makes planning documents and processes at the State and local level more important. To obtain funding, bicycle and pedestrian projects must be included in State and MPO short- and long-range transportation plans.
2. Institutionalization takes time. Plans and policy documents are an important first step, and the degree to which separate pedestrian and bicycle plans are needed depends on the experience of a State or local agency in dealing with these issues. The newer the issue, the more likely a separate bicycle or pedestrian plan is needed.
3. Plans and policies are only one step towards institutionalization—implementation is what counts. The following sections of this report detail some of the many ways implementation can be achieved.
4. Pedestrian and bicycle issues can compete for attention. There is a particular danger that pedestrian program elements will be overlooked in a State or city which has an established bicycle program. Seattle, WA, and Portland, OR, are exceptions, for they have hired pedestrian coordinators in addition to bicycle staff.
5. Citizen involvement in the development of plans and policies is essential.

3. Regulations and Ordinances

Once plans and policy documents have been written, implementation is the next hurdle to overcome. One way to ensure compliance with plans and policies is to require or regulate certain activities so that they have to be done. This avoids the need to argue for special provision on a case-by-case basis.

One of the most common examples of this type of regulation is a bicycle parking ordinance setting out minimum levels of bicycle parking in all new developments. Similar regulations govern the provision of facilities for the physically challenged.

Among the communities with bicycle parking ordinances are:

Madison, WI	Palo Alto, CA
Boulder, CO	Eugene, OR
Portland, OR	Austin, TX
Gainesville, FL	Seattle, WA
Davis, CA	Arlington, VA
Tucson, AZ	Dallas, TX
Los Angeles, CA	

The Madison, WI, ordinance is described in detail in *Bicycle Forum* magazine, and provides a valuable insight into the approach taken in Madison and other communities. (See Appendix 1.) The city of Los Angeles adopted a parking ordinance in November 1991, and joined Palo Alto, CA, in going one stage beyond simply requiring just bicycle parking. (40) The new ordinance requires all new commercial office, retail, and industrial buildings over 10,000 square feet to have at least one bicycle parking space and bicycle parking at a rate of 2 percent of required auto parking. They must also supply an equivalent number of clothing lockers.

Office and professional buildings over 50,000 square feet must provide one shower per gender and another shower per gender for every 100,000 square feet over 50,000 square feet. All other retail and commercial buildings must supply at least one shower per gender over 100,000 square feet, and one more shower per gender for each additional 200,000 square feet. Industrial uses over 50,000 square feet must provide one shower per gender.

The Northeastern Illinois Planning Commission produced two reports with development guidelines, one for pedestrian access and safety and the other for promoting bicycle use. The bicycle use guide gives recommendations on how to include provisions for bicyclists in arterial redevelopment, bicycle access within and between developments, and bicycle parking requirements. (41) The pedestrian safety guidelines follow a similar pattern. (42)

The City of Tucson also has a development standard relating to pedestrian access that provides certain design criteria for pedestrian circulation paths to, and within, places of public accommodation, to transportation and to housing. Requirements include the provision of at least a 4-foot sidewalk linking buildings with bicycle and car parking, recreation areas, and all common use areas. (43)

4. Design Manuals and Practices

One of the most important areas to address in the institutionalization of bicycling and walking is the process by which highways and other transportation facilities are designed and built. The physical dimensions and appearance of the highway system are perhaps the most important determinants of bicycle and pedestrian activity.

Most States and many localities have design manuals, standards, and practices which determine such key issues as whether or not streets have sidewalks for pedestrians or bike lanes for bicyclists. At the national level, the AASHTO Policy on Geometric Design of Streets and Highways is very influential. (44) Many States adopt this document as their own design guide, or base their own very closely on the "Green Book," as it is known.

With the right information in these documents, bicycle and pedestrian facilities will be built in as standard features of new and reconstructed roads. Without this information, the system will be built without the requisite space for the safe operation of these two modes.

A number of States have developed their own separate bicycle facilities manual, or have included a section on bicycle facility design in their State manual. Among the most important such documents are:

California Highway Design Manual (45)

The California Department of Transportation (Caltrans) developed one of the earliest design manuals for bicycle facilities. Much of the subsequent literature, including the influential AASHTO *Guide to the Development of Bicycle Facilities* (55), has been based on the Caltrans manual, and for the last 20 years streets and highways throughout California have been designed according to the specifications in this manual. The bikeway design section is a chapter in the State's highway design manual.

A similar approach is followed by the Washington and New York State transportation departments. (46, 47)

Arizona Bicycle Facilities Planning and Design Guidelines (48)

This is a 120-page, stand-alone document that covers the location, selection, and design features of bicycle routes, bike lanes, and paths, as well as the signing of these

facilities. The second section has a valuable list of selection and location criteria to consider, including the provision of access points to bicycle facilities, the directness of routes, and the existence of barriers and delays—such as freeways, rivers and too many stop signs—which will help make bicycle facilities successful and popular.

A similar approach is followed by the North Carolina, Minnesota, Florida, and Oregon transportation departments. (49, 50, 51, and 26)

New Jersey Bicycle Compatible Roadways—Planning and Design Guidelines (52)

This guide is one of the clearer examples of institutionalization in progress. In the early 1980s, New Jersey DOT adopted a policy of providing bicycle-compatible highways. This manual showed how the policy was to be implemented and contains practical information on design criteria for wide curb lanes, bicycle-safe drainage grates and utility covers, signalized intersections, railroad crossings, maintenance, and other on-road improvements.

Important State documents on particular aspects of bicycle facility design have been developed by Wisconsin (shoulders) and Florida (wide curb lanes, bike lanes, and shoulders). (53, 54)

A key question is whether these design specifications work better when included in manuals covering all aspects of highway design, or as separate documents. At the national level, the feeling among bicycle advocates and professionals is that the AASHTO *Guide to the Development of Bicycle Facilities* (55) should be incorporated into the AASHTO “Green Book”—as are pedestrian facilities—as soon as possible.

The AASHTO bicycle guide provides good design information, but only for those few engineers who take the trouble to obtain a copy. The majority of engineers have only the Green Book on their desk, and this is where the bicycle information would be of most value.

The argument still remains, however, as to how this incorporation should be achieved. There are so many basic highway design features that impact bicycle and pedestrian safety—such as lane widths, turning radii, and intersection design—that bicycle and pedestrian consideration should be built into each and every page. With a separate chapter, just as with a separate manual, it is too easy for engineers to ignore or overlook the needs of nonmotorized travel modes.

Florida Pedestrian Safety Plan (30)

A recently published plan for the development of a better pedestrian environment in Florida has some specific design criteria for the installation of sidewalks and crosswalks. For example, the recommendations include:

- Sidewalk Policy Recommendations:

1. *At a minimum, 5-foot sidewalks should be included on both sides of all urban area roadways except limited access highways, unless land use dictates a need on only one side. Every effort should be made to add sidewalks to all existing urban streets where they do not exist, and to complete missing links.*
- **Design or Technical Recommendations:**
 1. *The desirable sidewalk width is 5 feet. For safety reasons, FDOT discourages the building of facilities to minimal standards.*
 2. *The minimum desired width for a utility strip (between the sidewalk and roadway) without trees is 3½ feet. With trees, the minimum width should be 7 feet.*
 3. *Where sidewalks must be placed immediately adjacent to the curb—and this is discouraged—they should be at least 6 feet wide.*
 - **Crosswalk Policy Recommendations**
 1. *A prohibition of right-turn-on-red should be considered at those intersections where pedestrian volumes are significant and field studies suggest this treatment.*
 2. *Install two pedestrian curb ramps per corner, as near as possible to the pedestrian pushbutton A single ramp is not desirable as it will direct pedestrians into through-traffic.*
 3. *Medians are recommended wherever the crossing distance exceeds 60 feet to provide a refuge for slow or late crossing pedestrians Refuge islands should preferably be at least 6 feet and in no case less than 4 feet wide to reduce the danger to island users*
 - **Crosswalk Design Recommendations**
 1. *Include the use of traditional neighborhood developments and grid systems to reduce the need for pedestrians to use a signalized intersection to reach their destination.*

2. Construct T-intersections which have fewer conflict points for pedestrians.

Design practices and policies are equally important at the city and county level—where many of the crucial decisions are made that affect the walking and riding environment of most city streets.

The city of Tucson, AZ, has a requirement “to provide for safe use by bicyclists, capital improvement projects on major streets and collectors shall be designated with 17-foot outside lanes to provide 5-foot striped bike lanes, where feasible.” Since the policy was adopted, the number of on-street bike routes have increased 75 percent. (56) There were more than 100 center-line miles of signed and striped bike lanes with the city by 1985.

As was mentioned earlier, the city of Tucson also has guidelines requiring a minimum level of pedestrian provision in new developments. (43)

The city of Orlando, FL, has one of the most specific design requirements in the country. It states:

The city shall include or require curb lanes of fourteen (14) feet on all new or reconstructed thoroughfares within the city of Orlando excluding limited access facilities. Whenever the use of 14-foot lanes is not feasible, justification for narrower lanes must be included as part of the road design process. (57)

The city of Seattle is one of very few agencies with quite specific pedestrian facility guidelines. (58) These are shown in appendix 2.

5. Project Review

At the State and local level, every transportation project has to go through a detailed review process—the length and detail of which is determined by the scope of the project involved. At some point during the review process, each and every project should be studied to ensure that the needs and concerns of pedestrians and bicyclists have been addressed.

In agencies where they exist, this function is often carried out by a bicycle/pedestrian coordinator or program manager. In a 1990 survey of bicycle coordinators, respondents were asked which activities they had devoted time to over the past 12 months. (59) The percent involved in project review and facility design was high:

- Facility design 63 percent
- Facility planning 61 percent
- Highway project review 50 percent
- Site/subdivision review 48 percent

The North Carolina Bicycle Coordinator reports that he still sees 15 to 20 highway project designs every week and after 17 years of the program still has to remind colleagues to include appropriate provisions for bicyclists. (60)

However, as other engineers and consultants come to know what to provide, the need for detailed review should become less and less. This is especially true if other elements of institutionalization take hold—for example, training courses, design mandates, and policy statements requiring consideration of bicycle and pedestrian facilities.

In addition to project reviews, documents such as environmental impact statements, master use planning permits, and scoping reports should all be subject to review to ensure the appropriate consideration of bicycle and pedestrian provision.

6. Training

One of the key elements of a successful bicycle program identified by Clarke (12) is receptive and knowledgeable public officials. The same is true for pedestrian programs. A lone bicycle and pedestrian coordinator within a large highway agency has a limited ability to improve conditions dramatically—unless he or she can train and develop the professional skills of his or her colleagues.

Most traffic engineers and planners receive little or no formal training in bicycle and pedestrian planning while in school. (61) For a whole generation of engineers and planners, bicycling, and walking have simply never been an issue with which they have had to deal. Thus, they have no expertise or skills, and can feel uncomfortable even dealing with bicycle and pedestrian issues.

Institutionalization, therefore, has to address the training and education of professionals in Government agencies. A number of States—Florida, Colorado, Washington, and Illinois, for example—have organized training courses for State agency and MPO employees. A sample curriculum for one such course is provided as Appendix 3.

