

NATIONAL BICYCLING AND WALKING STUDY INTERIM REPORT

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1991**TABLE OF CONTENTS**

List of Figures	iii
List of Tables	iii
Executive Summary	iv
Introduction	vii
Sample Response to Federal Register Notice	x
Chapter 1 - Current Usage and Constraints to Usage	1
Introduction	2
Available Information	3
Additional Information Needed	16
Approaches to Collecting Needed Information	16
Chapter 2 - Plan for Increased Usage	19
Introduction	20
Available Information	20
Additional Information Needed	39
Approaches to Collecting Needed Information	39
Chapter 3 - Costs and Benefits	41
Introduction	42
Available Information	42
Additional Information Needed	55
Approaches to Collecting Needed Information	57
Chapter 4 - Success of Promotional Programs	59
Available Information	60
Additional Information Needed	77
Approaches to Collecting Needed Information	77
Chapter 5 - Outlook and Next Steps	79
Appendix	81
Endnotes	87
Photo Credits	96

As an initial task of the National Walking and Bicycling Study, a Notice and Request for Comments was published in the *Federal Register* on February 5, 1991. Over 500 responses were received by August 1991, and are summarized in the Appendix. Nearly all of the respondents support a program to increase the number of pedestrian and bicycle facilities. Respondents commented on what they felt was needed in their hometowns to make them safe for people, especially children and the elderly, to walk or cycle. Most of the respondents, as characterized in the following letter, complained about not having sidewalks or bike lanes within their residential communities or paths leading to local businesses, libraries, parks, etc.

Other comments were solicited from State and local personnel and other interested parties through meetings. A meeting was held with State and local representatives involved with bicycling and pedestrian activities in May 1991 in Washington, D.C. Next a large workshop of selected national leaders and experts was held in North Carolina in July 1991. Information and comments obtained from these meetings have been incorporated into this report.

Sample Response to Federal Register Notice

Dear Mr. Fegan;

June 5

Please give Congress this message from all of us:

We would love to ride our bicycles to work, but to do so would be to take our lives in our hands. There are no accommodations for cyclists on most streets, no shoulders, no bike access. Cyclists are made to feel like foreigners in America, out of place and unwelcome.

We need to develop a network of bicycle trails throughout the area so people will get off their couches and get into walking & cycling. It's up to the government and big business to use some dollars and set up these facilities.

In California, a walker entering an intersection will cause cars to automatically halt. It's the law, and it's obeyed. Why shouldn't that be the case in all states?

Please let Congress know that a lot of voters will be watching this matter with great concern. Thank you.

Pamela S. Schroeder

LIST OF FIGURES

1. Percent of commuters commuting by type of transportation	4
2. Urbanized areas where 15 percent or more of the population either walk or bike to work	5
3. Daily trips by purpose	6
4. Walking and bicycling trips by purpose	7
5. Modal preferences for work trips under various conditions	23
6. Preferred mode of travel for work trips when pedestrian facilities are added	24
7. Preferred mode of travel for work trips when bicycle facilities are added	25

LIST OF TABLES

1. Reasons people do or do not bike or walk	14
2. Major cost elements of facilities and programs	50
3. Construction costs for bicycle/pedestrian facilities per 100 linear feet of program element	50
4. Construction costs for bicycle/pedestrian facilities per individual program element	51
5. Annual maintenance and operational costs per 100 linear feet of element	51

EXECUTIVE SUMMARY

Bicycling and walking constitute a small, but growing, portion of trips made in the U.S. today. The challenge is to provide an environment conducive to bicycling and walking. An increase in bicycling and walking would result in increased health and fitness, an improved environment, and a more effective use of the existing transportation system. Clearly the climate is right for promoting bicycling and walking through a variety of ways such as new facilities, educational programs, and advertisements. Although the Federal Government can play an important role promoting bicycling and walking, involvement by State and local officials, private industry, and citizens is crucial.

Current Usage and Constraints to Usage

Available data from the U.S. Census Journey to Work Survey and the Nationwide Personal Transportation Survey (NPTS) suggest low levels of bicycling and walking nationwide. This is indicated for work trips as well as those for school, shopping, recreation, and personal purposes. In 1980, the Census data indicated that 3.3 million persons commuted to work by walking and 800,000 persons by bicycling--almost seven percent of all work trips. The NPTS, which examined all trips, showed levels of about one percent for bicycling and seven percent for walking. Many individual communities, however, have achieved higher levels of bicycling and walking, such as Boulder, Colorado; Seattle, Washington; and Eugene, Oregon.

The challenge is to increase the number of bicycle and walking trips for all trip purposes. Available data indicate that nearly two out of three trips are less than five miles long. These trips provide many opportunities for conversion from auto to bicycle or walking. Four out of five trips are less than ten miles long. These longer trips also provide potential for bicycling and walking when combined with other transportation modes.

Although many reasons are given for not bicycling and walking, a number of public opinion surveys and research studies indicate that the public **wants** to bicycle and walk more. A recent Harris Poll concluded that a ten-fold increase in adult bicyclists, from three to 35 million, would result if better facilities were available. Even without these facilities people are bicycling more, according to recent data collected by the bicycle industry. The data show that the number of adults riding regularly nearly doubled from 1985 to 1989--increasing from 12 million to 23 million riders. Results from the most recent Nationwide Recreation Survey conducted in 1982-83 support this trend, in which 28 percent of the

survey respondents reported bicycling within the last three months and 37 percent within the last year.

Perhaps even more relevant than surveys is the local support demonstrated in communities across the country for facilities and programs to improve the conditions for bicycling and walking. In communities from Cranford, New Jersey, to Palo Alto, California, bicycling and walking have been integrated into the transportation system, and now comprise a sizeable proportion of all trips in those locations.

Plan for Increased Usage

Based on available information, various measures were identified which can be used to increase levels of bicycling and walking. **Facilities** can be provided which are scenic, safe, well-designed, enjoyable, and oriented to points of interest. People would travel on a particular path if they knew it was attractive and safe--a relaxing experience. Providing bicycle racks or lockers can also encourage cycling. Bicycle racks on public transit would also encourage people to ride their bicycles as a part of multi-modal trips. **Compact land use patterns** encourage bicycling and walking where travel distances are short and travel on bicycle or on foot is more practical. **Disincentives** to using motor vehicles, such as a lack of parking, can also promote bicycling and walking.

Promotional programs such as educational programs in schools, driver education courses, bicycling and walking tours, and media campaigns can also encourage cycling and walking. These can be used in conjunction with health, fitness, and exercise programs. Bicycling and walking fit in well with environmental concerns. Communities and States are establishing bicycle and pedestrian coordinator positions. In addition, organizations exist at the local, State, and Federal levels to promote bicycling and walking, and a growing network is available for disseminating information and encouraging activities at these levels.

As part of the Study, these measures will be integrated into a framework for State and local plans to promote bicycling and walking. The Study will also address safety issues and how the various measures will provide a safer environment for cycling and walking.

Benefits and Costs

Increased walking and cycling would result in benefits to individuals, to the environment, and to society. Benefits and costs are related to the size of a community and its development patterns. Benefits from

expanded use of bicycling and walking include increased health and fitness, an improved environment, and a more cost-effective use of the existing transportation system. Costs include those needed to construct and operate facilities and to develop and implement educational and promotional programs.

The key to maximizing the benefits and minimizing the costs of these measures is the development of a continuing program to institutionalize pedestrian and bicyclist needs into the transportation planning process. Providing facilities and other measures on a system-wide basis is most effective in promoting cycling and walking when considered in conjunction with auto and transit modes. It is also more effective for bicycle and pedestrian facilities to be incorporated as part of an overall system-wide plan.

Success of Promotional Programs

Much can be learned from studying cities considered "best" for bicycling and walking. In these locations, many successful promotional measures and programs are in place. However, other characteristics of these cities include broader qualities that encourage cycling and walking. They have appealing places to cycle or walk, have institutionalized bicycling and walking in the transportation planning process, and have active community groups promoting cycling and walking.

Federal Role and Programs

The U.S. DOT can play a leadership role in promoting safe bicycling and walking throughout the United States. This role and the measures which should be instituted will be developed as the result of this Study. They will be based on an assessment of the information developed to date together with other efforts being developed as part of on-going studies. The end product will be a framework for State and local plans to promote bicycling and walking and an action plan for implementing the Federal transportation policy.

INTRODUCTION

Americans today are health conscious and environmentally concerned. Bicycling and walking are means of transportation consistent with these attitudes. They are pollution-free and provide an opportunity for exercise. The U.S. Department of Transportation (U.S. DOT) is in the initial phase of identifying its role in developing policies and programs to promote bicycling and walking.

Our Nation's transportation systems are subject to increasing demands as the population grows and spreads from the older, high-density urban centers. With the increase in vehicular travel demands, roads are becoming more congested and travel speeds are decreasing. Energy usage and pollution escalate even as cars become more fuel efficient and cleaner. The transportation community is searching for ways to address these problems.

Bicycling and walking currently make up a small percentage of all travel trips. Some contributing factors are the large number of available automobiles, the Nation's extensive roadway network, and dispersed land use patterns, which result in many Americans needing a car for most of their day-to-day activities. However, the success and convenience of the auto have led to a need to evaluate perpetuating development in the same way. Funding for highways is limited and cities have problems fitting additional highways into their present transportation systems. Furthermore, the Clean Air Act mandates the reduction of air pollutants which translates into lower automobile emissions--either by fewer emissions per mile or fewer vehicular miles travelled. An increase in bicycling and walking provides an opportunity to relieve the pressure on America's roads and to improve the environment.

In 1980, the U.S. DOT completed a study called "Bicycle Transportation for Energy Conservation." This study identified obstacles to widespread bicycle use, recommended plans for a Comprehensive Bicycle Transportation Program, established target goals for increased bicycle use, estimated the energy conservation potential of bicycle transportation, and instituted the U.S. DOT's bicycle policy. Yet, little was accomplished as a result of that study because of a change in policy direction after the report was issued. A recent statement of national transportation policy issued by the U.S. DOT in February 1990 declares the following:

It is Federal transportation policy to:

- **Increase pedestrian safety through public information and improved crosswalk design, school crossings, and sidewalks.**
- **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.**

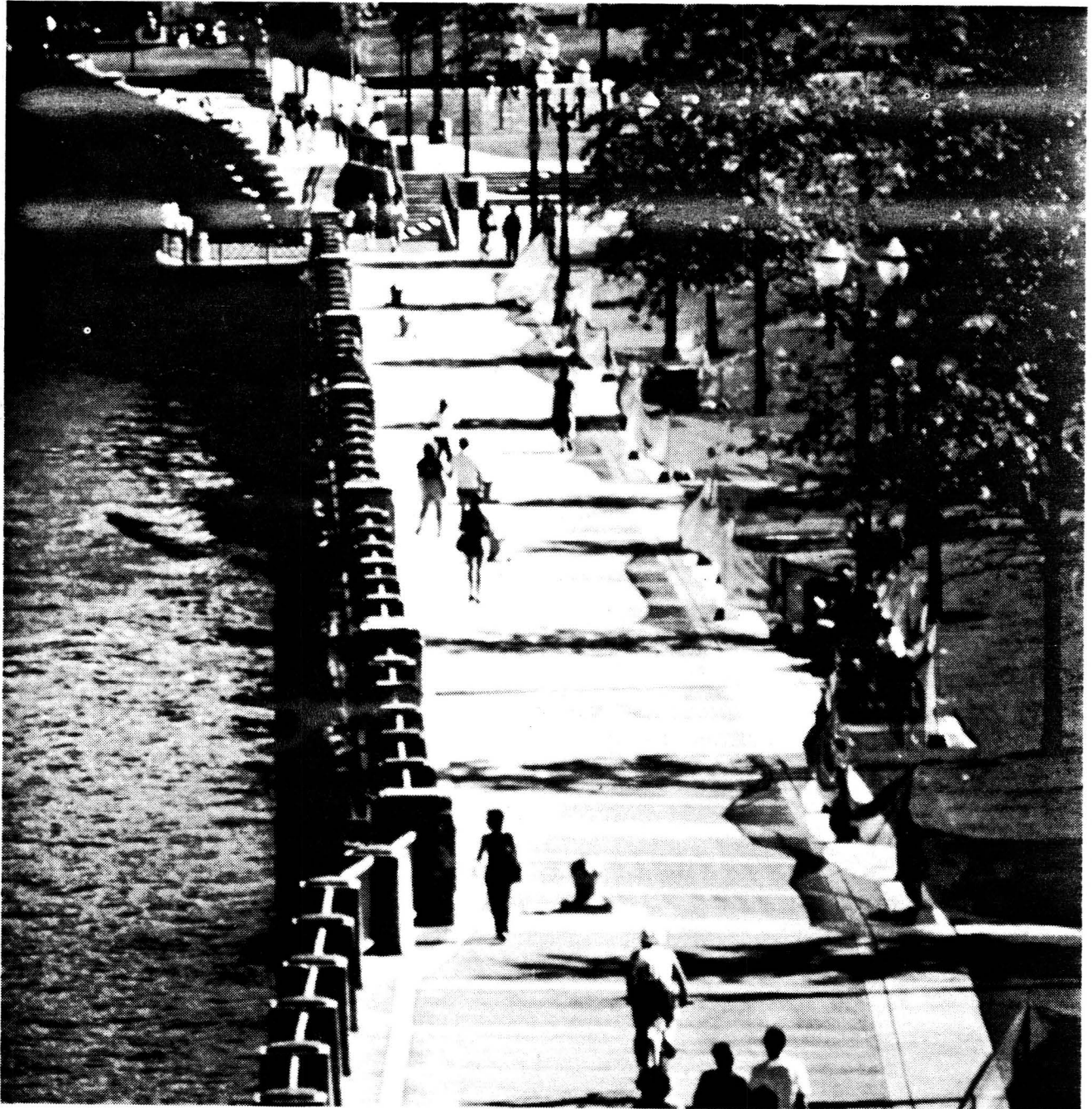
The fiscal year 1991 U.S. DOT Appropriations Act directed the Secretary of Transportation to conduct a National Bicycling and Walking Study. The five objectives of the study as specified in the Act are to:

1. **Determine the current levels of bicycling and walking and identify reasons they are not better used as means of transportation.**
2. **Develop a plan for the increased use and enhanced safety of these modes and identify the resources necessary to implement and achieve this plan.**
3. **Determine the full costs and benefits of promoting bicycling and walking in urban and suburban areas.**
4. **Review and evaluate the success of promotion programs around the world to determine their applicability to the role required of the U.S. Department of Transportation to implement a successful program.**
5. **Develop an action plan, including timetable and budget, for implementation of such Federal transportation policy.**

The purpose of this "Interim Report" is to document progress in addressing these five objectives. In dealing with each objective, this report summarizes available information, discusses what additional information is required, and outlines the approach to be used in collecting it. This additional information will be obtained from special case studies to be conducted over the next year as part of the overall study.