The Florida Department of Transportation has probably done the most in this field, both for pedestrian and bicycle considerations. Soon after the hiring of bicycle and pedestrian coordinators in most metropolitan areas in the State, the DOT contracted for 3 weeks of training over an 18-month period to cover the issues involved in being a bicycle and pedestrian coordinator.

During the first half of 1992, the Florida DOT staged 30 pedestrian facility design workshops, reaching over 1,500 traffic engineers all over the State. More are planned for the rest of 1992.

The Federal Highway Administration and National Highway Traffic Safety Administration are developing a series of up to 40 bicycle and pedestrian training courses for Federal, State, and local agency personnel, to be carried out over the next 2 years.

Besides training courses, there are many other ways of educating engineers and planners. For example:

Conferences

- **Pro Bike Conference.** Held every 2 years, the Pro Bike Conference is the largest gathering of bicycle professionals in the U.S. Covers program development, facility design, education and safety programs, and advocacy. Organized by the Bicycle Federation of America.
- **International Pedestrian Conference.** Hosted annually by the city of Boulder, CO, and now in its thirteenth year, this conference combines architectural, planning, and engineering disciplines to focus on design issues.
- **Rails to Trails Conference.** Held every 2 years, attracts up to 400 trail planners, engineers, and advocates and features trail design and program management techniques. Organized by the Rails to Trails Conservancy.
- **State Bicycle Conferences.** Minnesota and Arizona are among the States to host their own bicycle conferences.
- **Regional Pro Bike conferences,** such as those held by local advocates in the years between the national Pro Bike.
- **The Transportation Research Board, Institute of Transportation Engineers, American Society of Civil Engineers, and Association for Commuter Transportation** all have annual conferences which feature bicycle and pedestrian sessions.
- **The National Trails Symposium** is held every 2 years.

Publications

Regular publications with articles relating to aspects of bicycle and pedestrian program activities help to confirm the existence of these activities elsewhere and enhance technology transfer. Among the more useful publications available are:

- *Pro Bike News*. Monthly roundup of bicycle and pedestrian program activities around the country. Published by the Bicycle Federation of America.
- *Bicycle Forum*. Quarterly journal featuring in-depth articles of interest to engineers and planners involved in bicycle program activities. Published by Bikecentennial.
- *Urban Transportation Monitor*. A roundup of studies, reports, and practice affecting all urban transportation modes, including bicycling and walking. Published every 2 weeks by Lawley Publications.

In many other publications of professional associations and advocacy groups, such as *TR News* and the *Surface Transportation Policy Project Bulletin*, coverage of bicycle and pedestrian issues is becoming more frequent.

In-house Training and Education

Once a bicycle or pedestrian coordinator becomes familiar with design, technical, and philosophical aspects of the issues, he or she should share that experience with others. In the long run, this will make his or her job easier and will lead to the development of many allies who understand the importance of bicycle and pedestrian programs.

Opportunities exist in every Government agency to provide a basic education to planners and engineers (both agency staff and consultants) who, while sympathetic towards bicycling and walking, have never had any formal training. These include:

- In-house training courses run by the personnel department.
- Informal presentations at staff meetings or lunches.
- Circulation of articles from professional magazines.
- Writing articles for internal agency newsletters and publications.

7. Ridesharing And Transportation Demand Management

In the introduction to this report, specific mention was made of the importance of ISTEA to the development of bicycle and pedestrian programs. ISTEA reflects a trend that has helped to legitimize bicycling and walking in the eyes of transportation professionals: bicycling and walking are seen as part of the solution to air quality and congestion problems being faced by every metropolitan area in the Nation.

The whole emphasis of transportation policy has shifted away from providing more vehicle lane miles for single-occupant automobile travel and towards providing for

alternatives. Bicycling and walking strategies have been officially recognized and sanctioned as legitimate activities in the fight for clean air and less congested streets.

For example, the Clean Air Act Amendments of 1990 contains a list of transportation control measures “necessary to demonstrate and maintain attainment of national ambient air quality targets.” (62) These include:

- (ix) programs to limit portions of road surfaces or certain sections of the metropolitan area to the use of nonmotorized vehicles or pedestrian use, both as to time and place.*
- (x) programs for secure bicycle storage facilities and other facilities, including bicycle lanes, for the convenience and protection of bicyclists, in both public and private areas.*
- (xv) programs for the new construction and major reconstruction of paths, tracks, or areas solely for the use by pedestrian or other nonmotorized means of transportation when economically feasible and in the public interest.*

This official recognition of the value of bicycling and walking helps to elevate the issues above the inconsequential or luxury status they once had. At the local level, transportation demand management programs have started to include bicycle and pedestrian program activities as a matter of course, and this helps to legitimize the activities in the same way.

The city of Tucson, AZ, has an Alternate Modes Coordinator who deals with bicycling and walking facilities and promotions throughout the city. In nearby Phoenix, the Regional Public Transportation Agency has recently appointed a bicycle coordinator (although many of the activities have been ongoing for a number of years) to oversee an aggressive bicycle program as part of their overall ridesharing program.

The city of Boulder has combined the activities of the bicycle, pedestrian, and transit coordinators into one “Go Boulder” initiative that produces its own monthly newsletter addressing a wide range of trip reduction strategies.

The Pierce Transit Agency in Pierce County, WA, commissioned a major study into ways of integrating bicycling and walking into their ridesharing activities. (63) Among the recommendations of the consultants were that each jurisdiction in Pierce County should:

- Become model employers for the local areas

- Have a designated employee transportation coordinator
- Establish an office of “Cooperative Commuting”
- Contact every major employer and employment center to determine current commuting patterns
- Develop a range of technical assistance materials capable of supporting and enhancing employer-based transportation demand management programs
- Fully integrate nonmotorized modes into their Cooperative Commuting program.

The report went on to identify 10 specific steps for Government agencies and 10 for employers to take in order to foster cooperative commuting. (See Appendix 4.)

8. Maintenance

In addition to annual capital improvement programs and budgets, most State and local transportation agencies also have maintenance schedules and budgets that are developed regularly. Particular streets and sections of highway and bridges are programmed for repair work, resurfacing, or reconstruction, usually at least one year ahead of time.

The city of Seattle bicycle and pedestrian program staff review this document each year to see which streets and bridges are due for work. They will then provide up-to-date information and recommendations for improving bicycle and pedestrian safety and access to those streets—for example, by recommending lane striping be modified to include a wide outside lane or bike lane.

Over a 10- to 20-year period, almost every street in an urban area will be subject to some form of restriping, resurfacing, and/or reconstruction and the opportunity can be taken to make each of these streets friendlier for bicyclists and pedestrians.

The Seattle program has also managed to integrate low-cost repairs and improvements to the street system into routine maintenance activities through a very successful “Spot Improvement Program.” The bicycle spot improvement program provides \$100,000 annually for “the identification, design, and construction of small-scale construction and signing projects to enhance bicycle access and safety. Typical improvements include curb ramps, paved shoulders, connector paths, rechannelization, drain grate installation, railroad crossing improvements, bike parking racks, signing, and striping.” (34)

Citizens are encouraged to suggest these improvements through a report card. These cards also help identify potholes and other surface irregularities, which are reported and fixed by city maintenance crews within a matter of days.

Agency staff themselves will survey all bike racks in the city for use and condition, along with trail and bikeways markings, bollards, and other traffic control devices to ensure they are properly maintained.

In Palo Alto, often considered one of the most bicycle-friendly cities in the U.S., strict standards apply to contractors and city crews carrying out maintenance work to ensure that dangerous surface irregularities are not created. In particular, quality performance goals are set for pothole repairs and patches so that a smooth ride is maintained over the work site. Similarly, metal plates covering utility holes must have asphalt surrounding them to provide a ramp or other smooth transition from street to plate.

The city also makes every effort to ensure bicyclists are able to use vehicle-actuated traffic signals. Pavement markings show bicyclists where the most sensitive part of each loop detector is located. (64)

The Denver, CO, Public Works Department is currently working on detailed construction site detour standards to ensure bikeways and trails are not rendered useless by ongoing construction work. (65) To ensure user safety, access and passage for trail and bikeway users must be maintained continuously, or an approved detour plan implemented with an absolute minimum one-week advance notice given to trail users.

Among the features of the proposed standards are requirements that:

- Construction equipment not be used which could be reasonably foreseen to cause pavement failure or damage unless replacement of the pavement has been agreed upon as part of the work permit.
- Bikeways not be used for storing equipment not being used on the bikeway or for access and parking of construction workers' vehicles.
- Govern the use of cones and other construction zone signing and placement.
- Ensure any trail surface affected be returned to its pre-construction condition, or better.
- Ensure protection of bicyclists from overhead danger (by enclosing the bikeway in a shed or tunnel structure) and from toxic fumes, paint sprays, or other threats.

At the State level, opinion varies as to the value of having a special budget for bicycle facility maintenance or relying on State highway maintenance crews to routinely

include maintenance work that ensures safe and convenient access to the highway system for bicyclists and pedestrians.

The Oregon Department of Transportation has a specific maintenance budget which it uses for very bicycle-specific maintenance work such as sweeping shoulders. Some bicycle facilities—especially trails—may require special maintenance equipment or practices, in which case a separate budget might be useful. (66)

The Minnesota Department of Transportation takes the opposite view, preferring to incorporate bicycle-related maintenance work into the routine work of State crews. However, in Minnesota, the State often tries to relinquish responsibility for trails and bikeway projects to city and county agencies once they are constructed. (67)

The success of each approach suggests that there is no simple “right way” to do things. State agencies and their personnel have different structures and relationships, and the most effective way to ensure the maintenance work gets done will vary accordingly.

9. Citizen Participation And Advocacy

The third key element of successful bicycle programs identified by Clarke is active citizen participation. (12) Citizens have played a vital role in helping to initiate, develop, and institutionalize bicycle and pedestrian programs through a wide variety of volunteer activities.

Citizen-Initiated Programs

Two of the best-known State bicycle programs in the United States were initiated as a direct response to citizen pressure. In 1970, bicyclists in Oregon lobbied for better conditions and found an ally in a State Representative who was willing to push a bill guaranteeing a minimum level of investment in bicycle provisions. (26)

The lobbying paid off, and the bill was passed. A two-person bicycle program office was established in the State Department of Transportation, and funds started to flow into projects statewide. Twenty years later, 530 miles of bikeway have been provided as a result of this funding at the State level, and many more services and facilities—such as maps, signed routes, and reports—have been developed. (68)

Almost 10 years later, citizens in Florida lobbied the Governor to do more for bicycling. He, in turn, set up a task force with citizen representation and asked it to make recommendations for a Florida Bicycle Program. In October 1979, an Executive order was passed creating just such a program, and 10 specific goals were developed. Many of these have been completed and the program has now shifted towards addressing pedestrian issues. (29)

Ten years after the Florida program started work, bicyclists in Texas began to organize around a very serious threat of bicycle bans and restrictions from sections of highway in the State. One of their goals was the appointment of a full-time bicycle coordinator in the Texas Department of Highways and Public Transportation. Through their lobbying efforts and testimony to the Texas Sunset Commission—which was reviewing the activities of the DOT—they were able to secure the appointment of a coordinator, and the designation of a bicycle contact person in each of the 24 district offices around the State.

The Texas Bicycle Coalition is now 2 years old, has close to 2,000 members, and has developed a close working relationship with State and city agencies in Austin and elsewhere. (69)

At the local level, bicyclists have been responsible for starting a number of successful bicycle programs and plans. (32) In 1985, the city of Dallas, TX, adopted an ambitious program to sign 480 miles of bike routes throughout the city, and this work is almost complete.

The city of Chicago, IL, recently adopted a remarkably bold agenda, Bicycle 2000, with the goal of making the city the most bicycle-friendly city in the country by the year 2000. (70) Much of the groundwork for the report was laid by the Chicagoland Bicycle Federation and a Mayor's Bicycle Task Force created in 1991.

Growing citizen pressure for better walking conditions helped persuade the city of Portland to hire a full-time pedestrian coordinator in June 1992 to join the bicycle program, which has been active for many years.

Similarly, the Auto-Free New York committee has generated sufficient interest in pedestrian issues in the city of New York for them to hire a pedestrian coordinator. As we have seen, the creation of such a position is a crucial step towards the eventual institutionalization of bicycling and walking.

Programs Sustained by Citizen Involvement

While most successful programs have a high level of citizen involvement, there are some where this activity stands out as being a major reason for the longevity and integration of the program into the relevant transportation agency.

The Eugene, OR, Bicycle Advisory Committee has provided continuity and permanence to a city-wide bicycle program that ranks with the best in the Nation. According to the city of Eugene:

The presence of a regular committee with a body of wisdom shared by the continuing members provides a buffer against these losses [of staff]. The program need not die

and have to be restarted, and replacements are more quickly trained. Under the guidance of the committee three bicycle coordinators [in ten years] gained their stripes and two traffic engineers learned to think bicycles. (71)

Since 1977 the city of Seattle, WA, has had a similar citizen advisory group for the bicycle program. A pedestrian committee has recently been formed. Membership of the BAC or PAC carries with it certain responsibilities, such as:

- Attendance at all meetings.
- Taking the lead on certain projects raised by the B/PAC.
- Representing the B/PAC on one other task force or committee.
- Writing a certain number of letters or attending a certain number of public hearings and meetings each month.

Candidates are screened and interviewed to ensure a high caliber of participant. Each member serves a 2-year term, which can be repeated. (72)

The Cascade Bicycle Club has been instrumental in strengthening the bicycle program in the city, and in promoting the cause of bicycling. The club has paid for special facilities such as parking stands, and has funded a full-time education director to undertake training and safety education work throughout the city.

Since the city of Orlando, FL, was cited by *Bicycling Magazine* as one of the worst places for bicycling in the country, the area Metropolitan Planning Organization has actively sought to improve conditions. In a 1992 profile of the program, the degree to which bicycling has become institutionalized is clearly shown:

Program coordinator Tom Cerny estimates there are over 100 Government employees in the metro area involved in some aspect of bicycle planning, engineering, education, and promotion as a regular part of their workload. "It is amazing how many 'pro-bikers' we found, at all levels of Government, throughout the region. That doesn't include a growing number of private sector companies who now realize the advantage of providing for cyclists. The willingness of local governments and the State DOT to fund the bicycle program gave these people something to rally around."

The program's biggest supporter is the Florida Freewheelers bicycle club. With 1,000 members and a recently hired Executive Director, the club is one of the

biggest in the State. The Freewheelers have organized rides and meetings to protest the refusal of one community to join the program, and spear-headed letter-writing campaigns to promote bicycling. "My position probably would not be here today if it were not for them," says Cerny. (73)

Programs Run by Citizens

In the absence of Government staff and resources, some volunteer groups or citizen committees effectively are the State or local bicycle/pedestrian program. For example, the Arizona Governor's Bicycle Task Force has performed many of the functions of a State bicycle coordinator, including the development of the set of bicycle facility design guidelines, a statewide bicycle suitability map, changes to the State vehicle code, and a range of other activities and publications. (74)

In the Dayton, OH, region, the Miami Valley Regional Bicycle Club performs many of the same functions as a bicycle program. They have helped identify, design, and fund trails, organized major events—both recreational and transportation-based—hosted a national trails conference, and developed materials to promote bicycle commuting.

The Pedestrian Action League (PAL) in Asheville, NC, has actively pursued the cause of better walking conditions in the city, to the extent that they have taken out full-page advertisements in the local paper discussing intersection design, and recently published a new city-wide newsletter, City Watch, covering a range of issues including pedestrian safety and design. The PAL has had a significant impact on the city transportation department in its short life. (75)

There are more than 80 State and local bicycle advocacy organizations and up to a dozen such pedestrian groups around the country. Each is engaged in a wide range of activities that complement Government actions, and presses each for greater attention to bicycle and pedestrian issues. Many of the groups work closely with Government agencies through Task Forces, Advisory Committees, and working groups. Many more individual advocates engage in the same work.

A useful description of the role and function of BACs exists, but as yet no such document exists for pedestrian committees. (72) Other advocacy literature is more commonly available for bicycle rather than pedestrian advocates. (76)

Section 5. Legitimizing Bicycling and Walking

The many ways in which bicycling and walking can become institutionalized as described in Section 4 are primarily related to the internal workings of Government agencies. Just as important, bicycling and walking have to be seen as legitimate by the general public and by elected and appointed public officials. Without a minimum level of public support for improved conditions, public agencies will not feel the need to take bicycling and walking seriously.

There is no certain way to make this happen. Public acceptance and support for bicycling and walking may be influenced in many different ways. Among some of the most important ways of achieving this somewhat intangible goal are:

Police on Bikes

Since the Seattle Police Department pioneered the reintroduction of bicycle-mounted police in 1988, more than 200 police departments have equipped themselves with bike squads. The reaction of the general public has been overwhelmingly positive—and the police themselves have been very effective.

These officers are not usually involved in traffic policing or bicycle patrols; they are regular beat police dealing with street crimes. The Seattle police department reports that 5 percent of its force now patrols on bikes, and is responsible for two of every five drug arrests. (77)

In addition to city police departments, a wide range of land management agencies and public agencies have started to use bike squads. There are even emergency medical teams patrolling major events by bicycle. (78)

Police Departments are also returning to foot patrols as part of a general move towards “community policing.”

Mileage Allowances

A small but growing number of Government agencies pay mileage allowances to employees who use bicycles in the course of business—just as they do for cars. The city of Palo Alto was one of the first to do this, offering up to 7 cents per mile in reimbursement. (79)

In the U.K., the Cyclists Touring Club urges Government agencies to pay the regular “civil service” rate of over 10 cents a mile, while some agencies—such as the London Borough of Sutton—pay their employees close to 80 cents a mile for trips made by bicycle. (80)

The city of Seattle, WA, and neighboring King County both have bicycles in their “motor” pools, available for use by engineers making site visits. (81) Michigan State University has recently implemented a program that provides bicycles for faculty members to use on campus, (82) and the Lawrence Livermore National Laboratories in California has 1,000 bicycles available for employees to use to move around their campus-style work site. (83)

Corporate and Agency Commuting

Bicycle promotions by individual companies and Government agencies have started to make a real impact on bicycle commuting rates.

- City of Glendale, AZ: In cooperation with the local police department, free bicycles (unclaimed stolen bikes held by the Police) are made available by the city to employees who ride 3 days a week for 12 months. Thirty-five out of 1,100 employees were participating in this project in 1991. (84)
- Fleetwood Enterprises, Riverside, CA. The company's Mud, Sweat, and Gears bike club (85) has helped achieve bike commuting rates above 12 percent of employees through a wide variety of financial and convenience incentives to those using bikes, including:
 - Credit towards company gift catalog purchases
 - Credit towards extra paid days off
 - Bike repair shop on site
 - Promotional events
 - Ride-matching program
 - Interest-free loans and loaner bikes on trial
- Bellevue, WA: Companies offer free parking for the 3 or 4 days a month when bicyclists and pedestrians are unable to walk or bike to work due to inclement weather or other constraints. Other employees have to pay for parking. (86)

Events and Promotions

Local bicycle clubs, walking groups, and Government agencies stage a wide range of events and promotions that raise the profile of bicycling and walking in the local media.

- **Bike-to-Work days/weeks:** Among the most impressive such events are those organized in Atlanta, GA; Toronto, Canada; Orlando, FL; and throughout the State of Colorado, especially Denver and Boulder. Promotions as part of bike-to-work events include:
 - Group rides into downtown area
 - Ride matching
 - Free breakfasts
 - Commuter races between bicyclists and motorists
 - Special parking provisions
 - Rally with speeches
 - Employer challenges to get the most bicyclists
- **Walk-a-thons and mass bike rides:** Mass participatory events such as these help to raise the profile of bicycling in the local area—for example, the Tour de L'île de Montreal attracts 45,000 riders every year and requires the closing down of city streets, receives massive publicity, and has become a very popular event that is now part of the city's life. In addition, a great many charities are able to utilize the popularity of bicycle and walking events to raise funds: the MS Society raises \$20 million annually from bicycle rides and \$16 million from walks.
- **Take a ride with a politician:** The Arlington County Bicycle Advisory Board invites County Commissioners out for a bicycle ride every year to show them the best and worst of conditions in the county. Not only does this provide a media opportunity, but it helps sensitize public officials to the concerns of bicyclists. The same opportunity exists for pedestrian-related activities.
- **Celebrity bicycle rides:** Congressman Joe Kennedy has organized a “Tour of the Eighth District” ride in his home district, Cambridge, MA. In 1992, the event included walkers and in-line skaters.

Laws and Regulations

The goal of the bicycle community for many years was the recognition of the bicycle as a vehicle (or bicyclists as having the same rights and responsibilities as motorists) in all 50 States. This was achieved in 1987. Psychologically, this was an important victory and a good organizing tool for bicycle advocates.

There are still a number of potential changes to State practices that would benefit bicyclists and pedestrians both practically and in the eyes of the general public, including:

- Driver's Education and driver's test to include pedestrian and bicycle elements.
- Removing mandatory sidepath laws that require bicyclists to use bicycle sidepaths regardless of their utility, quality, and safety.

Safety and Education

Programs to guarantee a certain level of training and ability among bicyclists can help show that the bicycle community is concerned with safety and appropriate behavior. Education programs aimed at all ages are still necessary:

- School traffic safety curriculum to be developed to cover walking, bicycling, public transportation, school bus, and driving safety and use.
- Older pedestrian information dissemination.

Public Relations

Many public officials and professionals may not come into contact with bicycle and pedestrian issues or information very frequently. They may underestimate the popularity of bicycling and walking and of the strength of feeling that exists in favor of improving conditions for the two modes.

Constant reminders can be provided of the existence of bicycling and walking through publications, public relations, and simple actions such as locating bicycle parking stands outside influential office buildings.

Other strategies include:

- Maps of bicycle and walking routes
- Signed routes are very visible
- Calendars and posters featuring bicycling and walking
- Safety brochures and Public Service Announcements
- Bus poster campaigns
- Newspaper stories about bicycle use, events, promotions, route openings, etc.