CHAPTER I

CURRENT USAGE AND CONSTRAINTS TO USAGE



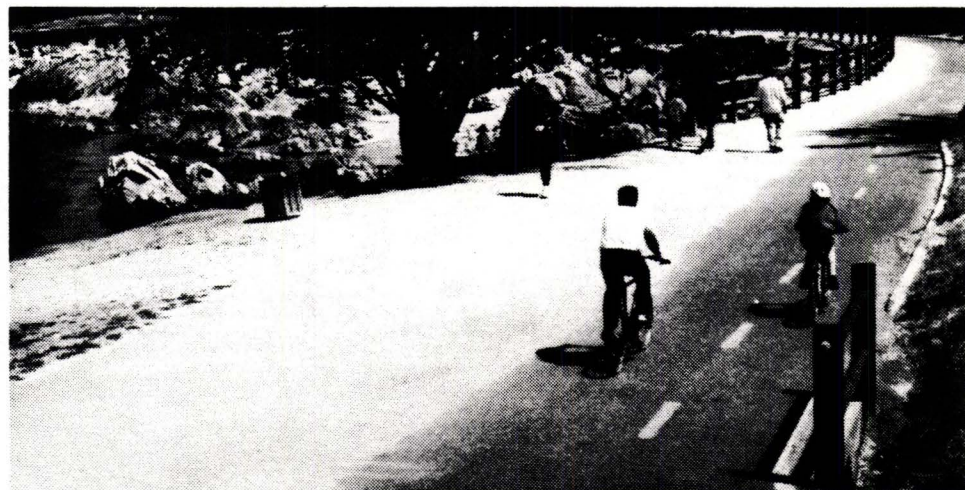
INTRODUCTION

In the report Moving America, the U.S. Department of Transportation (U.S. DOT) outlines national transportation policies and action strategies for carrying America into the 21st century. Two Federal transportation policies pertain specifically to bicycling and walking:

- (1) To increase pedestrian safety through public information and improved crosswalk design, school crossings, and sidewalks.
- (2) 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.¹

A major theme of Moving America is protection of the nation's environment and quality of life. Bicycling and walking are important components of this agenda.

In many foreign countries, bicycling and walking are used extensively for personal transportation needs. Worldwide, bicycles outnumber cars by two to one and bicycle production outpaces automobile manufacturing by three to one.² In many developing countries, as well as some industrialized nations, bicycling and walking are the primary means of transportation. In other countries, they are a frequent "mode of choice." In the Netherlands, for example, up to a third of all urban trips are made by bicycle. The Netherlands, Denmark, Germany, and Japan have successfully integrated automobiles, public transportation, and human-powered transport. While there are some important differences between these countries and the United States, the same success may be achievable in this country **at the community level.**



Bicycle/pedestrian facility.

This chapter summarizes available information on current levels of bicycling and walking in the United States, and identifies reasons bicycling and walking are not better used as means of transportation. Chapter 1 also discusses additional information that is needed and the ways this information will be obtained to support the National Bicycling and Walking Study.

Levels of Bicycling and Walking

AVAILABLE INFORMATION

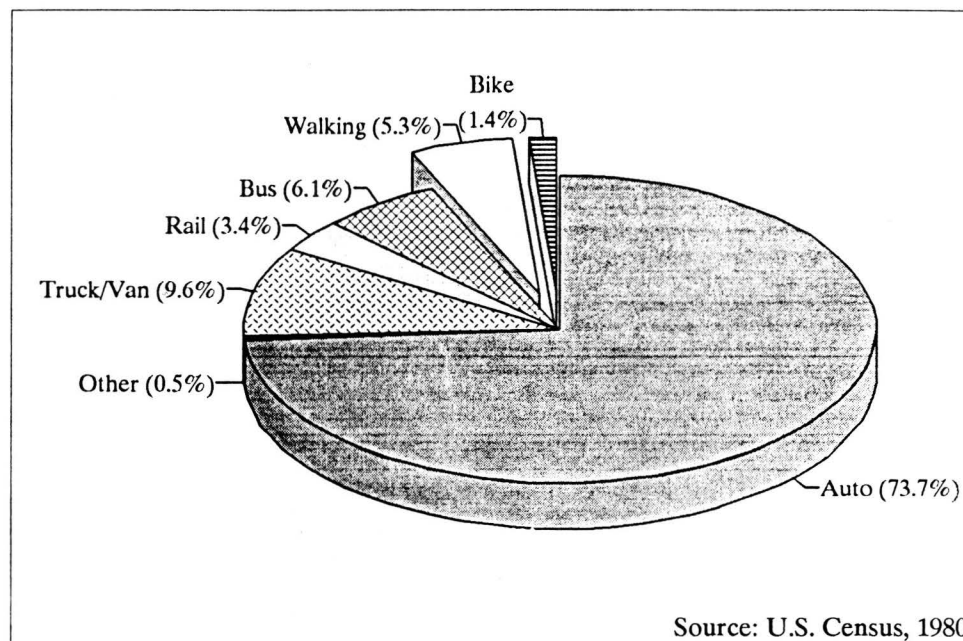
Two sources of routinely collected data on levels of bicycling and walking in the United States are the U.S. Census and the Nationwide Personal Transportation Survey. A third source, the Nationwide Recreation Survey, collects data on a less regular basis. Additional sources of information include industry data and other local, State, and national surveys. This section summarizes the information from these sources.

U.S. Census Data. The U.S. Bureau of the Census collects transportation-related data for urbanized areas through its "Journey to Work" survey. The data are used by local and State transportation planners and others concerned with urban development.

It is important to note the limitations of the Census data in regard to bicycling and walking. The survey only reports travel information for participants in the work force aged 16 and above. In the 1980 survey, this represented 46 percent of the total U.S. population. The Census survey also reports only on travel to and from work, which excludes trips to school, shopping, etc.

Another limitation of the Census survey is that the data were collected during the last week in March, a time when lingering cold weather in many parts of the country is likely to discourage bicycling and walking. Moreover, survey participants are asked to report only their "usual" mode of travel during this one-week period, in which "usual" is defined as the mode used most often and for the greatest distance. Bicycling or walking that might have constituted the short part of a trip involving other modes would not be included. An example would be a short bike ride to a transit stop, followed by a longer subway ride to work, which would only be reported as a transit trip. All of these factors contribute to an under reporting of bicycling and walking trips, the extent of which is not known.

Figure 1. Percent of commuters commuting by type of transportation.



The 1980 Census survey indicates that 3.3 million people (5.3 percent of all workers) commute to work by walking (see Figure 1). An additional 800,000 people (1.4 percent) ride a bicycle to work. In contrast, 73.7 percent of workers commute by auto, 9.6 percent by truck or van, 6.1 percent by bus, and 3.4 percent by rail.^{3,4} Although these percentages are low, in some locations bicycling and walking contribute significantly to total trips. For example, walking accounted for 17.2 percent of all commuting trips in Seaside-Monterey, California; 13.7 percent in Boulder, Colorado; 17.5 percent in Champaign-Urbana, Illinois; 21.1 percent in Bloomington, Indiana; 19.2 percent in Annapolis, Maryland; and 34.6 percent in State College, Pennsylvania. In 43 metropolitan areas (12 percent of those sampled), ten percent or more of the population walked to work.⁵

Metropolitan areas with high levels of commuting to work by bicycle include Chico (8.9 percent) and Santa Barbara (6.5 percent), California; Gainesville, Florida (6.2 percent); Eugene, Oregon (5.7 percent); and Missoula, Montana (5.0 percent).⁶ Many university communities have high levels of bicycle commuting and strong bicycle programs. The map in Figure 2 identifies urbanized areas where 15 percent or more of commuting trips were made by walking and bicycling. Additional communities could have been identified if the Census survey had been conducted later in the year. For example, in Ann Arbor, Michigan, and Fargo, North Dakota, 14 percent of the work force walks

or bicycles to work, despite the fact that March is still a "winter weather" month in both States.

Over the 20-year period covered by the 1960, 1970, and 1980 Census surveys, the percentage of trips by private motor vehicle (autos, vans, and light trucks) increased from 73.4 to 83.4 percent. The percentages of trips by bus, rail, and walking all declined.⁷ (Separate information on bicycling was not reported until the 1980 Census survey.) These numbers emphasize that without a definite plan of action, levels of bicycling and walking are unlikely to grow.

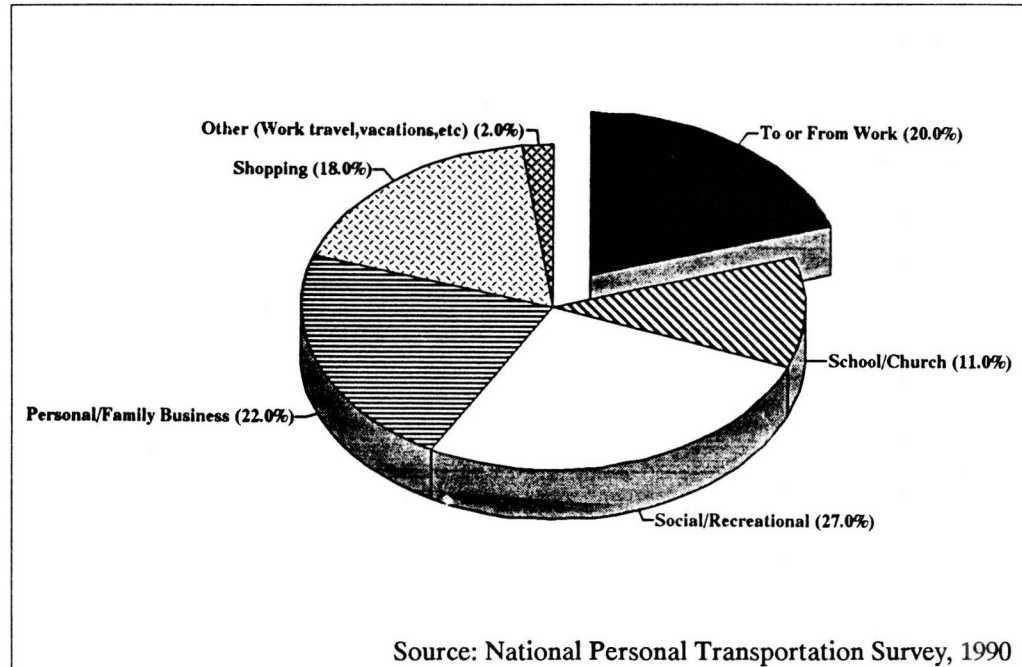
More detailed analyses of walking and bicycling trips based on the 1990 Census survey data are planned and will be presented in the final National Bicycling and Walking Study if available.

Nationwide Personal Transportation Survey. The Nationwide Personal Transportation Survey (NPTS) is conducted approximately every seven years. There have been four surveys to date--1969, 1977, 1983, and 1990. The first three were home interview surveys; the most



Figure 2. Urbanized areas where 15 percent or more of the population either walk or bike to work.

Figure 3. Daily trips by purpose.



recent was a telephone survey. An important distinction of the NPTS is that it reports the full range of trips, not just commuting to work trips, which account for only one out of every five trips, or 20 percent of total vehicle miles (See Figure 3). The NPTS is conducted throughout the year and includes all people age five and older.

The 1990 NPTS interviewed 48,000 people in 22,000 households.⁸ Detailed travel information was collected. Each respondent provided information on all trips made during a recent 24-hour period, including different travel modes for each segment of multi-modal trips, such as walking to a bus stop or bicycling to a rail station. Results are representative of all trips made by people age five and older during 1990. Of the total trips, **7.2 percent** were made by walking and **0.7 percent** by bicycling.⁹ In comparison with the 1977 survey, the percentage of walking trips has declined, while the percentage of bicycling trips has remained about the same. Use of public transportation has also declined. Private vehicle use, on the other hand, has steadily increased since the 1977 survey. For work trips, these results parallel those of the Census survey.

Walking trips are categorized as visits to friends or relatives and other social or recreational purposes (34.2 percent), trips to school or church (20.3 percent), shopping (17.5 percent), other family or personal business (14.9 percent), and trips to or from work (10.9 percent). Bicycle trips share the same purposes, but are most commonly used for social or

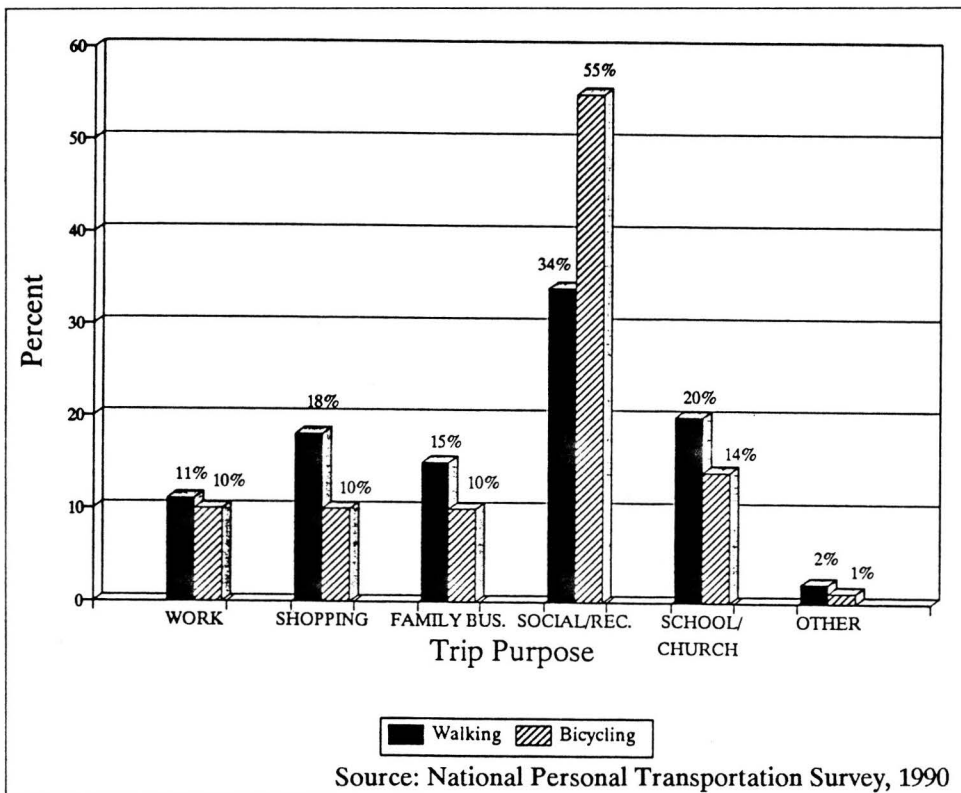


Figure 4. Walking and bicycling trips by purpose.

recreational travel (55.4 percent). These numbers, graphically presented in Figure 4, are only slightly different from the 1983 NPTS survey results.

Other findings from the preliminary analysis of the 1990 NPTS data include:

- More than three-fourths of all bicycle trips and 60 percent of all walking trips are made by people under 30 years old. Twenty- to 29-year-olds account for more walking and bicycling trips between home and work than any other age group.
- Males are three times more likely than females to bicycle, but males and females walk about equally often.
- People with an annual income less than \$10,000 are much more likely than those with higher incomes to travel by walking.
- Bicycle and walking trips are most common in central city areas. Over ten percent of all central city trips are made by walking.

Pedestrians wait to cross a busy street in an urban setting.



- Walking trips occur most frequently in urbanized areas of over one million people; bicycle trips occur most frequently in areas with less than one million people.
- Only 0.3 percent of home-to-work trips are made by bicycling, and 3.9 percent by walking.
- Families with older children (age 16 and over) make significantly more bicycle trips than other types of families, while single adults and married adults with no children make more walking trips.
- Only one percent of the total number of person trips was multi-modal; 60 percent of these trips involved walking for at least one of the segments, but none involved bicycling.

This information will be helpful in targeting populations for increasing levels of bicycling and walking.

The NPTS shows an enormous **potential** for increased bicycling and walking. According to 1983 NPTS survey results, the average length of a trip is just under eight miles. Trips to work are slightly longer, while shopping trips are shorter. **Two out of three trips are less than five miles long, and four out of five are less than 10 miles long.** These shorter trips represent the potential for switching from motorized to nonmotorized transportation.

More detailed results of the 1990 NPTS, including public transportation aspects, will be incorporated into the final study report.

1982-1983 Nationwide Recreation Survey. A third source of data is the 1982-1983 Nationwide Recreation Survey (NRS).¹⁰ This was a cooperative effort by the National Park Service and other Federal agencies. Household interviews were conducted during the months of September, January, April and June as part of another ongoing national household sample survey. Results are based on interviews with 5,757 people age 12 and older, similar to surveys conducted in 1960 and 1965.

The NRS gives evidence of strong growth in bicycling and walking over the past two decades. Only nine percent of respondents to the 1960 NRS questionnaire indicated that they had bicycled within the past three months. This number jumped to 16 percent in the 1965 survey, and 28 percent in the 1982-1983 survey. The increase was particularly evident among adults; by 1982-1983, 37 percent of 25-39 year-olds and 22 percent of 45-59 year-olds indicated that they had bicycled. Bicycling also rated high in enjoyment level, topping all other casual activities (defined as those that could be enjoyed on the spur of the moment with little cost or preparation).

Pleasure walking was even more popular. In the 1982-1983 NRS, 53 percent of the respondents indicated that they had walked for pleasure during the previous year. Walking and swimming are the most widespread recreation activity among Americans of all ages.

The NRS also collected a wealth of demographic information, and asked why people enjoyed certain activities and did not engage in them more often. Some of this material is summarized in a later section.

Harris Poll Survey on Bicycle Commuting. A survey was recently conducted by the Harris Poll for Bicycling magazine.¹¹ Survey results are based on 1,254 telephone interviews of a representative sample of adults. The survey was conducted in November 1990. Results showed that

- Forty-two percent of adults, or 70 million individuals, had ridden a bicycle within the past year.
- Twenty-four percent, or 39 million adults, had ridden within the past month.

- Among those riding within the past month, over three-fourths had ridden for recreation, and nearly two-thirds for fitness.
- Seven percent of adults riding during the past month commuted to work by bicycle, averaging 12 commuting trips per month.

As with the Census and NPTS surveys, the Harris Poll survey showed that younger people were more likely to have bicycled than older people (54 percent of those aged 18 to 39, compared with 30 percent of those aged 40 and older), and males were more likely to have bicycled than females (45 percent compared with 39 percent). Bicycling was more popular in the Midwest and West than in the East and South.

The Harris Poll survey identified incentives and disincentives for bicycle commuting. These results are discussed later in this section. The survey concluded that bicycle commuters could potentially increase from the current three million to 35 million if better facilities were available.

Bicycle Industry Data. Data generated by the bicycle industry on levels of bicycle sales and usage are summarized in the Bicycling Reference Book published annually by the Bicycle Institute of America.¹² The 1990-1991 edition estimated that 48 million adults (age 16 and older) and 42 million children bicycled in 1989. Twenty-three million adults cycled regularly, averaging at least one ride per week. There were also 3.2 million bicycle commuters, 1.1 million persons who toured or vacationed by bike, and 2.7 million persons who participated in recreational

A designated bike lane in Madison, Wisconsin.



bicycle events, all of which represents tremendous growth over previous years. According to this report, the number of adults riding regularly has doubled in the past five years.

Other Sources of Information on Levels of Bicycling and Walking. Communities and States across the country have estimated their own levels of bicycling and walking, usually in conjunction with efforts to increase the use of these modes. A survey conducted in 1985 by the University of Minnesota found that 59 percent of all Minnesotans age 16 and older bicycled one or more times in 1985, and that one in ten had ridden a bicycle to work at least once during the year.¹³ The State is developing a plan to make the bicycle "not just a smart means of transportation, but a viable and attractive option from which Minnesotans can choose."

In Madison, Wisconsin, 11 percent of licensed drivers commute each day by bike.¹⁴ Since 1978, the Dane County area, which includes Madison, has emphasized an integrated multi-modal system throughout the county. Bicycles are viewed as an important part of this system. In a random sample of 300 bicyclists in the Madison area, 23 percent identified transportation as their primary reason for bicycling, and an additional 14 percent assigned equal importance to transportation and recreational purposes.¹⁵

In addition to being recognized as a premier walking city, New York City also enjoys high levels of bicycling. Each year, volunteers from the Transportation Alternatives organization conduct count surveys of all bicycles and motor vehicles traveling during midday on midtown Manhattan avenues. In the May 1990 survey, 9.6 percent of all vehicles counted were bicycles, up from 8.4 percent the previous year. One goal of the survey is "to prod the New York City Department of Transportation to recognize bicycling as a major component of the traffic mix."¹⁶

Information on levels of bicycling is also available from a variety of other local surveys conducted by communities such as Seattle, Washington, and Boulder, Colorado, that have made strong efforts to promote both bicycling and walking. Considerably less information is available on walking. The National Bicycling and Walking Study will synthesize the information that is available and recommend the best approaches for collecting and disseminating such data.

Reasons Bicycling and Walking Are Not Better Used

Surveys and comparison studies are two principal ways to examine why bicycling and walking are not better used as means of transportation.

Surveys. The approach most often taken is simply to ask people why they do or do not bike or walk. This yields some fairly predictable responses, including:

- Length of trip and travel time.
- Absence of bike lanes, sidewalks, and other safe places to bike or walk.
- Lack of secure bicycle parking, showers at work, etc.
- Fear of crime.

Many surveys have asked people why they do or do not walk or bicycle, including several of the national, State, and local surveys already cited, as well as some government-sponsored research. Highlights of such surveys are presented below:

- When asked why they did not bicycle or walk more often, most respondents to the 1982-1983 Nationwide Recreation Survey cited a lack of time. Personal safety problems and no place to ride a bicycle were also frequently cited.¹⁷
- In the Harris Poll survey, 49 percent of respondents who rode bicycles but had not commuted to work by bike during the past month said they would sometimes commute by bike if there were safe bike lanes; 44 percent of the respondents would commute if they had access to secure bike storage/parking and showers at work.¹⁸
- A survey of 4,000 people in five U.S. cities, sponsored by the Federal Highway Administration (FHWA), concluded that distance was strongly related to mode choice. The survey also showed that a combination of compact land use and provisions of pedestrian and bicycle facilities offered the greatest potential for increasing levels of nonmotorized transportation.¹⁹
- A recent Ontario survey revealed that people are much less likely to walk to work if they have access to free or inexpensive parking, or if public transportation is particularly convenient.²⁰

- Of licensed drivers surveyed in Phoenix, Arizona, 58 percent said they rode bicycles. Most rode for recreation, but over half used their bikes for shopping and errands, and 11 percent used them for commuting (eight percent one or more times a week). Those who rode bicycles (but did not use them for commuting) most often cited long distance (31 percent), perception of danger (19 percent), lack of facilities and equipment (17 percent), and need for a car on the job (14 percent).²¹

Reasons people do or do not bike or walk are multifaceted, and must address less tangible considerations such as environmental concerns, health and fitness goals, desire for independence, and attitude concerning bicycling and walking. These reflect broader concerns about the quality of life in general. Table 1 summarizes many reasons people do or do not bike and walk.

Comparison Studies. Another approach to learning why bicycling and walking are not better used as means of transportation is to compare places where they are used to places where they are not used, and to identify factors causing the observed differences in use. For example, comparisons can be drawn between the United States and the Netherlands, Denmark, or Sweden, all of which have high levels of bicycling and walking. What characteristics favorable to bicycling and walking differentiate these countries from the United States? Differences noted in the literature include:

- High-density development.
- Lower rates of automobile ownership.
- Facilities conducive to biking and walking.
- National and local policies supporting biking and walking.
- Positive public perception of biking and walking.

Perhaps more useful than comparisons with other countries are comparisons between communities in the United States, and comparisons within communities over time. How do cities such as Seattle, Boulder, and Madison, which have relatively high levels of bicycling and walking, differ from comparable communities with much lower levels of bicycling and walking? What has brought about the increase in bicycling and walking in some cities?

Only a few studies have addressed these questions. A 1983 study examining factors associated with high levels of bicycle commuting identified over 200 communities in which ten percent or more of trips to

REASONS DO	REASONS DO NOT
Enjoyable - fun, avoids hassle of driving	Infeasible - destination too far away, do not own a bicycle, poor health
Feasible - destination not too far away, own a bicycle, adequate health	Fear of traffic - no sidewalks, no bicycle lane, heavy or high-speed automobile traffic
Efficient - can sometimes be faster than other travel modes, "door-to-door" service	Inadequate facilities - no place to park bicycle, no showers at work place, no bicycle lanes/sidewalks
Healthful - good exercise, low impact, weight reduction, fresh air	Personal attitude - perceived as too risky, too physically demanding, too sweaty and unprofessional
Economical - cheaper than driving a car, no parking costs	Efficiency - generally slower than other travel modes
Necessary - do not have a driver's license (too young, too old, suspended license), no car, no or inadequate public transit	Economics - driving a car still relatively cheap in U.S. compared to other countries
Environmental reasons - non-polluting, saves oil and gasoline, reduces road congestion	Not necessary - high automobile ownership in U.S., availability of public transit
Independence - from dependence on public transit, rides with parents or friends	Physical barriers - no sidewalks, cars or garbage on sidewalk, freeway crossing path
Reliable - bicycles have low maintenance, no wait for transit	Not practical - need to transport children, groceries, etc., need car at work, errands
Public perception - healthy image, stylish clothes	Public Perception - Americans love their cars, bicycling/walking not "cool"
Public transportation available as substitute on bad weather days	Weather - too hot, too cold, rain, snow, etc.
	Terrain - too hilly or mountainous
	Unhealthy - if air quality is poor
	Never seriously considered the idea!

Source: UNC Highway Safety Research Center

Table 1. Reasons people do or do not bike or walk.

educational institutions were by bicycle. However, the study identified only ten communities in which ten percent or more of trips to work or shopping destinations were by bicycle.²² It concluded that separation from high-speed motor vehicle traffic correlated with high levels of bicycle commuting. To a lesser extent, bicycle commuting was affected by the relative costs of different modes of travel. These findings support observations that high levels of bicycling and walking are more likely in communities which have safe places to ride and a high cost of operating an automobile. This 1983 study cautioned, though, that building more safe places to ride would not necessarily increase bicycle use.