Statistics

The official collection and use of statistics can underestimate the current and future levels of bicycle and pedestrian use, creating an institutional bias against the two modes. For example, in Boulder, CO, a 1991 study reviewed the results of three different

travel surveys for the same area at roughly the same time. Modal splits for bicycling and walking varied from 28 percent of trips to 1 percent of trips—a vital difference. (87)

In the UK, author Mayer Hillman has written extensively on the way in which official statistics have discriminated against bicycling and walking. (88)

He reports that trips under 1 mile are usually excluded from national travel forecasts, as these account for only 3 percent of personal mileage and “most of these are walks.”

It can be inferred from this spurious decision that longer journeys are considered far more pertinent to policy and therefore more worthy of attention and public investment. However, this effectively leads to discrimination against those whose patterns of activity are more contained and who use walking and cycling as their predominant modes—the modes that . . . it would be in the public's interest to promote.

If journeys under 1 mile were included in the U.K.'s national travel statistics, the proportion of trips by foot would rise from 11 percent to 34 percent. Car trips would fall from 69 percent to 51 percent.

Hillman also cites the problem of only considering motorized travel in the process of determining plans for meeting future travel demand. He writes:

It would appear only motorized travel is worthy of consideration. Yet the relevance and reliability of this forecasting process would be considerably improved and the focus of policy sharpened if it were simply acknowledged that in the year for which predictions were made, close to 100 percent of the population will be able to walk and the great majority will be able to cycle, and would welcome wider opportunities to do so if proper provision were made in the form of safe networks for them. In this way, a future role for walking and cycling would be recognized and policy adjusted accordingly.

Section 6. Conclusions And Recommendations

1. The integration of bicycle and pedestrian considerations into State and local transportation planning, design, and operations is essential for the development of communities that are bicycle and pedestrian friendly.

The goal of institutionalization is, however, completely unquantifiable—and is an ongoing process requiring patience and persistence. It is also an amalgam of all the recommendations, goals, and objectives identified in this and all the other case studies carried out as part of the National Bicycling and Walking Study.

It is still true today that:

It appears that in order to accomplish even modest increases in the levels of bicycling and walking, a family of measures or incentives must be implemented. This is precisely what motorized traffic enjoys and takes for granted. The infrastructure for automobile travel includes not only the street and highway system but also safe levels of lighting, ubiquitous parking facilities and a proliferation of signs, signals, and controls aimed at ensuring a safer driving experience Assuming a need for travel exists, it is perhaps this type of commitment to a mode that is needed to ensure its acceptability and success. (89)

2. A strong message of support for bicycling and walking is required from agency heads and decision-makers. The support given to bicycling and walking issues by Federal Highway Administrator Dr. Thomas Larson has had a profound impact on the activities of the Federal Government—and that is trickling through to other agencies at the Federal and State level.

Agency heads can quickly foster a climate of acceptance for bicycling and walking that makes every activity that makes up a successful program easier to achieve.

The impact of individuals on the process of institutionalization is enormous, whether they are citizen advocates, Government agency personnel—such as bicycle and pedestrian coordinators—or agency heads.

3. In a paper presented to the Transportation Research Board in 1992, three key elements to a successful bicycle program were identified. (12) Each of the key elements is intimately connected with the process of institutionalization:
 - A full-time coordinator or program manager
 - Supportive elected officials and professionals within Government agencies
 - An active and organized citizenry, usually exemplified by the operation of a Citizens Advisory Committee

4. **Coordinators.** Bicycle and pedestrian coordinators are essential to the institutionalization of bicycling and walking. Every metropolitan area, city and county should have a coordinator, just as the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) now requires every State to have such a position.

Coordinators, or program managers, can initiate and pursue the many opportunities for institutionalization—such as training, policy, and plan review, and manual writing—better than anyone else as they are working from the inside of an agency, rather than the outside.

5. **Supportive Professionals.** At the very heart of institutionalization lies the need to educate, encourage, and train every traffic engineer and planner to automatically incorporate bicycle- and pedestrian-friendly design features and requirements into all that they do. Ultimately, separate bicycle and pedestrian coordinators may not be necessary—but until that time, they are needed to carry out the training, education, and encouragement required.
6. Training is an especially important part of this process. Traffic engineers and planners often graduate with little or no information or experience on how to deal with design questions relating to bicyclists and pedestrians. A whole generation of engineers and planners grew up believing bicycles were toys and walking would soon be an anachronism—and these attitudes can be hard to break.

Training is also available and applicable for coordinators and advocates alike.

7. **Advocates.** Citizen participation and advocacy have been and will remain an essential part of institutionalization. In addition to initiating and sustaining bicycle and pedestrian programs, advocates have a unique role to play in normalizing bicycling in the eyes of the public and public agencies. This may be achieved through legislative efforts, event promotion, participation in citizen's advisory committees, and the development of a constructive working relationship with public agencies.
8. The advocates' role has been significantly enhanced in the new planning process created by the ISTEA, where public involvement in the process has been

guaranteed. This is an important step in the democratization of transportation policy-making and planning—and one where bicycle advocates in particular may be well equipped to make an impact due to their prior involvement in the process.

9. ISTEA and the Clean Air Act Amendments of 1991 make the planning process more important than ever. To obtain funding, and to secure implementation, bicycle and pedestrian projects must be included in State and MPO short- and long-range transportation planning documents.
10. ISTEA does not conclusively answer the debate about the desirability of having a separate chapter or plan for bicycle and pedestrian facilities versus trying to integrate bicycle and pedestrian consideration throughout the long- and short-range plans. Experience from a variety of State and local government agencies suggests the answer will vary from case to case.

For a city or State just starting to deal with bicycling and walking after 30 years of neglect, the best approach is to develop separate documents with overall policy goals and recommendations, goals and strategies, and to gradually work towards the adoption and implementation of the various policies and actions by the appropriate Government agencies.

For a State or city with years of experience and background, it should become possible to integrate the needs and provisions for bicyclists and pedestrians into the overall goals of the State or local agency.

11. Implementation of the policies and plans is one of the few indicators of success. Plans and policies should, therefore, set performance goals to be met, and should outline the strategies necessary to meet those goals. For example, a city might set an overall target of increasing bicycle use by 50 percent over 20 years. To achieve this goal will require every street to be bicycle-friendly, and to achieve that will require a change to the city's street design manual to require every street to be designed, resurfaced, and restriped to include a 5-foot bike lane.

Identification and implementation of the steps necessary to turn plans and policies into actions are two major challenges facing the bicycle and pedestrian community over the next 20 years.

12. All the elements of a successful bicycle program—from facilities and maintenance to education and safety programs—can be seen somewhere in the United States. There is not any single place where all the elements have been brought together. This might be the subject of a future demonstration project to be undertaken and financed by the Federal Government.
13. The same cannot be said of pedestrian programs. While much is now being done to develop pedestrian programs and pedestrian activities—especially in Florida—not all the elements of a successful program have been tried and tested in the U.S. In

particular, pedestrian programs frequently leave out “encouragement” from the list of activities in which they engage.

14. As a result, there is a danger that pedestrian-related issues will take a back seat to bicycle issues where the two are combined in one program staff position.
15. The development of bicycle programs over the last 20 years may be a useful model for pedestrian programs to follow—and also for emerging technologies such as telecommuting.
16. Success breeds success. Cities such as Seattle, WA; Portland, OR; Palo Alto, CA; and Tucson, AZ; and States such as Florida, North Carolina, and Minnesota have remained at the forefront of bicycle and pedestrian program activities for many years as the success of the programs generates better conditions, more interest, more bicycling and walking, and greater support for future activities.

References

1. Lagerwey, *Institutionalizing Bicycling in the Transportation Planning Process*, Pro Bike Conference Proceedings, Sept. 1990.
2. U.S. Department of Transportation, *Moving America: New Directions, New Opportunities*, Feb. 1990.
3. Federal Highway Administration (FHWA), *Bicycle and Pedestrian Facilities in the Federal-Aid Highway Program*, Sept. 1990.
4. Larson, *To the Other Side of the Mountain*, FHWA, Sept. 1990
5. 1990 and 1991 U.S. Department of Transportation Appropriations Acts.
6. FHWA, *Policy on Bicycle and Pedestrian Projects*, May 7, 1991. Memorandum to Regional Highway Administrators.
7. FHWA, *Simplified Procedures for Bicycle and Pedestrian Projects*, Aug. 7, 1991. Memorandum to Regional Highway Administrators.
8. Federal Register, *Highway Safety Programs, Determination of Effectiveness*, Fri. Oct. 4, 1991, Vol. 56 #93 p. 50250.
9. The Intermodal Surface Transportation Efficiency Act of 1991. PL-102-240.
10. Bicycle Federation of America, *Pro Bike News*, Vol. 12/1 and 12/6.
11. FHWA, *Designation of Bicycle and Pedestrian Coordinators Within State Departments of Transportation*, Jan. 28, 1992. Memorandum to Regional Highway Administrators.
12. Clarke, *Bicycle Friendly Cities: Key Ingredients for Success*, Paper presented to Transportation Research Board Conferences 1992.
13. See Case Studies 22 and 23.
14. FHWA, *Interim Guidance on the ISTEA Metropolitan Planning Requirements*, April 6, 1992. Memorandum to Regional Highway Administrators.
15. FHWA, *Interim Guidance—23 U.S.C. 135—Statewide Planning Requirements*, May 28, 1992. Memorandum to Regional Highway Administrators.

16. League of American Wheelmen, *How to Succeed at Bicycle Advocacy*, 1990.
17. North Carolina Department of Transportation, *From Need to Bicycle Improvement: The Transportation Improvement Process*, Undated.
18. Yates, *Personal Communication*, March 24, 1992.
19. Section 135 (e), 23 U.S.C.
20. New Jersey Department of Transportation, Request for Proposal, issued June 1992.
21. Minnesota Department of Transportation, *Plan B: The Comprehensive State Bicycle Plan*, Feb. 1992.
22. Minnesota Department of Transportation, *State Bicycle Transportation System Plan*, 1987.
23. Colorado Department of Transportation, *Statewide Improvements for Transportation*, Sept. 1991.
24. Oregon Land Conservation and Development Commission, Transportation Planning Rule 660-12, April 26, 1991.
25. Oregon Department of Transportation, Draft Transportation Plan, Nov. 1991.
26. Oregon Department of Transportation, *Bicycle Master Plan*, May, 1988.
27. Delaware Department of Transportation, *Strategies for a Statewide Bicycle/Pedestrian Plan*, Dec. 1991.
28. Florida Department of Transportation, *Roadway Plans Preparation Manual*, 1989.
29. Florida Department of Transportation, *The Florida Bicycle Program Aluminum Anniversary Progress Report*, Nov. 1, 1989.
30. Florida Department of Transportation, *Florida Pedestrian Safety Plan*, Feb. 1992.
31. Washington Metropolitan Council of Governments, *The Bicycle Element of the Long-Range Transportation Plan for the National Capital Region*, Nov. 1991.
32. City of Dallas, *Dallas Bike Plan*, 1985.
33. Bicycling Magazine, *10 Best Cities for Bicycling*, April 1990.
34. Seattle Engineering Department, *Pedestrian and Bicycle Program: 1992 Work Program*, 1992.
35. City of San Jose, Personal communication with staff, Sept. 1991.