Taking a broader approach, the Minnesota Department of Transportation has used data provided by the Worldwatch Institute on levels of bicycling in cities worldwide to support its conclusion that **public policy** is the key to maximizing bicycle use. The Minnesota Bike Plan attributes the State's high level of bicycling to strong State and local programs over the past 15 years. A report by the State's Transportation Study Board concluded the following:

Affirmative public policy and government support are major factors which increase bicycle use. Having the infrastructure required for the convenient use of bicycles is of greater influence than weather or standards of living.²³

Adequate facilities appear to play a vital role in the decision to walk or ride a bicycle rather than drive an automobile. However, facilities alone are not sufficient to guarantee high levels of bicycling and walking. People will continue to choose not to bike or walk because they perceive these modes to be unsafe, too physically demanding, or inefficient, or because they feel that others will view them as "unprofessional" or "uncool." Overcoming negative perceptions and fostering support for nonmotorized transportation are important components of any effort to create an environment conducive to bicycling and walking.

Reasons for not bicycling or walking are varied, and no single approach will result in significant increases. A coordinated approach involving several components is required: public education, promotional campaigns, facility development, and supportive public policy. Chapter Two of the National Bicycling and Walking Study presents a comprehensive approach to increase levels of bicycling and walking.

ADDITIONAL INFORMATION NEEDED

There are serious limitations to current knowledge about levels of bicycling and walking in the United States. The U.S. Census, for example, collects data only in March and only for adults currently in the work force. The NPTS is broader in scope, but provides only national estimates that are not as useful to individual States and communities. Reconciling the various estimates is also a problem. Obtaining reliable walking data is particularly troublesome, partly because people do not identify themselves as pedestrians and are more likely to under report pedestrian trips. Additional research is needed to **identify the best ways to collect information on levels of bicycling and walking, and to determine the best approach for deriving appropriate national estimates of these activities.**

Research is also needed to **clarify and prioritize the reasons bicycling and walking are not better used as means of transportation.** What is the likely impact of adding a marked bicycle lane, of implementing an employee incentive program, of increasing parking fees for automobiles? What would be the effect of a combination of such factors? What other factors--such as size of community, terrain, population density, and target audience characteristics--need to be taken into consideration? And, perhaps most importantly, what is the best way to go about collecting such data?

There is a need to **differentiate between communities with high and low levels of bicycling and walking.** Many high-use communities are college towns, but do other factors differentiate them from low-use communities? How does public policy affect levels of bicycling and walking? What is the role of land use planning? Do facilities make a community suitable for bicycling and walking, or does something else need to come first? What can be learned from communities with high levels of bicycling and walking? Answers to these questions are the key to increasing levels of bicycling and walking in the future.

APPROACHES TO COLLECTING THE NEEDED INFORMATION

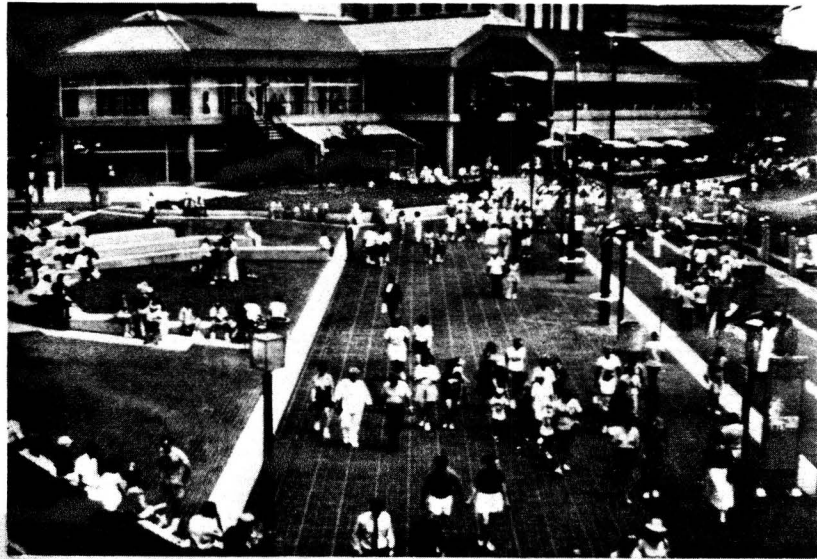
Four proposed case studies will address the research needs identified above. These are as follows:

- A study of the reasons bicycling and walking are and are not being used as travel modes.
- A study of usage data on bicycles: how is it obtained and how should it be obtained?

- A study of usage data on walking: how is it obtained and how should it be obtained?
- A study of the training needs for transportation professionals relating to bicycling and walking.

CHAPTER 2

PLAN FOR INCREASED USAGE



INTRODUCTION

The Honorable James L. Oberstar, U.S. House of Representatives, stated in a recent speech: "It is time, and past time, to bring the bicycle--and the human foot--into their rightful roles as means of commuting to work." Chapter One discussed current levels of bicycling and walking as well as the reasons bicycling and walking are not widely used as means of transportation. Based on these reasons, this chapter focuses on **measures to increase use of bicycling and walking**. The risks associated with bicycling and walking are also considered, and **measures to increase the safety of these modes** are discussed. Finally, a **framework for State and local plans** to increase bicycling and walking is included.

The following is an overview of what is currently known about increasing the use of bicycling and walking, enhancing safety, developing a plan, and identifying resources.

AVAILABLE INFORMATION

Measures to Increase Bicycling and Walking

As discussed in Chapter One, many psychological and physical barriers hamper walking and bicycling, including concern for personal safety, lack of facilities, and great travel distances. Numerous strategies have been used by local and State jurisdictions to convince travelers to switch from motor vehicles to bicycling or walking for some trips.

Landscaping along a bicycle path.



One of the most effective measures to encourage nonmotorized travel is to develop bicycle and pedestrian environments which are scenic, attractive, and enjoyable. Visual exposure to trees and vegetation can promote relaxation, recovery from stress, and improve the quality of life.²⁴ The Walking Magazine characterizes great walking cities as those with:

destinations within a 15- to 20-minute walk of each other. . . Pedestrian-level stores mixed with residences and businesses. Varied architecture. Diverse neighborhoods and a lively street life energized by sidewalk vendors, entertainers, and window-shoppers . . . filled with open spaces and parks. . . widened sidewalks, auto-restricted zones, and amenities such as benches, signs, and fountains.²⁵

Other incentives for walking and bicycling and disincentives for motor vehicle use have also been identified. These include:

- Pedestrian and bicycle facilities, such as wide sidewalks leading to points of interest, overpasses, interesting pathways, and well-designed bicycle lanes and paths. Note that collisions and other problems can occur when pedestrians and bicyclists attempt to use the same sidewalk or path, because of their different speeds.



Seattle buses offer bicycle racks.

- Compact land use where relatively short travel distances make bicycling or walking more practical.²⁶ Careful urban planning and development are needed to retrofit existing cities and suburbs toward more compact land use.
- Bicycle parking facilities such as bike racks or lockers at work sites, shopping centers, and transit stops. These facilities should be located near existing security cameras or attendants to avoid the need for additional security.
- Bicycle access to public transport to increase bicycle use and transit ridership. Bicycling accounted for up to 15 percent of all trips to Japanese rail stations. At some German rail stations, 43 percent of trips to the stations were made by bicycle.²⁷
- Special pedestrian and bicycle events, tours, and promotion programs.
- Bicycle maps and touring guides.
- Improved planning of current and future public transit routes to develop connections for bicyclists and walkers.
- Corporate and political support.
- Showers and lockers provided at places of employment to encourage bicycling and walking to work. For example, the City of Boulder, Colorado, will provide shower and changing facilities as city buildings are renovated or constructed.²⁸
- Reimbursement for bicycle travel on official business. According to a study by the General Accounting Office, reimbursement of four cents per mile is recommended for costs of bicycle travel for the Federal government.²⁹
- Use of a road as a bikeway or pedestrian mall on either a permanent basis or on a temporary basis for all or part of a day.

Reducing motor vehicle travel by disincentives does not always translate directly into an increase in bicycling and walking trips. Some people will choose public transit instead. In other cases, trips will not be taken, particularly when distances are too far to bike or walk, or in severe

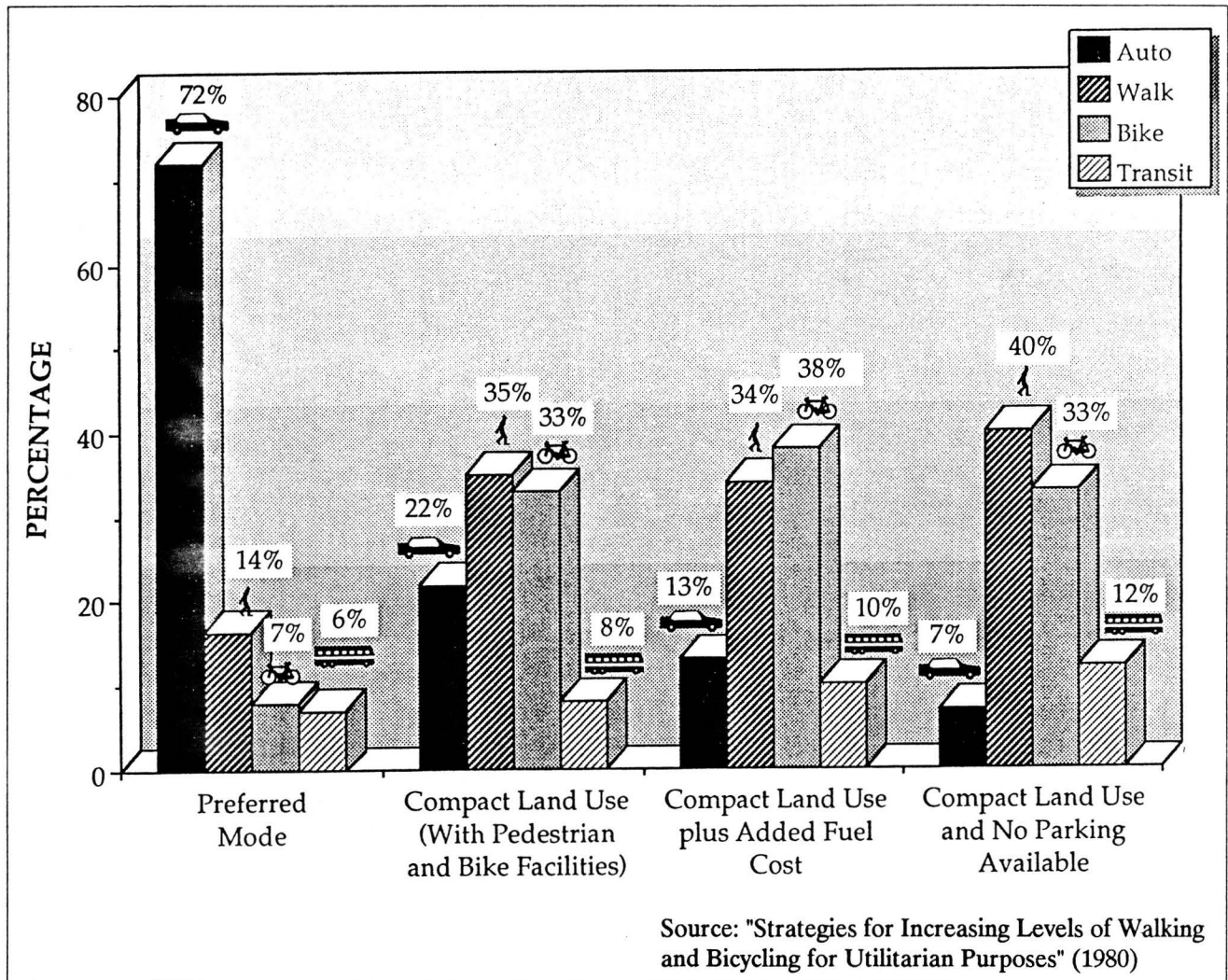


Figure 5. Modal preferences for work trips under various conditions.

weather. Incentives to bicycling and walking should target all age groups, including older adults -- a group that is growing substantially in the U.S.

Although little is known about the effects of many incentives, information is available on (1) improved pedestrian facilities, (2) improved bicycle facilities, (3) fees on automobile use, (4) compact land use, and (5) increased fuel prices. Of these five, compact land use combined with pedestrian and bicycle facilities has the greatest potential for a shift to bicycling and walking. Next in importance are pedestrian and bicycle facilities alone.³⁰

A peak-hour fee would reduce automobile use, but up to one-half of those trips would be diverted to public transit. The least effective

strategy is increasing the price of fuel. These conclusions are based on extensive attitudinal surveys of motorized and nonmotorized travel in five U.S. cities: Austin, Texas; Columbus, Indiana; Denver, Colorado; Huntington Beach, California; and Philadelphia, Pennsylvania.³¹

Figure 5 shows the effects of various incentives on modal choice for work trips. Under current conditions, 72 percent of work trips are preferred by automobile, with only 14 percent by foot and seven percent by bicycle. Situations where compact land use exists together with pedestrian and bicycle facilities were also evaluated. In this case, auto use would drop to 22 percent, walking would rise to 35 percent, and bicycling would rise to 33 percent. The combination of compact land use and increased fuel cost would drop auto use to 13 percent, increase walking