36. City of San Jose, *Comprehensive Bicycle Master Plan Goals and Objectives*, Sept. 1991.
37. City of Phoenix, *Phoenix 2015: Phoenix Futures Forum Report*, Jan. 1990. See also the Technical Supplement.
38. Borough of Manhattan, *Planning for Pedestrians: A Comprehensive Approach*, 1989.
39. Urban Transportation Monitor, *Boston Takes Comprehensive Approach to Reduce Pedestrian Fatalities*, April 17, 1992.
40. Ryan Snyder Associates, *Los Angeles Becomes the First Major City to Require Bicycle Amenities in Buildings*, Nov. 7, 1991.
41. Northeastern Illinois Planning Commission, *Development Guidelines That Promote Bicycle Use*, Aug. 1990.
42. Northeastern Illinois Planning Commission, *Development Guidelines That Promote Pedestrian Access and Safety*, Aug. 1990.
43. City of Tucson Planning Dept., *Development Standard # 2-08.0 Relating to Pedestrian Access*, Sept. 24, 1990.
44. AASHTO, *Policy on Geometric Design of Streets and Highways*, 1990.
45. California Department of Transportation, *Highway Design Manual Chapter 1000*, 1987.
46. Washington Department of Transportation, *Facilities for Nonmotorized Transportation, Design Manual Section 1020*, 1989.
47. New York Department of Transportation, *Highway Design Manual Revision #18*, 1986.
48. Arizona Governors Bicycle Task Force, *Arizona Bicycle Facilities Planning and Design Guidelines*, 1988.
49. North Carolina Department of Transportation, *Draft Bicycle Facilities Manual*, 1991.
50. Minnesota Department of Transportation, *Bikeway Design Manual*, Feb. 8, 1982.
51. Florida Department of Transportation, *Bicycle Facilities Planning and Design Manual*, 1982.
52. New Jersey Department of Transportation, *Bicycle Compatible Roadways—Planning and Design Guidelines*, 1982.

53. Wisconsin Department of Transportation, *Feasibility of Paving Shoulders on Low ADT Highways*, 1986.
54. Florida Department of Transportation, *Policy for Incorporation of Bicycle Facilities in Design—Wide Curb Lanes, Bicycle Lanes and Paved Shoulders*, 1984.
55. AASHTO, *Guide to the Development of Bicycle Facilities*, Aug. 1991.
56. City of Tucson, *Major Streets and Routes Plan*, 1985.
57. City of Orlando, *Growth Management Plan, Traffic Circulation Element (Objectives 2.3 and 2.4)*, Undated.
58. Seattle Engineering Department, *Crosswalk Policies et al.*, 1992. Reported in *Pro Bike News*, July 1992.
59. Bicycle Federation of America, *Bicycle Program Specialist Survey: 1990*, Sept. 1990.
60. Bicycle Federation of America, *Pro Bike News*, December 1991.
61. American Society of Civil Engineers, *Results of ASCE Human Powered Transportation College Education Questionnaire*, May, 1991.
62. Clean Air Act, as amended, Section 108.
63. Pierce Transit, *Nonmotorized Travel Facilities Integration Project: Summary and Recommendations*, June 1991.
64. Palo Alto City Council, *Identification of Traffic Signal Detection Loops*, Staff Report, May 28, 1991.
65. Denver Department of Public Works, *Draft Construction Detour Standards for Bikeways and Multi-use Trails*, May 1992.
66. Oregon Bikeway Specialist, personal communication, 1992.
67. Minnesota Bicycle Coordinator, personal communication, 1992.
68. Oregon Department of Transportation, *Bicycle Bill Twentieth Anniversary News Information Packet*, May 17, 1991.
69. Texas Bicycle Coalition, *Bicyclists Empowered*, Paper to be presented at Velo Mondiale Conference, Sept. 1992.
70. City of Chicago, *The Bike 2000 Plan*, May 1992.
71. City of Eugene, *Bicycles in Cities: The Eugene Experience*, 1981.

72. Bicycle Federation of America, *Bicycle Coordinators and Program Specialists*, 1990.
73. Bicycle Federation of America, *Orlando: From Worst to First*, *Pro Bike News*, March 1992.
74. Arizona Governor's Bicycle Task Force, *Arizona Bicycle Reference Guide*, May 1992.
75. Bicycle Federation of America, *City Watch Launched in Asheville, N.C.*, *Pro Bike News*, July 1992.
76. Bicycle Federation of America, *Information on Bicycling Communities*, undated.
77. *The Washington Post*, Metro Section, July 3, 1992.
78. Bicycle Federation of America, *Paramedics Follow Cops Onto Bikes*, *Pro Bike News*, Nov. 1991.
79. City of Palo Alto, *Bicycle Mileage Reimbursement Policy*, Rev. 1982.
80. Cyclists Touring Club (UK), *What Price Cycling?: A Guide to Cycling Mileage Allowances*, Information Sheet A 17.
81. Personal communications with bicycle coordinators in Seattle and King County.
82. Diane Twede, personal communication, July 7, 1992.
83. Metropolitan Transportation Commission, *Bicycling and Walking*, from the National Conference on Strategies to Alleviate Traffic Congestion, undated.
84. City of Glendale, entry to Bicycle Action Awards run by the Bicycle Federation of America, May 1991.
85. Fleetwood Enterprises, *Mud, Sweat, and Gears*, personal communication, 1991.
86. Urban Transportation Monitor, April 17, 1990.
87. City of Boulder, *Rough Outline of 1991 Workplan*, Memorandum to Bob Whitson, Jan. 7, 1991.
88. Hillman, *The Role of Walking and Cycling in Transport Policy*, Policy Studies Institute and Rees Jeffreys Road Fund, Jan. 1990.
89. FHWA, *Feasibility of Demand Incentives for Nonmotorized Transportation*, 1981.

Madison's Bicycle Parking Ordinance

by Arthur Ross, Bicycle Coordinator

Background

On March 1, 1988 the Madison, Wisconsin, City Council passed an ordinance requiring developers to provide safe and convenient off-street bicycle parking. Although this is not a new idea (similar ordinances have been in place in some other cities for at least ten years) there are still only a handful of cities with comprehensive bicycle parking ordinances.

A bicycle parking ordinance is an integral part of comprehensive bicycle planning. It's not enough to develop and maintain a bicycle-friendly road system. People can't be expected to use their bicycles for transportation unless secure bicycle parking facilities exist at their destinations. This benefits not only current bicyclists, but can also encourage others to use bicycles for transportation. Safe bicycle parking facilities can also help reduce bicycle thefts.

Land Use & Occupancy

Madison's ordinance requires bicycle parking only for new developments or for changes in use, expansions and other types of remodeling that would increase the required level of parking. For changes in use, etc., only the additional amount of parking that would be required by the change needs to be provided. This is consistent with the applicability of automobile parking requirements in Madison.

In theory, it would be desirable to require existing uses to provide bicycle parking after a certain period of time. This would insure that, at some not too distant point in time, bicycle parking facilities would be provided almost everywhere. In practice, however, this is infeasible. None of the ordinances reviewed has this type of provision. Hopefully, existing businesses, office buildings and apartments can be persuaded that it is to their advantage to provide bicycle parking.

Bicycle parking is required for all types of developments in Madison. There are no explicit exceptions, although the Zoning Administrator has some discretion in determining the number of spaces required. Some other cities do exempt various uses from providing bicycle parking facilities. For example, Palo Alto, CA, exempts warehousing and distribution, automobile services, day care centers and mortuaries. Austin, TX, exempts agricultural uses, pet services, campgrounds and airports.

Madison chose not to grant these types of exceptions outright. While these uses are good examples of services for which few people use bicycles to do business, their employees may still choose to bicycle to work. The intention in Madison is to at least provide bicycle parking for employees of these types of uses.

Finally, bicycle parking is required in all areas of Madison. This is significant for two reasons. First, automobile parking is not required in what is called the Central Area. This is designed to discourage automobile use downtown. Since automobile use is being discouraged, it makes sense to encourage the use of other transportation modes. Providing bicycle parking in this area encourages bicycle use.

The question was raised at a public hearing whether bicycle parking should be required in areas which some people feel are inaccessible by bicycle due to the lack of nearby bike paths or signed bike routes.

It was decided that these areas should not be exempted from providing bicycle parking for several reasons: it would be difficult to come up with a consistent definition of non-bicycle accessible areas; it is the policy of the City of Madison to make the entire city bicycle accessible; to exempt areas now would mean not having bicycle parking available when an area was deemed bicycle accessible.

As a concession to this concern, a clause was borrowed from Palo Alto's ordinance allowing for the deferral of up to half the required bicycle parking when the need for bicycle parking is uncertain. Land required for deferred bicycle parking must be kept in reserve.

Parking Requirements

Automobile and bicycle parking requirements are based on the expected number of residents, employees, shoppers, clients, visitors, and/or person capacity for the various uses. Since automobile parking requirements are well established, bicycle parking requirements are often expressed as a percentage of the automobile requirement. These percentages should be based on estimates of bicycle ownership and usage. Surveys in Madison have shown that there are more bicycles than cars in the city; 11% of work trips are made by bicycle; 30% of university students living off-campus and 20% of those living on-campus commute by bicycle; 5% of

elementary school students, 17% of middle school students, and 12% of high school students commute by bike.

Madison's bicycle parking requirements are 10% of automobile parking requirements with the exception of multifamily residential uses and schools. See Table 1 for a comparison of several cities' bicycle parking requirements.

A minimum of two bicycle spaces is required in Madison, to ensure that some bicycle parking is always provided, even for small developments.

At the other end of the spectrum, concern was raised about the impact of this ordinance on large developments. The larger shopping malls in Madison, for example, may have 5,000 automobile parking spaces. Thus, 500 bicycle parking spaces would need to be provided if a similar project were built today.

Some people felt this would be an excessive amount of bicycle parking. In response to this concern, Madison followed the lead of Boulder, Colorado. Beyond the first 50 bicycle parking spaces provided (500 auto spaces), they cut the requirement in half. Thus the shopping mall with 5,000 automobile spaces would need 275 bicycle spaces instead of 500.

Parking Location

There are two general locational criteria for bicycle parking facilities: (1) they should be in visible, well-lit areas to help deter theft; and (2) they should be in a convenient location in relation to the bicyclist's destination, usually close to a building entrance. Additionally, bicycle parking should not interfere with pedestrian traffic, and should be protected from potential damage by motor vehicle traffic.

Reference to the relative convenience of bicycle versus automobile parking is common in bicycle parking ordinances. Madison's ordinance requires that "... Bicycle parking facilities shall be located in a clearly designated safe and convenient location. ... The facility location shall be at least as convenient as the majority of auto parking spaces provided. ..."

The intent is to ensure that the convenience factor in using a bicycle for transportation is not diluted by placing racks in the far corner of the parking lot or out back by the dumpster.