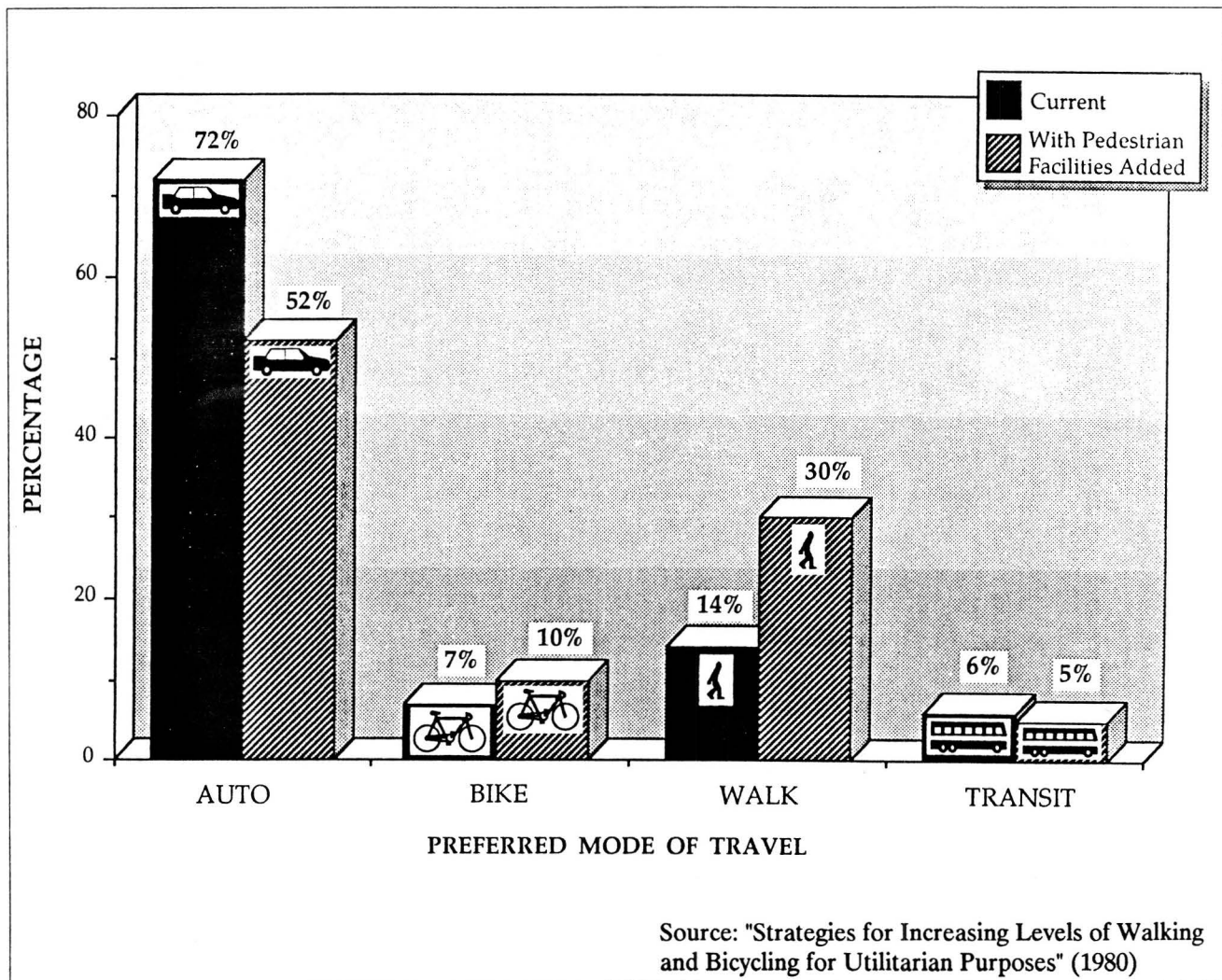


Figure 6. Preferred mode of travel for work trips when pedestrian facilities are added.

to 34 percent, increase bicycle use to 38 percent, and increase transit use to ten percent. Compact land use with parking restrictions would reduce auto use to seven percent, increase walking trips to 40 percent and bicycle trips to 33 percent.

Adding pedestrian facilities in the five cities surveyed would decrease motor vehicle work trips from 72 to 52 percent, as shown in Figure 6. Walking would increase from 14 to 30 percent, and bicycling would increase from seven to ten percent, possibly since some bicyclists would use the pedestrian sidewalks and paths. If separate bicycle lanes or paths were added, bicycle trips would increase from seven to 18 percent (see figure 7), while walking trips would increase from 14 to 17 percent, as some pedestrians would walk on the bicycle paths. Thus, adding

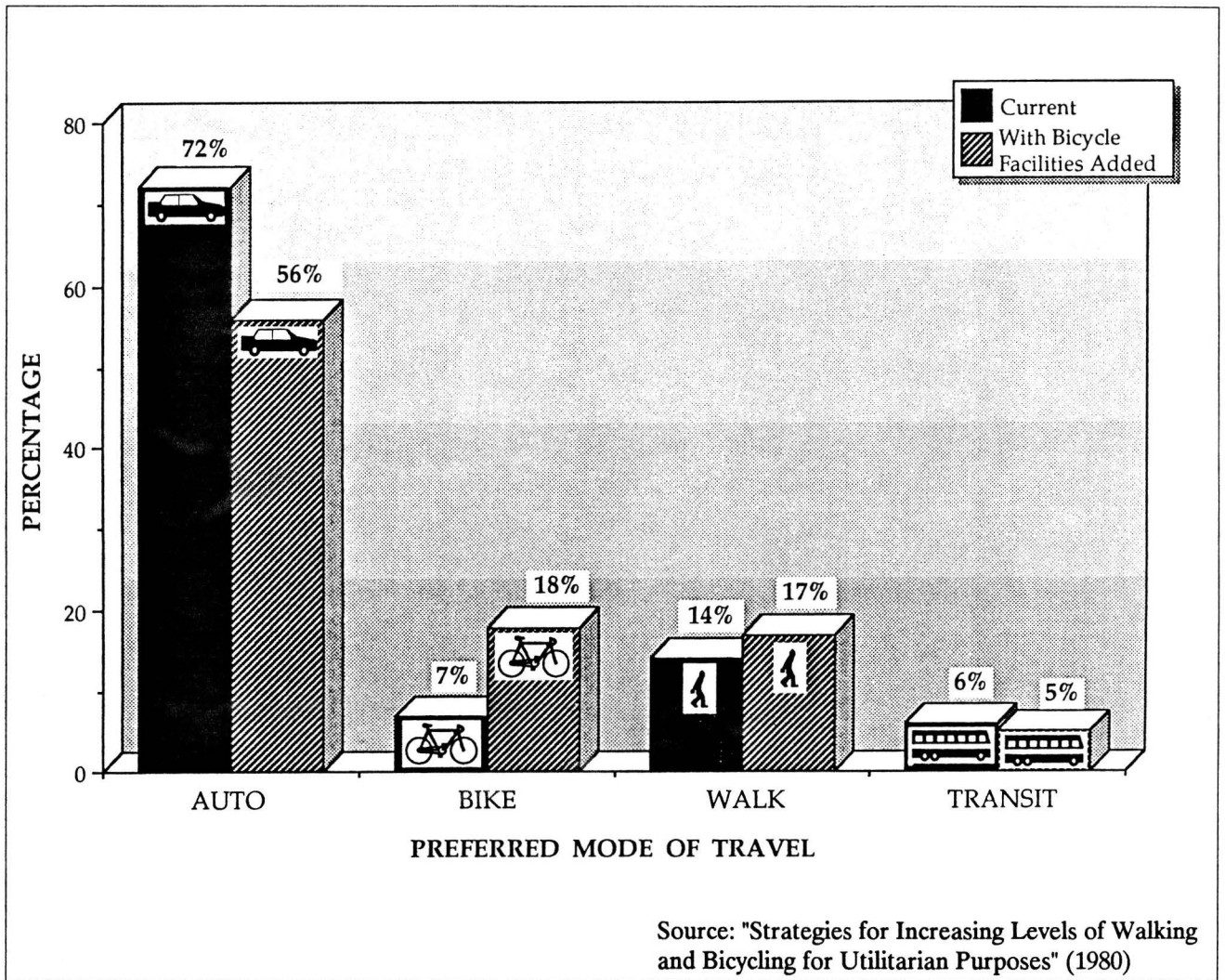


Figure 7. Preferred mode of travel for work trips when bicycle facilities are added.

pedestrian and bicycle facilities would increase walking and bicycling, and combining these facilities with a compact land use would result in substantial shifts from auto use.

Measures to Enhance Safety

As with all modes of transportation, bicycling and walking involve risk. In most street and roadway environments, pedestrians and bicyclists are vulnerable to serious injury or death if struck by a motor vehicle. Each year in the U.S., about 900 bicyclists and 6,500 pedestrians are killed, and tens of thousands are seriously injured in crashes with motor vehicles. Studies have estimated that risk may decrease with extensive separate facilities for walking or bicycling, combined with education and enforcement programs.³² Fatality rates are also lower for competent adult bicyclists, and when helmets are used.

The lack of reliable exposure data (related to mileage, for example) makes it difficult to quantify the precise level of risk (as accidents per mile) to pedestrians and bicyclists. Statistics on injuries and deaths caused by collisions between bicyclists and other bicyclists or pedestrians are also not readily available, whether the collisions occur on public highways or on separate pedestrian or bicycle facilities. Also, there is often a difference between actual safety and safety as perceived by bicyclists and pedestrian in various situations. Better quantification of levels of bicyclist and pedestrian risk is needed.

Common types of crashes involving pedestrians and bicyclists have been defined for use in accident classification and selecting appropriate safety improvements. Of major importance in safety enhancement are active spot improvement programs by State and local agencies. The programs should include quantifying the extent of pedestrian and bicycle accidents, selecting the best alternatives for reducing the problem, and implementing selected alternatives. Effectiveness of the alternatives should be evaluated as the safety programs are maintained.³³

It is important to consider pedestrians and bicyclists as separate groups with different characteristics and needs. For example, bicycle speeds approach those of motor vehicles in urban areas, and bicyclists in the travel lanes should move in the same direction as motor vehicles. Pedestrian movement along roadways is safest when separated from motor vehicles and bicyclists, but pedestrians should face traffic where no sidewalks or walkways are available. Efforts to increase the population



Bicycle route sign.

of walkers and bicyclists must include measures to provide an acceptable level of safety.

Nonmotorist safety is influenced by the physical facilities, roadway characteristics, condition of the bicycles and motor vehicles, actions of all modes of travel, and environmental factors. Safety enhancement measures may be classified as follows:

- Bicycle facility improvements.
- Pedestrian facility improvements.
- Pedestrian education programs.
- Bicyclist education programs.
- Pedestrian and bicyclist visibility.
- Motorist education and training.
- Enforcement and regulations.

These topics are discussed individually below.

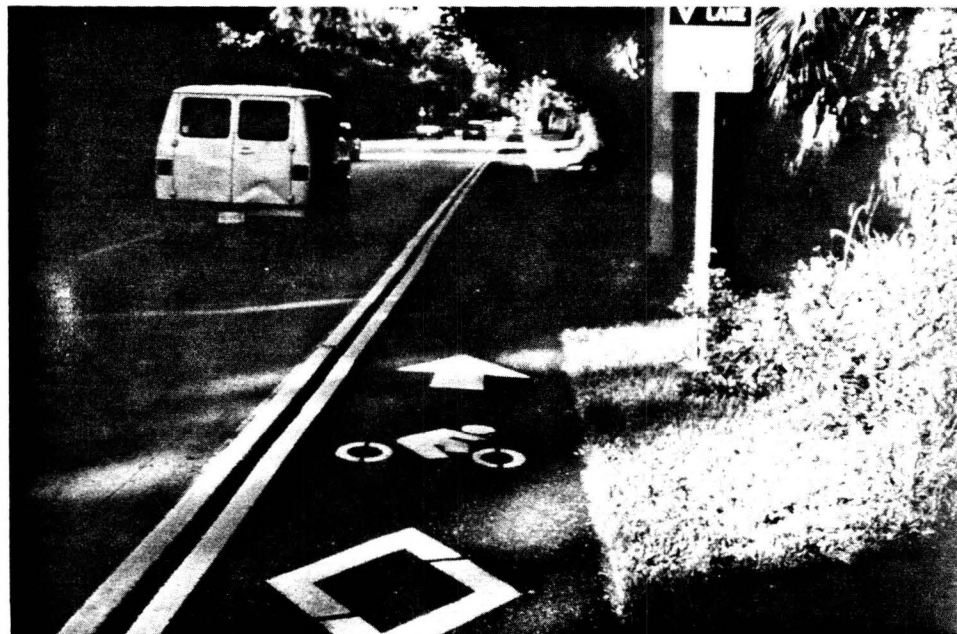
Bicycle Facility Improvements. The publication Bicycle Transportation for Energy Conservation states that

[t]he Congress recognizes that bicycles are the most efficient means of transportation, represent a viable commuting alternative to many people, offer mobility at speeds as fast as that of cars in urban areas, provide health benefits through daily exercise, reduce noise and air pollution, are relatively inexpensive, and deserve consideration in a comprehensive national energy plan.³⁴

Increasing bicycle use as a transportation mode requires adequate facilities for bicyclists to use. Meeting this need begins by providing a comprehensive system of bicycle-safe and "friendly" roads and streets. An estimated 80 percent of bicycling takes place on regular streets and highways.

The term "bikeway" refers to any road or path which is designated as being open to bicycle travel, regardless of whether or not it is for exclusive bicycle use. Thus, the general term "bikeway" could include bicycle routes, bicycle lanes, and/or bicycle paths. These three basic categories of bicycle facilities are described below:³⁵

Striped bicycle lane.



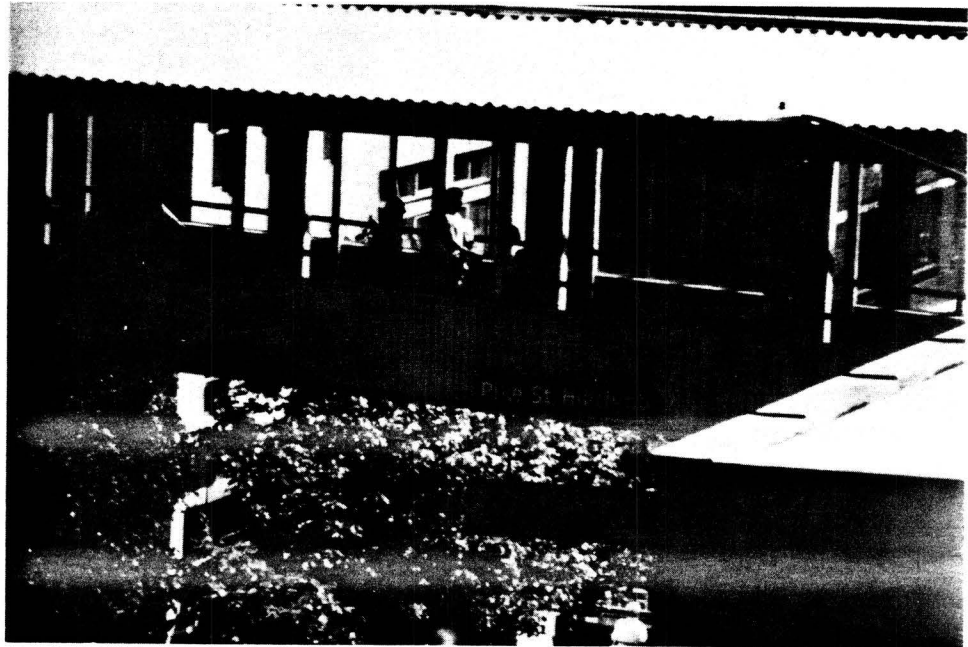
- Bicycle route - a road which is designated for bicycling through signage, where bicyclists share the road with other vehicles.
- Bicycle lane - a separate lane on the roadway which has been designated by striping, signing, and pavement markings for the preferential or exclusive use by bicyclists.
- Bicycle path - a physically separated facility with exclusive right-of-way and with minimal cross flows by motor vehicles. Bicycle paths can include park trails and abandoned rail corridors.

Many miles of bicycle paths have been constructed from abandoned rail corridors. Such paths often provide high-quality transportation routes which are economical and have fewer conflicts with motor vehicles compared with other bicycle facilities.³⁶

The addition of bicycle facilities generally increases usage along a route, sometimes by diverting bike traffic from other routes. However, not all safety implications of each facility type are known. There is also controversy over the issue of removing bicyclists from roadways versus integrating bicycles into the existing traffic stream. More research is needed to better quantify the safety and operational effects of such facilities.



Separated bicycle facility.

Pedestrian overpass.

Many other types of street improvements can promote bicyclists' safety and convenience. Examples from various State and local bicycle spot improvement programs include:^{37,38}

- Wide lanes and paved shoulders in rural areas to provide adequate room for bicyclists and motor vehicles.
- Bicycle-safe drainage grates, or drainage grates outside the lane-sharing area.
- Improvements to remove surface problems, such as:
 - Filling potholes.
 - Providing anti-skid treatment on exposed metal surfaces.
 - Improving drainage to reduce surface ponding.
 - Making railroad grade crossings as smooth as possible.
 - Maintaining a smooth roadway surface, including resurfacing and repairing pavement joints when needed.



Facilities to accommodate wheelchair users benefit bicyclists and pedestrians as well.

- Bicycle-sensitive detectors or push-buttons at signalized intersections.
- Guardrail and sign post placement that does not interfere with bicycle travel.
- Bicycle route signs at decision points and warning signs near unavoidable obstructions.
- Roadway striping to aid bicyclists.
- Reduction of protrusions at traffic islands.
- Asphalt connector paths from existing streets to bicycle trails and facilities.

The City of Seattle has converted some four-lane arterials to two traffic lanes with a center turn lane. The extra width is used to create bicycle lanes or wide curb lanes. This improvement can reduce speeds of motor vehicles, which aids pedestrians in safely crossing the street, reduces certain types of motor vehicle crashes, and improves access to adjacent businesses, without a substantial drop in highway capacity.

Pedestrian Facility Improvements. As stated in A Manual for Planning Pedestrian Facilities, "[f]rom the earliest recorded history when the use of paths by people on foot was first challenged by people on horses, to the present when the pedestrian is often at the mercy of the motorist, the rights of pedestrians have declined. In many present day environments, coexistence to a pedestrian means the risk of personal injury, the inconvenience of delays created by barriers of vehicles, and the discomfort of automotive noise and fumes."³⁹

Pedestrian facilities both encourage people to walk and improve pedestrian safety along certain routes. The facilities must be well-designed and maintained to be effective, and must include the following features:^{40,41}

- Widened paved shoulders to allow safer travel for pedestrians.
- Sidewalks, paths, or walkways which are wide, relatively clear of obstructions, and separated from traffic lanes.

Pedestrian mall.



- Grade-separated pedestrian crossings which are clearly justified, since such facilities go unused by pedestrians if not properly planned, designed, and located.
- Pedestrian malls which are well-planned with respect to commercial development, traffic circulation, and visual appeal.
- Proper design and operation of traffic and pedestrian signals, including pedestrian push-buttons, where appropriate.
- Traffic calming techniques, such as narrowed streets to lower vehicle speeds and create safer pedestrian crossing, cul-de-sacs, and limiting motor vehicle speeds or movements.
- Barriers that physically separate pedestrians from motor vehicle traffic at selected locations.
- Prohibiting curb parking, especially near intersections.
- Lighting of streets, walkways, and bicycle paths.
- Facilities for the people with mobility and visual impairments, including curb ramps, audible pedestrian signals, longer WALK intervals for slower pedestrian walking speeds, and clearing sidewalks of poles and street furniture.
- Signing and marking, including pavement edgelines and pedestrian warning signs where needed.
- Adequate provisions for pedestrians and bicyclists in highway work zones.

Although the effects on pedestrian accidents of many of these improvements are unknown, some have proven safety benefits. For example, sidewalks reduce pedestrian accidents in residential and business areas and provide a paved play area for children who may otherwise play in the street.^{42,43} When properly located over high-speed roadways, grade-separated crossings provide access between neighborhoods and shopping areas or schools. As reported in a Japanese study, they can reduce pedestrian accidents up to 90 percent. Lighting of pedestrian crosswalks decreased nighttime pedestrian accidents by 59 percent according to one Australian study.⁴⁴

Helmet fit is important

Pedestrian Education Programs. Pedestrian safety is affected by educational and training programs. For example, two films developed by the National Highway Traffic Safety Administration (NHTSA) teach children the correct procedure to safely cross streets. A program called **WILLIE WHISTLE** reduced about 30 percent of midblock dart-and-dash accidents for children in grades K through 3. Another educational program, **AND KEEP ON LOOKING**, reduced collisions by more than 20 percent among children in grades four through seven. These programs were tested in Los Angeles, Columbus, Milwaukee, and Seattle.^{45,46} Many other pedestrian educational programs have not been formally evaluated.

Various localities in the U.S. and abroad have developed films, pamphlets, recorded messages on buses, and public awareness campaigns aimed at adults, including programs in Pittsburgh; Stamford, Connecticut; New York City; Salt Lake City; and throughout England.⁴⁷

Some positive effects were noted in pedestrian behavior and accident rates for several of the programs, although not all resulted in measurable improvements.

Bicyclist Education Programs. Bicyclists need to stay alert at all times since they must interact with pedestrians, cars, and other bicycles. Bicycle crashes are a leading cause of injury to children. Each year, 600 children die from bicycle crashes and thousands more are seriously injured. Three out of four children fatally-injured in bicycle crashes die as a result of head injury.⁴⁸ Based on a study at five Seattle-area hospitals, helmets reduced the likelihood of head injury by 85 percent.⁴⁹ Current rates of helmet use are low among school-age children, and the success of programs to increase helmet use depends on the types of training given.

Bicycle safety education programs can reduce injuries and fatalities by teaching people to ride safely and competently in traffic and by encouraging the use of appropriate safety equipment, particularly helmets. "The Basics of Bicycling," a bicycle safety education curriculum for elementary school children, consists of lessons on using appropriate equipment, checking bike condition, obeying traffic laws and signs, dealing with high-risk situations, communicating and cooperating with other road users, and following proper bicycle handling skills. A field assessment of this program in North Carolina indicates that a bicycle education program can be successfully implemented in an elementary school setting.⁵⁰

Pedestrian and Bicyclist Visibility. The risk of a motor vehicle accident with a pedestrian or bicyclist is greater at night than during the day. Increased visibility of the pedestrian or bicyclist is important in reducing nighttime accidents. Reflective devices substantially improve visibility. Pedestrians can be detected at the greatest distance by oncoming motorists if they are carrying a flashlight (1,379 feet) or wearing retroreflective rings or jogging vests (750 feet). A pedestrian wearing white cannot be seen until the motorist is about 224 feet away. Thus, simply wearing "white at night" is not enough to ensure safety.⁵¹

For bicyclists, nighttime visibility is greatest for leg lamps worn on the bicyclist's ankle (1,303 feet) or fluorescent triangles and ankle bands worn by the bicyclist (957 feet). Walking and bicycling are considerably safer after dark with the use of reflective devices and lights.⁵² Equipment such as spoke reflectors, headlights, and bicycle bells and horns are also beneficial for safety.

Motorist Education and Training. As discussed earlier, many people are afraid to walk or bicycle on or near roadways because of the attitude of motorists. The key to motorist education is to increase their understanding and respect for the rights of nonmotorized traffic. Although motor vehicle drivers, bicyclists, and pedestrians are required to obey certain traffic laws and ordinances, the motor vehicle driver is responsible for all necessary precautions to avoid striking a bicyclist or pedestrian.

Several sources of educational information are available for drivers in this regard, including State driver's license manuals with information on legal and proper driving behavior near nonmotorized road users. The National Safety Council's Defensive Driving Course emphasizes that drivers must take added precautions when approaching children, older adults, people walking or bicycling at night, and those under the influence of alcohol. The **Walk Alert** Program Guide outlines safety messages for drivers which can improve pedestrian safety.⁵³

Other educational materials are also targeted at drivers and the general public, including a West German film, Children in Traffic - Why Are They Different, that shows drivers how children differ from adults in their perceptions of and reactions to traffic. A public service announcement entitled Give Older Pedestrians a Break at Crossings was developed by the American Automobile Association to remind drivers to give older pedestrians time to complete their crossing before proceeding through intersections.⁵⁴ Although these motorist education and training programs convey important messages, their effect on pedestrian and bicycle safety is not known.

Enforcement and Regulations. In addition to engineering and education, enforcement of traffic laws and regulations represents an important ingredient for safe bicycling and walking. This includes enforcing pedestrian regulations, such as those which prohibit jaywalking and crossing against traffic signals, and bicycle regulations, including those related to disobeying traffic controls, running stop signs, and riding on sidewalks where prohibited. Unlawful motorist actions which place pedestrians and bicyclists in danger include exceeding the speed limit, failing to yield to pedestrians and bicyclists when turning, running stop signs and traffic signals, failing to share the road with bicyclists, and many others.

Strong police enforcement programs are needed to reduce violations and increase driver awareness of pedestrians and bicyclists. In some

cases, revisions to local traffic rules may be needed to promote and encourage safer bicycling and walking. The effects of enforcement alone are difficult to quantify properly because of the many factors affecting bicycle and pedestrian accident experience. However, many cities, such as Milwaukee, Seattle, and San Diego, that have exemplary pedestrian and bicycle safety achievements, have maintained active enforcement in combination with other program elements.⁵⁵

Framework for State and Local Plans

According to Dr. Thomas Larson, Federal Highway Administrator, "[b]icycling and walking are two overlooked options in our transportation mix." Therefore, the first step in planning for nonmotorized travel is to recognize walking and bicycling as important transportation modes at the local, State, and national levels. Bicycle and pedestrian needs should then be made a part of State and local transportation plans, which must be comprehensive to be successful, since one short bike path, for example, will not divert a large number of people from their cars to bicycles.⁵⁶ The constituency of bicyclists and pedestrians and their characteristics must be defined so that the plan can best fit their needs.

According to a 1980 report by the U.S. DOT, comprehensive State and local bicycle transportation programs aimed at increasing bicycle use should have the following goals and elements:⁵⁷

- Goal 1 - Improve operator awareness and competence (bicyclists and motorists).
 - Make comprehensive bicyclist education/training to adults.
 - Implement public awareness/information programs.
 - Implement motorist information programs.
 - Increase selective enforcement of traffic laws.
 - Provide incentives for bicycling.
- Goal 2 - Improve institutional and professional responsiveness.
 - Increase the availability of funds to support a bicycle program.
 - Develop standards and guidelines for bicycle facilities.

- Integrate consideration of bicycle transportation into government planning activities.
 - Improve coordination of bicycle transportation activities.
 - Increase the acceptance of bicycle transportation by transportation professionals.
 - Increase the knowledge of bicycle programs among transportation and related professionals.
- Goal 3 - Improve the transportation system for bicyclists.
- Eliminate roadway surface and design hazards.
 - Improve bicyclists' access by mitigating the effects of "bottlenecks."
 - Provide secure bicycle parking facilities.

Although the information above relates to a comprehensive bicycle plan, many of the same objectives and elements apply to pedestrians. Specific local and Statewide plans and programs are discussed in Chapter Four.

Some State and local agencies are becoming more assertive and creative in obtaining resources for bicycling and walking. Federal funds are available for bicycle and pedestrian facilities and programs. Many improvements are tied to the funding of other programs, such as capital improvements for street reconstruction and private developments. In New York City, for example, street repaving programs primarily for motor vehicles also promote increased bicycle travel, since bicyclists are attracted by a smoother, safer, and more pleasant ride resulting from the new surface.

The business community can also be an integral component of a local plan by providing resources to promote bicycling and walking. Development of a comprehensive plan for pedestrians and bicyclists is the key to unlocking such funding opportunities.

This chapter focused on what is known about measures for increased use and safety of bicycling and walking. However, little is yet known about the effects of programs and improved facilities. For example, **more information is needed on promotion programs and improved facilities including their potential effects on bicycling and walking. Strategies and funding mechanisms** to overcome some of the impediments to bicycling and walking need to be identified.

Other issues to be addressed include **clearer definition of the components of a successful movement to improve bicycling and walking. Safety** benefits (and disbenefits) of increased bicycling and walking must be quantified. Also, to promote a more coordinated transportation network, **the feasibility and mechanics of linking transit with bicycle and pedestrian facilities** must be identified.