Design standards

Two design standards are included in most bicycle parking ordinances. First, the size of a bicycle parking space is specified. This is almost universally 2 feet by 6 feet. Second, restrictions on the type of bicycle

Comparison of Bicycle Parking Ordinances

City	M-F Res. ¹	H/mot. ²	Schools	Comrci.	Retail	Mfg.	Recreation	Exemptions	Notes
Austin, TX:	None	1% ³	5%	5%	5%	5%	5%	Ag. uses, pet srvcs., auto svc., campgrnds., resource extraction, airports, equip. sales & svc., funeral, cemetery.	
Boulder, CO:	10%	10%	10%	10%	10%	10%	10%		Min. of 3 spaces; reduced to 5% after 50 bike spaces provided.
Eugene, OR:	1-2/unit	10%	10%	10%	10%	10%	10%	Drive-in theatres, horticulture, mineral res. mining & recovery.	Covered parking often req'd.
Gainesville, FL:	10-25%	10%	k-6: 300%; 7-9: 200%; 10-12: 100%; other: 10-20%	5%	10%	5%	5-25%	Auto wrecking, junk yards & salvage yards; part of Central City Dist. (CCD).	10% for all uses in shopping ctr dists. & non-exempt sections of CCD.; 15% for all uses in n'hood. shopping dists.
Madison, WI:	1/unit	1/20 emp. ⁴	K-6: 1/10 employees + students; 7-college: 1/4 emp. + students	10%	10%	10%	10%		Min. of 2 spaces; reduced by half after first 50 spaces provided; allows deferral up to 1/2 of requirement.
Palo Alto, CA:	1/unit	10%	K-8: 1/3 students; 9-12: 1/2 students.	10%	10%	10%	30%	Single + 2-fam. res.; warehousing & dist. mortuaries; auto srvcs.; day care ctrs.; drive-up windows.	Allows deferral of up to 1/2 requirement.
Portland, OR:	high dens. only; 1/5 units	5%; min: 5	K-12: 1/10 students; college: 10%	5%; min.: 5 limited & n'hood: min.: 3	5%; min.: 5	5%; min.: 5; some uses: min.: 2	5%; min.: 10	Cemeteries; billboards.	If 10+ spaces req'd., 50% must be covered.

Notes: 1: M-F Res.: Multi-Family Residential; 2: H/Mot.: Hotels/Motels; 3: All percentages refer to percentage of auto parking; 4: 1/20 emp: one space per 20 employees.

racks are often imposed.

Two rack restrictions are common. One attempts to classify racks into three types on the basis of the level of security provided. In this classification scheme, Type I facilities include lockers and enclosed, locked, limited access areas. These are the most secure, protecting not only the bicycle frame and wheels, but also components and accessories from theft and, usually, weather.

Type II racks allow the frame and both wheels to be locked with the bicyclist supplying only a padlock. This is accomplished by either designing the rack with moving parts that

prevent the removal of the wheels when locked, or by providing a six foot cable attached to the rack. Type III racks are any stationary object to which a bicycle and both its wheels can be locked with the user supplying both a lock and six foot cable.

The difference between Type II and III racks is often more of convenience than security. Type II is considered more convenient since the bicyclist needs carry only a padlock, a cable is provided with the rack.

The other common rack restriction requires that racks be able to accommodate the increasingly popular U-shaped high security locks. Users of

these locks find many of the Type II and III racks inadequate if they do not allow full use of these locks. While many U-shaped lock users do not remove their front wheel, most do lock a wheel and the frame. They feel uncomfortable if they can only lock the frame or a wheel to a bike rack, and will look around for someplace else to lock their bicycles more effectively.

With either type of rack restriction, there is often a further requirement that racks support the bicycle in a stable position without damage to the wheels, frame or components. This wording is designed to exclude many of the "traditional" bicycle rack designs that offer inadequate support to the bicycle, which can lead to damage.

Without getting into a debate over which racks are best (that was issue 18's Quarterly Question), the type of bicycle parking facilities provided can be an important determinate of the effectiveness of the bicycle parking ordinance.

The question raised in Madison was: "How will this ordinance ensure that the bicycle racks will be used, as opposed to having bicycles locked to trees, parking meters and sign posts while a nearby rack sits empty?" Obviously, this cannot be guaranteed unless you also make it illegal to park

Comparison of Rack Specifications

Austin, TX: Type I, II, III system, with type specified for each use. For example: transit terminals: half at least Type II with the remaining half at least Type I; general retail services: at least Type II; consumer convenience services: one half at least Type II with the remaining half at least Type III.

Boulder, CO: Lockers or medium security racks in which both the bicycle frame and wheels may be locked by user.

Eugene, OR: Locking shall be provided for all required spaces (Type III).

Gainesville, FL: All required bicycle parking facilities shall be from an approved list of bicycle parking devices maintained by the Department of Community Development. Other bicycle parking devices may be used if it can be established to the satisfaction of the Building Official that they are equivalent to any devices on the approved list in function, quality, and construction.

Madison, WI: Structures that require a user-supplied locking device shall be designed to accommodate U-shaped locking devices.

Palo Alto, CA: Type I, II, III system. Type I includes lockers, check-in systems, monitored and restricted access parking. Type is specified for each use. For example, multi-family residential use: Type I; retail: Type II, covered; schools: Type III, enclosed.

Portland, OR: Bicycle racks shall accommodate: (i) Locking the frame and both wheels to the rack with a high-security U-shaped shackle lock, if the bicyclist removes the front wheel; and (ii) Locking the frame and one wheel to the rack with a high-security U-shaped shackle lock, if the bicyclist leaves both wheels on the bicycle; and (iii) Locking the frame and both wheels to the rack with a chain or cable not longer than 6 feet without removal of the front wheel.

anywhere except in a bike rack combined with overzealous enforcement. On the other hand, if the ordinance is clearly written, ensuring the installation of racks which are properly designed and sited, the racks will be used. Table II (see previous page) compares bike rack specifications for various cities.

Maintenance

Two types of maintenance are of concern with bicycle parking facilities: maintenance of the parking structure, and of the surface the rack and bicycle sit on. Most ordinances require that the surface of bicycle parking facilities be designed and maintained to be mud and dust free. In areas

where it snows, racks should be kept free of snow and available for use.

The more moving parts a rack has, including chains or cables, the more likely maintenance will be needed. Some racks now have plastic or rubber coverings or strips to protect the bicycle's paint from chipping.

These may require periodic replacement. Painted racks can be chipped and scratched, requiring touch-up or re-painting. Lockers may also need periodic painting, and should be checked to ensure they remain weather tight.

Conclusion

Few questions about the need for this ordinance were raised during the

passage process. Rather, most questions concerned implementation and the recommended guidelines. I expect Madison's ordinance will need some fine tuning as we gain experience with its implementation.

The bottom line of any ordinance is how well it works in practice. Things to look for with a bicycle parking ordinance include whether the desired types of bike racks are being installed in appropriate locations, and whether the racks are being used.

The author is Pedestrian/Bicycle Coordinator for the City of Madison, Wisconsin. Before taking the position, he worked with the Bicycle Program of the City of Boulder, Colorado.

Changes to Madison's Parking Ordinance

"1. Subsection (1) entitled 'Statement of Purpose' of Section 28.11 entitled 'Off-Street Parking and Loading Facilities' of the Madison General Ordinances is hereby amended to read as follows:

"(1) Statement of Purpose. The purpose of this section is to provide for the regulation of accessory off-street parking and loading facilities for different uses. The regulations and requirements which follow are established to promote the safety and general welfare of the community by:

"(a) Increasing the safety and capacity of public streets by requiring off-street parking or off-street loading facilities to be provided.

"(b) Minimizing adverse effects of off-street parking and off-street loading facilities on adjacent properties through the requirement of design and maintenance standards.

"(c) Lessening congestion and preventing the overtaking of public streets by regulating the location and capacity of accessory off-street parking or off-street loading facilities.

"(d) Providing adequate and safe facilities for the storage of bicycles.

"2. Paragraph 4. of Subsection (2) entitled 'General Regulations' of Section 28.11 entitled 'Off-Street Parking and Loading Facilities' of the Madison General Ordinances is hereby created to read as follows:

"4. Bicycle parking facilities shall be provided as required for all new structures and uses established as provided in Sec. 28.11(2)(a)1. or to changes in uses as provided in Secs. 28.11(2)(a)2. and 3.; however, bicycle parking facilities shall not be required until the effective date of this paragraph. Notwithstanding Secs. 28.08(1)(i) and 28.09(5)(a), bicycle parking facilities shall be provided in all districts including districts in the Central Area."

"3. Paragraph 1. of Subdivision (a) entitled 'Utilization' of Subsection (3) entitled 'Off-Street Parking Facilities' of Section

28.11 of the Madison General Ordinances is hereby amended to read as follows:

"1. In the residential district, accessory off-street parking facilities provided for uses listed herein shall be solely for the parking of passenger automobiles and bicycles of patrons, occupants or employees and not more than one truck limited to one (1) ton capacity."

"4. Subdivision (e) entitled 'Size' of Subsection (3) entitled 'Off-Street Parking Facilities' of Section 28.11 of the Madison General Ordinances is hereby amended to read as follows:

"(e) Size. Off-street parking spaces shall comply with the mini-

mum width, length and access requirements as specified in Sec. 10.08 of the Madison General Ordinances. Required bicycle parking spaces shall be at least 2 feet by 6 feet. An access aisle of at least 5 feet shall be provided in each bicycle parking facility. Such space shall have a vertical clearance of at least 6 feet."

"5. Subparagraph d. of Paragraph 2. of Subdivision (h) entitled 'Design and Maintenance' of Subsection (3) entitled 'Off-Street Parking Facilities' of Section 28.11 of the Madison General Ordinances is hereby created to read as follows:

"d. Bicycle Parking Facilities. Accessory off-street parking for bicycles shall include provision for secure storage of bicycles.

Such facilities shall provide lockable enclosed lockers or racks or equivalent structures in or upon which the bicycle may be locked by the user. Structures that require a user-supplied locking device shall be designed to accommodate U-shaped locking devices. All lockers and racks must be securely anchored to the ground or the building structure to prevent the racks and lockers from being removed from the location. The surfacing of such facilities shall be designed and maintained to be mud and dust free."

"6. Paragraph 3. of Subdivision (i) entitled 'Location' of Subsection (3) entitled 'Off-Street Parking Facilities' of Section 28.11 of the Madison General Ordinances is hereby created to read as follows:

"3. Bicycle parking facilities shall be located in a clearly designated safe and convenient location. The design and location of such facility shall be harmonious with the surrounding environment. The facility location shall be at least as convenient as the majority of auto parking spaces provided."

"7. New paragraph 1. of Subdivision (1) entitled 'Schedule of Required Off-Street Parking Facilities' of Subsection (3) of Section 28.11 entitled 'Off-Street Parking Facilities' of the Madison General Ordinances is hereby created to read as follows:

"1. Bicycle parking facility spaces shall be provided in adequate number as determined by the Zoning Administrator. In making the determination, the Zoning Administrator shall consider when appropriate, the number of dwelling units or lodging rooms, the number of students, the number of employees, and the number of auto parking spaces in accordance with the following guidelines (see chart at left)."