ADDITIONAL INFORMATION NEEDED

The National Bicycling and Walking Study includes several specific case studies to address plans for increased use and safety of bicycling and walking. The case studies include:

- From marketing analyses, determine ways to promote bicycling and walking, to include employer-based programs.
- Identify trip generation rates for different bicycle and pedestrian facilities.
- Identify measures to overcome impediments to bicycling and walking.
- Analyze current funding mechanisms for bicycle and pedestrian programs at the Federal, State, and local levels.
- Analyze successful "grass roots" movements relating to pedestrians and bicycles and develop a guide on how to initiate a successful program, including successful community plans for bicycling and walking.
- Evaluate safety effects of bicycling and walking to include:
 - Safety trends over time.
 - Development of bicycle and pedestrian accident rates.
 - Safety of different facility types.

APPROACHES TO COLLECTING THE NEEDED INFORMATION

- Perceptions of safety by potential and actual users and by motor vehicle drivers and how to deal with these perceptions.
- Examples of successful bicycle trails and pedestrian paths that have increased commuting.
- Identify transportation potential and other benefits of off-road bicycle and pedestrian facilities.
- Study linking bicycle and pedestrian facilities with transit.

CHAPTER 3

COSTS AND BENEFITS



INTRODUCTION

The benefits and costs of the measures and program components discussed in Chapters 2 and 4 are summarized in this chapter. Benefits and costs are found to be related to the size of a community and its development patterns. Benefits from bicycling and walking include increased health and fitness, an improved environment, and a more cost-effective use of the existing transportation system. Costs include those needed to construct and operate facilities as well as to develop and implement educational and promotional programs.

AVAILABLE INFORMATION

Information on benefits and costs has been derived from previous studies and several State transportation departments' documents. Costs have been related to the various types of measures that could be implemented and facilities that could be constructed. They are discussed in both quantitative (dollar amounts) and qualitative terms.

Estimated costs include those required to construct and maintain physical facilities such as bike paths, pedestrian sidewalks, grade separation structures, landscaping, lighting, and similar improvements. Only relative costs have been noted for educational programs and promotional campaigns because of the variation in what is included. Costs of planning and institutional options are part of the total costs of those specific projects and are highly variable.

While costs are related to specific facilities, benefits are identified at the general community level. Increased bicycling and walking could have environmental benefits, such as helping communities meet the Clean Air Act standards. Physical facilities could enhance the transportation system by providing a means of travel to those without a motor vehicle. These facilities could be added to the existing transportation system.

The best way to maximize benefits and minimize the costs of these measures is to develop a continuing program to institutionalize pedestrian and bicyclist needs into the transportation planning process. Providing facilities and other measures on a system-wide basis is most effective in promoting bicycling and walking when considered in conjunction with auto and transit modes. Also, the most cost-effective approach is for facilities to be incorporated in a system-wide plan at the beginning, rather than having to be added later.

Benefits

Increased walking and cycling would result in benefits to the health and fitness of individuals, to the environment, and to society. The principal benefits identified are:

- Improved fitness and exercise.
- Reduced health care costs.
- Increased aesthetic enjoyment.
- Enhanced sense of neighborhood.
- Increased options for those with or without motor vehicles.
- Reduced traffic congestion.
- Reduced fuel consumption and cost.
- Reduced air pollution.
- Reduced vehicular noise.
- Avoided costs for roadway improvements.

These benefits fall into two main categories--those inherent in the activity of walking and bicycling and those resulting from reduced automobile usage. The first five benefits fit into the former category and the last five into the latter.

Improved Fitness and Exercise. Bicycling and walking are two forms of exercise that people of all ages can do. Fitness benefits of bicycling and walking can be categorized in two ways: physiological and psychological.

Physiological benefits include elevated heart rate, leading to increased endurance and reduced blood pressure; the burning of calories, which aids weight control; and increased strength and muscle tone. The National Heart Institute reported that cardiovascular disease from the lack of vigorous exercise was the major killer for males under the age of 65.⁵⁸ Bicycling and walking also allow a person to exercise while traveling to a destination, achieving two goals simultaneously.

Psychological benefits include stress reduction through an enjoyable ride or walk away from traffic congestion, the experience of being outside and getting fresh air, and a sense of achievement from moving under one's own power.

These benefits must be weighed against the possible contrary effects of increased fatigue, exposure to air pollution (particularly carbon monoxide), and psychological stress if vehicles or excessive noise are

More people choose to walk or bike on aesthetically pleasing paths.



present. The impact of a biking or pedestrian facility on human health should be assessed in terms of those elements that contribute or detract from the physical and mental well-being of its users.

Reduced Health Care Costs. A healthy society would reduce health care costs for everyone. Furthermore, healthy employees and students would reduce absenteeism at work and school.

Increased Aesthetic Enjoyment. The aesthetic benefits result from cycling and walking on attractive facilities that have scenic views. On a nature trail or a well-landscaped street or pathway, the cyclist or walker will experience a reduced level of stress enjoying the beautiful environment. Careful design of the facilities, particularly those involving structures in urban areas, is important to enhance their use and appearance.

Enhanced Sense of Neighborhood. Bicycling and walking promote community cohesion and appreciation. Taking a stroll or ride through the neighborhood allows one to learn more about the community and meet neighbors, which can promote community pride. Biking and walking facilities could also provide easier access to reach local shopping and entertainment centers such as theaters and parks as well as to friends and neighbors.

Reduced Air Pollution. States and communities are required to meet the new, tighter restrictions on air quality included in the 1990 Clean Air Act. Auto emissions are a leading cause of air pollution. The diversion of motor vehicle trips to bicycling and walking would reduce air pollution and assist the communities in meeting these new standards. Bicycling and walking would complement other measures which State and local communities will need for controlling air pollution.

This benefit would be enhanced by the type of trips diverted (slower, shorter trips), which tend to be the "dirtiest." Emissions of carbon monoxide and hydrocarbons are greater at slower speeds. To determine the air quality benefit, the average emission factors for the diverted trips must be determined. The standard vehicle mix includes primarily light-duty gas cars and trucks (92 percent of the total) with only a small percentage of diesel vehicles. These light-duty gas vehicles contribute 70 to 90 percent of all emissions, depending on the pollutant.

Reduced Vehicular Noise. While noise levels can be measured and computed for volumes of traffic, estimating the noise decreases from the reduction of a few vehicles is not as easy. Also, a minor change in noise levels may go virtually unnoticed by nearby property owners. A large component of traffic noise is from large trucks, which may be relatively unaffected by shifts from auto use to bicycling and walking. Still, a reduction in vehicular traffic does reduce noise.

Avoided Costs for Roadway Improvements. With reduced motor vehicular usage, fewer roadway improvements such as building new roads or increasing roadway width would be necessary. The money saved from these expenditures could be directed toward bicycle and pedestrian facilities.

Disbenefits

In addition to benefits (positive effects), some "disbenefits" (negative effects) could potentially occur with increased walking and bicycling. Disbenefits are contrary effects, or secondary "costs," associated with the implementation of a particular facility or measure. They could include:

- Increased travel delay for motorists.
- Reduced transit revenues.
- Displacements and community intrusion.
- Conflict between walkers and bicyclists.
- Increased conflict with motorized vehicles.

These are the principal disbenefits that might occur. However, each situation would have to be evaluated individually to assess which, if any, disbenefits would occur with specific improvements.

Increased Travel Delay for Motorists. Certain improvements for bicycling and walking increase travel time for motorists, depending on the amount of interaction between the modes of travel. For example, motorists might face increased delays at a new signalized crosswalk or intersection.

Reduced Transit Revenues. New walkers and cyclists might have previously used transit--either bus or rail. This is particularly true for shorter trips. Consequently, the shift to bicycling and walking might decrease ridership on public transit systems, which would cause a reduction in transit revenues. In other instances, though, where access to transit stations is improved for walkers and cyclists, an increase in ridership could boost revenues.

Displacements and Community Intrusion. Providing pedestrian and bicycle corridors could cause displacement of homes or businesses. This is because some roadway improvements or widening projects or additions of new sidewalks or bike lanes could require additional right-of-way. Such displacement, however, would be site specific and could be minimized by alternative design options.

Conflict between Walkers and Bicyclists. Conflicts might arise between bicyclists and pedestrians on shared facilities, because of the different relative speeds, mobility, and reaction times between the two modes.

Increased Conflict with Motorized Vehicles. Increased pedestrians crossing at intersections or more cyclists on bicycle lanes incorporated as part of the street could result in conflicts with motorists. This is related to the increased travel delay mentioned above. Improvements such as bridges or overpasses could minimize such conflicts.

Costs

The successful completion of many tasks--from planning and construction of facilities through enforcement--is required to ensure an effective bicycling and walking program. Table 3 lists these tasks and associated cost components.



Facilities should provide for all users.

Although some concern has been expressed about privacy and security of homes along paths, studies have shown that land values of properties abutting trail systems actually increase, and trail access is listed as a benefit of real estate located near trails.⁵⁹ One alternative is to incorporate a path system into the initial community layout, such as in Reston, Virginia, and Greenbelt, Maryland. These pathways are now considered important elements of the community and contribute to the quality of life.

Increased Options for Those with or without Motor Vehicles. Facilities and measures to promote bicycling and walking would provide a means of transportation for many who do not or cannot travel by auto. Youngsters, senior citizens, and low-income groups would have greater access and expanded freedom to participate in more activities. Such measures and facilities include separate, protected pathways, pedestrian rights-of-way at intersections, skywalks in urban areas, and overpasses spanning major arterials in suburban or rural areas.

Reduced Traffic Congestion. Providing facilities and implementing other measures may shift people from motor vehicles to bicycling or walking. These shifts would reduce motor vehicle miles traveled (VMT), and would hence reduce traffic congestion, and result in more efficient use of the automobile. Several other benefits, including reduced energy consumption, reduced costs, improved air quality, and reduced noise, are based on the reduction of VMT.

According to one study, system-wide improvements are necessary to attract the most bicyclists and walkers.⁶⁰ The study predicted that bicycling trips would increase to five percent under the best conditions. Other studies have noted much higher potential shifts to bicycling and walking. A survey of five cities noted potential increases in biking and walking of 10 and 30 percent, respectively.⁶¹ The study also noted that of all modes of travel, the bicycle is the one whose preference is consistently greater than its use. This indicates that people would choose the bicycle if they considered it more convenient or safe. The 1991 Harris poll for *Bicycling* magazine noted a potential for up to 20 percent of all commuter trips to be made by bicycle, under the right conditions.

Reduced Fuel Consumption. The diversion of vehicular trips to bicycling and walking would reduce energy usage and oil consumption. In 1989, the average fuel efficiency was 20.5 miles per gallon (mpg) for all gas cars, 10.4 mpg for all gas trucks and vans, and 16 mpg for all gas vehicles (cars, trucks, and vans combined).⁶²

Those vehicular trips expected to be diverted would be the least fuel-efficient, thus increasing the benefit of reduced energy usage. The shorter the trip length, the less fuel efficient the trip is. For example, a trip of two miles would have a relative fuel economy of 7.3 mpg, while a trip of six miles would have a relative fuel economy of 13.6 mpg.⁶³ Other factors also affect gasoline consumption, including average speed, range of speeds, frequency of major speed changes, frequency of minor speed changes, engine temperature at start up, road surface, etc.

The scene in many cities:
traffic congestion.





Pedestrian overpass.

Bicycle and Pedestrian Facilities. Estimates of construction, operation, and maintenance costs of bicycle/pedestrian paths are provided in Tables 4, 5, and 6 as "rule-of-thumb" costs for planners. The costs would vary depending on location, site characteristics, materials, labor, and need for right-of-way acquisition. Costs are given for linear elements such as pathways, bikeways, grade separations, and lighting along pathways, and also for individual program elements such as intersection improvements or signals. These linear and individual elements can be implemented as discrete improvements or in combination as a system-wide improvement program.

Linear elements such as routes for bicycle paths and walkways are similar in many cases, except for width. Costs for such linear facilities can most conveniently be estimated on a per foot basis, as shown in Table 4. Depending on the particular improvement, several of the elements could be combined to determine the total cost. For example, a roadway widening could also include right-of-way acquisition, striping, and lighting.

Table 5 identifies construction costs for individual program elements such as traffic signals. Costs for facilities such as pedestrian malls (with street closures) are not listed because they depend on the particular design elements and utility improvements.

Table 2. Major Cost Elements of Facilities and Programs

Task	Cost Component
Planning	Personnel, planning studies
Construction of facilities	Pathways/sidewalks, bike paths/lanes, landscaping, lighting, signs
Improvement of facilities	Bicycle lockers, racks
Ancillary facilities	Showers, lockers, water fountains
Maintenance	Equipment, personnel
Monetary/time incentives	Tax credits, flexible schedule, reduction in length of work day
Educational and marketing programs	Teaching personnel, TV, radio and newspapers, printing and distribution of materials
Regulatory and enforcement programs	Personnel, police training

Source: Robinson, F.O. Feasibility of Demand Incentives for Non-Motorized Travel, Final Report, Report No. FHWA/RD-80/048, Federal Highway Administration, Washington, DC, April 1981.

Table 3. Construction Costs for Bicycle/Pedestrian Facilities Per 100 Linear Feet of Program Element

Item	Description	Unit Cost ¹
Right-of-way ²	20 ft wide	\$700
Base and pavement	For each foot of width	\$150
Widening of roadway	Widening of 3 ft	\$2,750
Widening of roadway with curb sections involved	Widening of 1 ft Widening of 2 ft	\$2,500 \$3,375
Widening of bridge	Widening of 3 ft	\$60,000
Striping		\$30
Barriers		\$160
Lighting		\$2,700
Landscaping	20 ft wide	\$1,850

Note: ¹ All costs converted from original to 1991 dollars using Consumer Price Index (CPI)

² Right-of-Way costs will vary widely.

- Source:
1. Robinson, 1981.
 2. Datz, John. Cost Estimates for Variable Widening for Bicycles. New Jersey Department of Transportation, Bureau of Design Standards and Economic Design Analysis, 1984.
 3. Lindley, Jeffrey A. Methodology for Evaluating the Feasibility of Grade-Separated Pedestrian Crossings. Transportation Research Record 1059, 1986.
 4. Podolske, Richard. Investing in Urban Bicycle Facilities. Transportation Engineering Journal, August, 1974.