"8. Current Paragraphs 1., 2., 3., 4., 5. and 6. of Subdivision (1) entitled 'Schedule of Required Off-Street Parking Facilities' of Subsection (3) of Section 28.11 entitled 'Off-Street Parking and Loading Facilities' of the Madison General Ordinances are hereby renumbered to Paragraphs 2., 3., 4., 5., 6. and 7."

Off-Street Bicycle Parking Guidelines

Land Use	Bike Space
Dwellings/lodging rooms	1 per dwelling unit or 3
lodging rooms	
Clubs/lodges	1 per lodging room plus 3% of person capacity
Fraternities/sororities	1 per 3 rooms
Hotels/lodging houses	1 per 20 employees
Galleries/museums/libraries	1 per 10 auto spaces
Colleges/universities/junior and high schools	1 per 4 employees plus 1 per 4 students
Nursery/elementary schools	1 per 10 employees plus students above second grade
Convalescent and nursing homes/institutions	1 per 20 employees
Hospitals	1 per 20 employees
Places of assembly, recreation, entertainment and amusement	1 per 10 auto spaces
Commercial/manufacturing	1 per 10 auto spaces
Miscellaneous/other	To be determined by the Zoning Administrator based on the guideline for the most similar use listed above

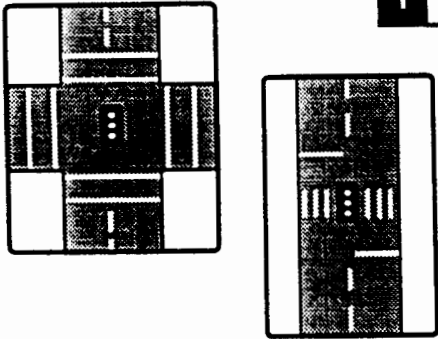
"a. In all cases where bicycle parking is required, no fewer than two (2) spaces shall be required.

"b. After the first fifty (50) bicycle parking spaces are provided, additional bicycle parking spaces required are 0.5 (one half) space per unit listed.

"c. Where the expected need for bicycle parking for a particular use is uncertain due to unknown or unusual operating characteristics of the use, the Zoning Administrator may authorize that construction and provision of not more than fifty (50) percent of the bicycle parking spaces be deferred. Land area required for provision of deferred bicycle parking spaces shall be maintained in reserve."

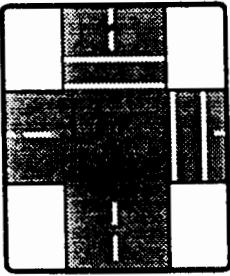
SED Policy on Marked Crosswalks (1992)

Resolution 25717 states: "Marked pedestrian crosswalks will be used only to delineate preferred pedestrian paths across roadways under the following conditions."



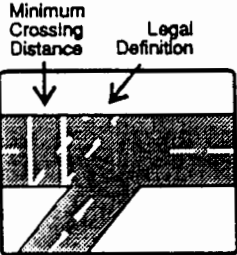
1 Signalized Locations (Intersections and Midblock)

- Serves primarily to guide pedestrians in the proper path and provide motorists with a stopping point.



2 School Walking Route

- Required by state law.
- Location of crosswalks reflect recommended walking routes as determined by SED and affected schools on arterial and non-arterial streets within the walking route boundary of the school.



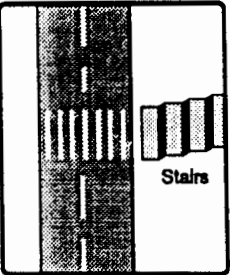
3 Non-signalized Locations (Determined by engineering judgement)

Intersections:

- Provide a crossing location that minimizes the distance and reduces the length of time the pedestrian is in the street as compared to the legally defined crosswalk.
- Encourage the pedestrian to utilize a crossing location that provides better sight distance between pedestrian and motorist or other safety considerations.

Mid-block

- Establish a legal crosswalk - at stairways, walkways or other places of unexpected entry into the street. Installed as a ladder-type crosswalk.



Rationale for current policy to not mark crosswalks at typical intersections:

- Eliminates "false sense of security"; i.e., the false expectation that drivers will stop.
- Reduction in pedestrian accidents.
- Law requires motorists to stop for pedestrians regardless if they are in marked or unmarked crosswalks.

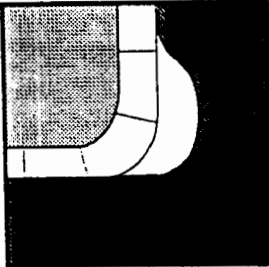
Issues for current policy:

- Refuse more than 90 percent of citizens' requests for marked crosswalks; other traffic control devices are considered for resolution of requests.
- Policy does not reflect pedestrian volumes, street classification, speeds or street width. These factors are considered within engineering judgement.
- Reduction in pedestrian accidents may also be attributed to other factors; e.g. demographics, education, etc.
- Crosswalks clearly identify a pedestrian place in the street.

SED Policy/Budget Considerations On Pedestrian-Related Design

(1992)

Curb Bulbs

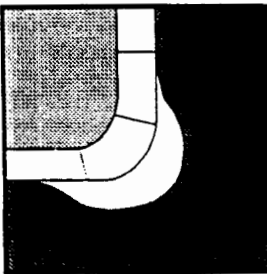


Advantages:

- Shortens the crossing distance and reduces the exposure time pedestrians are in the roadway.
- May eliminate the multiple-threat accident potential.
- Provides the pedestrian with a better view of approaching traffic and allows the pedestrian to clearly indicate their crossing desire.
- Provides the motorist with a better view of pedestrian and thus a greater opportunity to stop.
- Enforcement of crosswalk legislation is more easily facilitated.
- If designed with new roadway construction, cost savings due to minimum pavement thickness for parking lane.

Disadvantages:

- Limits curb lane to parking only; i.e., cannot be used as temporary driving lane with temporary elimination of parking or cannot eliminate parking to accommodate an additional traffic lane or striped four-five foot bicycle lane.
- High cost; especially when retro-fitting; design should be aesthetically pleasing for pedestrian-friendly environment; and design may require drainage inlet relocation.



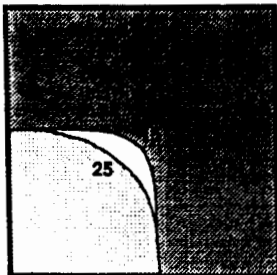
Issues:

- Curb bulbs are too often overlooked when opportunities are available for installation; e.g., condition developments.

Goals:

- Institutionalize curb bulbs so they will be considered for all projects by DCLU and Plan Review.
- Develop a curb bulb program and a budget to target problem crossing locations.

Curb Radius



- The current Seattle Street Improvement Manual design standard for an arterial to arterial curb radius is 25' - if large number of truck or bus turns the design standard is 30'.
- The Seattle CBD at one time had 9' curb radii and the arterial to arterial standard was 15'.

Rational for increasing curb radii:

- Curb radii have been increased over the years to accommodate longer truck and bus lengths and thus reduce the likelihood of trucks/buses running over the curb and striking pedestrians standing on the corner; and to increase capacity by facilitating rapid right turn movements.


Issues:


- Increased curb radii facilitate rapid right turns: often motorists execute a "California Stop" looking to their left for a gap in traffic and do not look for pedestrians that may be stepping off the curb to their right.
- Increased curb radii increases the pedestrian's crossing distance and exposure time they are in the street.
- The additional vehicle space was previously pedestrian space on the corner - may create a pedestrian unfriendly area.


Goals:

- Incorporate curb bulbs at locations where curb radii are increased for pedestrian visibility and safety.
- Expand the current limit on large truck access to certain streets and hours and incorporate reduced street standards into design.
- Prevent further increases in truck lengths.

SED Policy on Pedestrian Crossing Warning Signs (1992)

a. 

b. 


c. 


School Crossing Signs


Application/Installation based on state law.


- a. Required in advance of all marked school crosswalks.
- b. Required in advance of marked school crosswalks with a student patrol - in Seattle always posted in conjunction with sign 'a.'
- c. Required at all marked school crosswalks.


SED installs school crossing warning signs at school half signals; i.e., pedestrian signals.


a. 


b. 

c. 

g. 
(overhead)

d. 

e. 

f. 

Pedestrian Crossing Signs

Application/Installation based on engineering judgement.

- a. Placed in advance of crosswalk location.
- b. Placed at crosswalk location.
- c/f. Citizen input - used in conjunction with signs 'a' or 'b'.
- d. Citizen input - signalized intersection; high turn conflict.
- e. Citizen input - exit from pedestrian restricted facility; for example, an exit ramp from Interstate 5.
- g. Overhead sign at mid-block marked crosswalks. May be used where street width, parked vehicles, street trees, curves or hills may restrict motorists' vision of crossing location.

Rationale for current policy on pedestrian crossing signs:

- Responsive to citizen's concerns.
- May increase motorists' awareness of pedestrians.
- An alternative to other requests such as marking a crosswalk.
- Low cost.

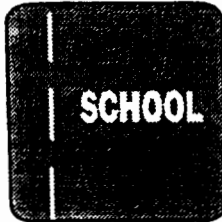
Issues for current policy on pedestrian crossing signs:

- Limited benefit - lack of correlation between sign installation and added safety benefit in crossing major arterials without other controls.
- Signs may be visible upon initial installation; however, they generally become roadway 'noise' after motorists drive by without seeing pedestrians.
- Proliferation of warning signs breeds disrespect and reduces benefit.

SED Policy/Budget Considerations on Pedestrian Safety (1992)

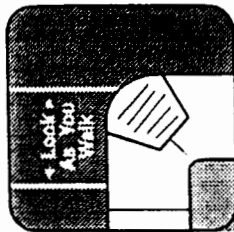
Awareness (Bridging the Gap between Engineering and Education)

Current/Past Practice



"School" Legend

- Pavement marking was a Federally-funded demonstration project in the early 70's. Was considered experimental and never adopted for universal use.
- Legend was marked on about 20 arterials in advance of public elementary school crosswalks.
- Legend is currently not maintained except on a request basis.
- **Goal:** Conduct search for an evaluation of demonstration project. Develop criteria for installation/maintenance.



"Look As You Walk" Legend

- Legend developed by SED in early 80's as a demonstration project.
- Painted at all marked and unmarked crosswalks along a high pedestrian corridor; e.g., NE 45th St.
- Legends applied for this demonstration project are not maintained.
- Currently legend selectively installed.
- **Goal:** Evaluate impact of original installation. Develop criteria for installation/maintenance.

"Last Thing" Brochure

- Continue working with Harborview Injury Prevention and Research Center.
- **Goal:** Secure funding for reproduction and distribution of brochures to promote pedestrian safety.

Future Steps



"Stop for Me" Sign

- Sign developed by SED aimed at educating/reminding motorists of 1990 crosswalk legislation - citizen responsive.
- Sign to be installed at locations where crosswalk or pedestrian crossing signs are not appropriate; sign designed to be relocated after four to six weeks to another location; coordinated with SPD for additional enforcement.
- **Goal:** Obtain approval of design and application of sign; install signs at four locations.

Pedestrian "Hero" Program

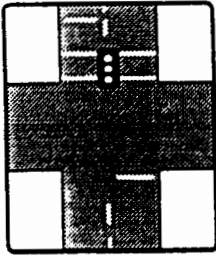
- SED implement and support a program aimed at providing the pedestrian an active role in response to motorists violating the crosswalk legislation and educating the motorist about the crosswalk laws.
- **How:** Pedestrian provides SED with the license number of the vehicle, plus a date, time, location and description of the vehicle; SED educates vehicle owner by mail about pedestrian safety and the crosswalk legislation.
- **Goal:** Evaluate feasibility of program (would pedestrian be able to get accurate license number and description of vehicle and would the Department of Licensing cooperate by providing the mailing addresses); develop cost estimate for staff time, materials and mailing; implement the program with appropriate publicity.

SED Policy

On Other Pedestrian-Related Traffic Control Devices

(1992)

Pedestrian Half Signals



- Installed under the following circumstances:
 1. School crossing location where there are inadequate gaps in motor vehicle traffic.
 2. High pedestrian volume crossing location (100 pedestrians per hour for four hours of the day) where there are inadequate gaps in motor vehicle traffic.
 3. Installed at request of neighborhood/elected official - does not meet pedestrian volume requirement.
- Currently there are 50 half signals in operation. Historically, SED has installed two or three per year.
- **Issue:** Warrants are not responsive based upon pedestrian exposure or risk.
- **Goal:** Currently working on developing a new half signal warrant based upon roadway conditions and pedestrian generators; e.g., senior citizen housing. Obtain City Council/Mayor's approval (ordinance) for this type of signal. It is not an accepted design standard.

"Nu-Art" and Beacons



- Generally installed after previous treatments are installed and additional warning is deemed necessary.
 - Devices in the past were typically installed on high volume, multi-lane arterials where pedestrian crossing was most difficult.
 - **Issue:** Current practice is to install Nu-Arts on two lane arterials due to multiple threat accident potential on multi-lane arterials - these devices do result in additional motorists stopping but not all motorists stop.
 - **Goal:** Develop a consistent policy for the installation of the devices.

Right Turn on Red Restrictions



- Sign installed under the following situations:
 1. Significant pedestrian/vehicular or vehicular/vehicular right turn conflict; high complaint location.
 2. All-way walk: West Seattle Junction; Pike Place Market; 15th Avenue South and Beacon Avenue South.
 3. Sight restrictions or geometry considerations.
- **Issues:** A right turn on red pedestrian/vehicular conflict may exist that is not reflected in the collision history due to low speeds and pedestrian evasive action. Also problem has been made worse by large curb radii that allow motorists to begin turning maneuver while looking for a gap in the approaching traffic.
- **Goal:** Develop measurable criteria for installing this turn restriction in order to be proactive.

Speed Limit



- **Issues:** Studies reveal motorists compliance to the crosswalk legislation is significantly reduced at higher speeds; pedestrian collisions are more frequent and more severe on higher speed facilities; higher speeds create pedestrian-unfriendly environments; reduced speed limits often result in motorists complaints; the 85th percentile on many arterials is five miles per hour above the posted speed limit; speed limit reduction evaluations are based upon current speeds, not desired speeds.
- **Goal:** Reduce speed in combination with other improvements along select sections of arterials that are commercial/pedestrian oriented to help create more pedestrian-friendly environments as demonstration projects.

Appendix 3

Bicycle and Pedestrian Facilities Planning Seminar

**Sponsored by the
Illinois Department of Transportation
July 21-22, 1992, Schaumburg, Illinois
July 23-24, 1992, Collinsville, Illinois**

Goal

To train engineers, planners, and others to plan and design bicycle facilities in order to make Illinois "bicycle friendly," and to address the multimodal concepts promoted in the new "ISTEA" legislation.

Seminar Activities

- Analysis of new ISTEA legislation on bicycling and walking
- *AASHTO Guide for the Development of Bicycle Facilities 1992*—front-to-back review of planning and design guidelines
- Assessment of barriers to increased bicycle use
- Identification of strategies to eliminating barriers
- Analysis of problem situations (bridges, overpasses, community, etc.)

The focus of each of these course elements will be on developing "hands-on" strategies on how citizens and Government can work together to create a bicycle-friendly community that will result in increased bicycle use. Included will be "nuts and bolts" information on planning, facility design, educational programs, and citizen participation.

PRODUCED BY

Bicycle Federation of America
Andy Clarke & Peter Lagerwey
1818 R Street, NW
Washington, D.C. 20009
(202) 332-6986

PRODUCED FOR

Illinois Department of Transportation

Agenda (Day One)

- I. Sign In/Pick Up Seminar Materials (30 minutes)
10:00 - 10:30

- II. Why Bicycle and Pedestrian Planning (30 minutes, AC)
10:30 - 11:00
 - ISTEA - Planning Requirements
 - Accidents

- III. Barriers to Increased Bicycle Use (45 minutes, AC, PL)
11:00 - 11:45
 - Why People Do and Do Not Bicycle
 - Overcoming the “naysayers”

- IV. Institutionalizing Bicycle & Pedestrian Planning Within the Department of Transportation (45 minutes, PL)
11:45 - 12:30
 - Institutionalizing ISTEA
 - Action Plan of Government
 - Action Plan for Citizens

- V. Lunch (90 minutes) 12:30 - 2:00

- VI. Intro to Facility Planning (45 minutes, AC, PL)
2:00 - 2:45
 - AASHTO Guidelines
 - Where, why and how of facility selection

- VII. Facility Design (90 minutes, PL, AC)
2:45 - 4:30 (break in middle)
 - AASHTO Guidelines
 - Guidelines for arterials, shoulders, lanes and paths
 - Bicycle Parking
 - Signs (MUTCD)
 - Bridges
 - Liability

- VIII. Education and Safety Programs (30 minutes, AC)
4:30 - 5:00
 - Successful Programs
 - Organizing Programs for Results
 - How to Target Audiences
 - Encouragement, What I-DOT Can Do

Agenda (Day Two)

- IX. Citizen Participation (60 minutes, PL)
8-30 - 9:30
 - Video - Ingredients of Success
 - Making a Bike Advisory Board Work
 - Working with Advocacy Groups

- X. Problem Solving (60 minutes, AC, PL)
9:30 - 10:30
 - Design Problems
 - Citizen Issues
 - Funding

- XI. Break (15 minutes)
10:30 - 10:45

- XII. Intermodal Surface Transportation Efficiency Act (ISTEA) (60 minutes)
10:45 - 11:45
 - Overview of Legislation
 - FHWA Direction/Interpretation
 - Implications for Bikes and Peds
 - Enhancements

- XIII. Lunch (90 minutes)
11:45 - 1:15

- XIV. Planning Pedestrian Facilities (90 minutes, AC, PL)
1:15 - 3:00 (break in middle)
 - Walking as Transportation
 - Traffic Issues (crosswalks, etc.)
 - Design Issues (sidewalks, etc.)
 - Model Work Plan

Appendix 4

Ten Steps to Cooperative Commuting: The Government Role

In order to achieve these goals, it is recommended that Pierce County, Pierce Transit, and other jurisdictions in the County adopt the following strategies to integrate nonmotorized commuters into a Cooperative Commuters program.

1. Realistic and quantifiable goals for increasing nonmotorized commuting must be required in all employer TDM programs and plans. Without a nonmotorized element, TDM plans and programs should not be approved.
2. Model plans and programs to stimulate nonmotorized commuting should be developed for employee transportation coordinators.
3. Cooperative Commuting program staff should receive a minimum level of training in nonmotorized planning and program development. In addition, they should be required to provide a minimum amount of training to employee transportation coordinators in the same disciplines.
4. Cooperative Commuting program staff should work with employers to develop vehicle trip reduction plans and incentive programs that incorporate strategies for increasing nonmotorized commuting.
5. Employer vehicle trip reduction plans should be regularly reviewed to determine progress towards meeting the goals for nonmotorized commuting. Success should be rewarded with company tax credits or other incentives.
6. Cooperative Commuting program staff should work closely with transit and other Government agencies and transportation providers to increase the convenience and flexibility of multimodal trips, for example by improving access to bus stops, providing bicycle parking at bus stops and transit centers and starting bikes on buses programs.
7. Cooperative Commuting program staff should be represented on BACs and other citizen committees devoted to nonmotorized issues. Staff should work with bicyclists and pedestrians to identify barriers to nonmotorized commuting and devise plans to overcome those barriers. Where necessary, Cooperative Commuting program staff should negotiate the introduction of shuttle-van services to pass physical barriers that cannot otherwise be surmounted.

8. Cooperative Commuting program staff should ensure that all program materials (including posters, information brochures, slide and video presentations, and event literature) incorporate graphics and text depicting people walking and bicycling. If a newsletter is produced, this should include testimonials from bicycle commuters, announcements of new bicycle facilities—lockers, paths, etc., and bicycling and walking safety tips.
9. A range of materials and information on bicycling and walking, such as that required to carry out the bicycle commuting programs detailed in the previous section, must be developed. In particular, commuter route maps, health and fitness information, brochures on riding technique and information targeted at motorists should be a priority. Consideration should be given to requiring at least one bicycling and/or walking promotional event in each year.
10. Technical assistance and funding should be provided to assist employers, employee transportation coordinators, and building managers in installing high-quality, secure, and convenient bicycle parking, shower, and locker facilities.

Ten Steps to Cooperative Commuting: The Role of Employers

In developing materials and model programs for employers and employee transportation coordinators, Cooperative Commuting program staff should request or require the incorporation of all bicycle commuting strategies listed in the previous section. In addition, information on the following program elements should be incorporated into Cooperative Commuting programs.

1. Information on nonmotorized commuting should be available at any required Commuter Information Center, board, or kiosk.
2. Ride-matching programs should be extended to provide a “bike-buddy” matching program.
3. Discounts, incentives, and subsidies provided to people who rideshare, telecommute, or otherwise assist in reducing single-occupant-vehicle commuting should be extended to include those who walk or bicycle. Consideration should be given to weighting the incentives given to the users of different modes.
4. Tax-free perks provided to car parking and to transit users should also be available to bicycle and pedestrian commuters. Providing a commuting allowance—to be put toward the price of any mode—to all employees would be of particular benefit to bicyclists and pedestrians.
5. Specific bonuses should be developed for nonmotorized commuters—such as 3 or 4 days of free parking each month, for the days when bicycling and/or walking is impossible.

6. Allowing flexible work hours, compressed workweeks, and other temporal benefits can particularly enhance bicycling opportunities, as morning and evening peak traffic flows are often the most daunting to potential bicycle commuters.
7. Bicyclists and pedestrians should be incorporated into Guaranteed Ride Home services.
8. Cooperative Commuting programs should be sufficiently flexible to reward participants even if they don't ride or walk every single day of the year.
9. Provision of inviting onsite changing rooms, lockers, and showers for bicycle commuters (and any other employee who exercises during the day or needs to wash up) should be required—or access to nearby facilities guaranteed.
10. Motorpools and company car fleets should be supplemented with bicycles and bicycle trailers.