Table 4. Construction Costs for Bicycle/Pedestrian Facilities Per Individual Program Element

Item	Description	Unit Cost ¹
Grade-separated intersection	Concrete conduit underpass, 10 ft diameter	\$153,000
At-grade intersection modification	Loop detectors for bicycles	\$61,200
Pedestrian bridge	180 ft long, 6 ft wide \$3,375/ft	\$607,600
Bicycle Grates		\$310
Stream Flow Grates		\$185
Bicycle Locker	Holds two bicycles, theft proof	\$550
Signing		\$60/sign
Pedestrian Signal		\$2,350

Note: ¹ All costs converted from original to 1991 dollars using CPI.

Source: 1. Robinson, 1981.
2. Lindley, 1986.
3. Podolske, 1974.

Table 5. Annual Maintenance and Operational Costs Per 100 Linear Feet of Element

Item	Description	Unit Cost
Landscaping	8 months/year, 20-ft wide area	\$370
Snow removal	2 snowfalls/month	\$0.20
Sweeping	Once a month; 5 mile/hour	\$38/hr
Repair: seal coat	6 ft path; on 5th and 15th year after construction	\$42/repair
Repair: resurfacing	6 ft path; on 10th year after construction	\$306
Barrier		\$65
Signal		\$220
Pedestrian bridge		\$20/ft width

Note: ¹ All costs converted from original to 1991 dollars using CPI.

Source: 1. Robinson, 1981.
2. Lindley, 1986.
3. Podolske, 1974.

In addition to these "actual" costs, "total" costs and cost effectiveness should be considered, including a review of how effective the measures are on travel efficiency. This would address the comparative cost of a facility and its person-carrying capacity per hour. A facility's cost effectiveness would be based on the number of people it could serve in a certain amount of time. For example, assume that a two-lane roadway costs \$1.0 million per mile and theoretically serves 1,600 autos with 2,000 people in one hour at 40 to 45 miles per hour (mph). A two-lane bike path costs \$100,000 per mile and could accommodate 4,000-5,000 persons in one hour at 12 to 15 mph. Right-of-way and other site conditions could increase these costs.

The following examples show how various linear and individual program elements can affect the costs.

Sunset Cliffs Bridge, San Diego River, San Diego, California: \$3.4 million for eight-foot wide sidewalks on each side of a quarter-mile-long bridge with bridge and median improvements at \$260,000 per 100 linear feet.⁶⁴

Kenmore/Bothell Bikeway, King County, Washington: \$1.1 million for ten-foot-wide paved pathway one mile long, including right-of-way signing, bridge crossing (120-foot span) at \$21,400 per 100 linear feet.⁶⁵

Burke-Gilman Trail, King County, Washington: \$510,000 for ten-foot asphalt pavement 1.16 miles long with lighting, rail and tie removal, and right-of-way at \$8,260 per 100 linear feet.⁶⁶

Other factors that could affect the construction cost, and consequently the cost effectiveness, are location (urban or suburban) and whether the improvements are new or are being made to existing facilities ("retrofit" projects).

Facility operation and maintenance costs are summarized in Table 6. The total cost can be derived by selecting the various elements needed for the particular facility and combining the costs. In addition to these costs, some training and enforcement costs are likely to be incurred with expanded facilities, particularly if these are separate from existing roadways.



Police on bicycles.

Educational and Promotional Programs. Educational programs are geared toward improving awareness and competence of walkers, cyclists, and motorists. Educational and promotional programs may include films, videos, pamphlets, posters, and/or specialized training courses.

Costs would be incurred not only with preparation but also with implementation, including distribution of the particular package of materials. The programs could be part of the ongoing school education or incorporated into drivers' education. Other educational programs might include mass mailing of literature or distribution of helmets. Broadcasting films or videos on television might generate additional costs for broadcast time. However, the news media (newspapers, radio, or television) could offer possibilities for free promotion of bicycling and walking.

The costs of educational programs vary significantly depending on what tasks need to be accomplished. In many instances, items and services are donated by private organizations. A responsible bicycle or pedestrian coordinator can conduct public relations with private groups to stimulate their interest in community service.

Other promotional programs people would enjoy are special events such as races, tours, and bike/walk-a-thons. These programs are particularly effective because they allow for family participation.

Other Planning and Institutional Options. Other options to promote walking and cycling include improving planning and institutional and professional responsiveness. These generate "softer" costs. The costs are integrated with other elements and difficult to quantify by specific element. These planning and institutional options can have a substantial impact on walking and bicycling in conjunction with the provision of facilities.⁶⁷

These programs and measures are geared to the community in general. They work in concert with the bicycling and pedestrian facilities to produce the climate and environment that encourage walking and bicycling. For example, transportation strategies, which include incentives to use nonmotorized modes and disincentives to automobile use, address such policy issues as:

- Allowing bicycles on transit.
- Providing employee inducements (bike racks, showers at work, etc.).
- Imposing a fee on auto use in peak hours.
- Increasing fuel prices and/or parking fees.
- Reusing/converting old bridges and railroad rights-of-way.
- Enacting bicycle parking ordinances.
- Instituting employer Traffic Demand Management (TDM) programs.

Many of these policies are part of TDM programs already required in conjunction with programs to reduce air pollution and traffic impacts associated with proposed office developments. With the exception of employee inducements, these policies involve planning or legislative initiatives rather than capital costs.

Disincentives to auto use, such as increases in the price of fuel, are generally motivated by other reasons than to increase nonmotorized

accurate costs need to be developed based on current construction cost information for the various types of facilities.

Several other types of information are also needed on benefits and costs. First is a method to determine the costs of improvements that are incorporated as part of other roadway programs or improvements and bridge replacements. In some cases the provision of wider shoulders, for example, could add only an incremental increase to the cost. This widening could have a major cost impact, though, if it required additional right-of-way, causing displacement of homes or businesses. Second, some costs still need to be identified, including those for pedestrian and bicyclist refuge islands, and special facilities for wheelchair users. Besides the costs for construction and maintenance of facilities, it would be useful to develop a range of costs for educational and promotional programs. This could take advantage of existing video and printed materials that could be tailored to a specific situation.

The data identified above will be obtained from several case studies as well as from continued review of existing sources. Five case studies currently planned will address the following subjects:

- Determine trade-offs among the needs of motor vehicle users, pedestrians, and cyclists.
- Incorporate consideration of bicyclists and pedestrians into the driver licensing process and educational programs.
- Summarize existing bicyclist- and pedestrian-related laws and enforcement programs.
- Quantify benefits of bicycling and walking on health.
- Determine benefits of bicycling and walking on the environment.

**APPROACHES
TO
COLLECTING
THE NEEDED
INFORMATION**

travel. Consequently, it is not germane to compare the cost of such measures (nor their benefits) with the costs and benefits of measures aimed specifically at increasing walking and biking.⁶⁸

Other planning options, institutional measures, and legislative initiatives which generate "costs" are:

- City planning which addresses land use distribution and density to facilitate bicycling and walking.
- Incorporation of planning for bicycling and walking in transportation courses.
- Modification of zoning and building codes to require facilities for bicyclists (such as racks and lockers) and pedestrians (such as sidewalks and benches).

Not only is it difficult to quantify costs for these options, but action is also required at a local or institutional level.

Based on evaluation of the current information, additional data needs were identified with regard to the benefits and costs of providing improvements and measures for increased usage.

ADDITIONAL INFORMATION NEEDED

Benefits

Accident Rates, Incidence, and Severity. Increased bicycling and walking could result in an increase or decrease in accidents and conflicts with vehicles, depending on location and volume. For example, accidents involving motor vehicles could be reduced by segregating modes with a separate bikeway or grade separation. On the other hand, accidents could increase from the growth in the number of bicyclists and walkers, and from increased vehicular conflicts. At present, the data on health hazards to bicyclists and pedestrians sharing a right-of-way with motorized traffic are mixed. Additional information would be helpful to allow for planning and development of a safer transportation system for bicyclists and walkers.

Trip Generation. In some studies, trip generation for cyclists and pedestrians is indicated to be related to trip purpose (work, school, and personal) and trip length. These factors are also critical in determining the number of trips diverted from transit or motor vehicles, and for inducing people to bicycle or walk because of the new facility or measure.

Transit Revenue Changes. New walkers and bicyclists may have previously used either bus or rail transit. Consequently, the shift to bicycling and walking may possibly decrease the use of public transportation systems, which would reduce transit revenues. On the other hand, improved access to transit stations for cyclists and pedestrians may increase ridership. Data on the impact of these improvements on ridership would help in evaluating the cost effectiveness of new facilities and other measures.

Land Use Patterns. Based on previous studies, different community developments and land use patterns in urban and suburban areas have different potential for diverting people to cycling and walking. Additional studies would assess whether land use densities and patterns can be used in conjunction with particular measures or facilities to increase bicycling and walking. This may include an evaluation of average trip lengths between compatible land uses (residential and commercial) and resulting usage. Studies of land use patterns could also be used to determine the relative importance of improvements and land use.

Costs

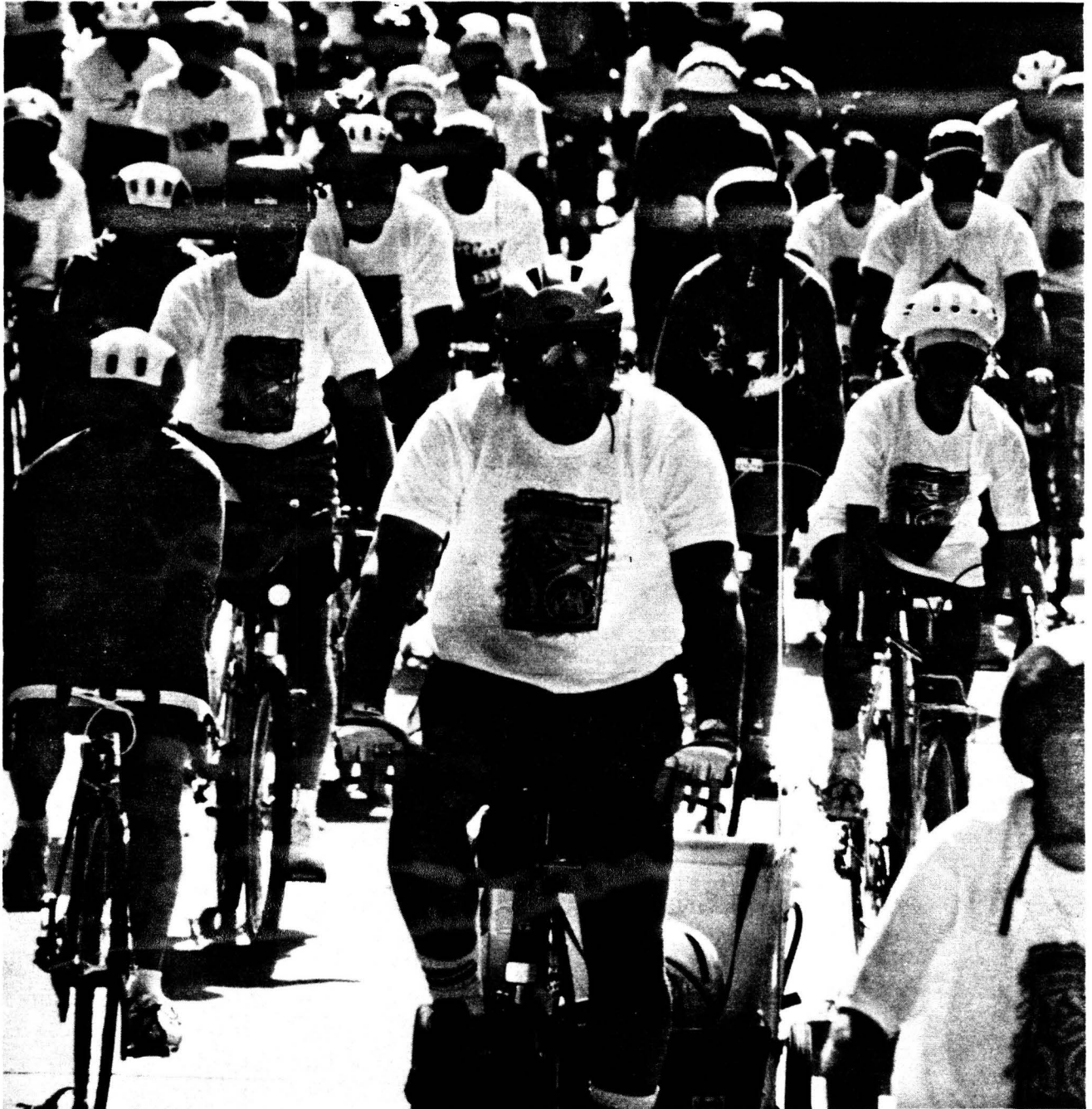
The costs listed in Tables 3 and 4 were generated from other studies which are several years old. The costs were all converted to 1991 figures by using the Consumer Price Index values for inflation. More

Separate pedestrian and bicycle facilities.



CHAPTER 4

SUCCESS OF PROMOTIONAL PROGRAMS



AVAILABLE INFORMATION

Bicycling and walking are being promoted in a variety of ways. The program components presented below result from a review of many kinds of references, ranging from scientific papers to magazines to simple brochures or fliers. Many constructive elements are used to promote bicycling and walking, though little is known about the effectiveness of the specific elements. Various program components that have been used to promote both bicycling and walking are as follows:

- Facilities and environment.
- Health, fitness, and exercise.
- Alternatives to driving.
- Employer incentives.
- Environmental concerns.
- Bicycle and pedestrian coordinators - State and local.
- Statewide plans and programs.
- Local plans and programs.
- Special events.
- National, regional, State, and local conferences.
- Magazines and other publications.
- Advertisements/media.
- Equipment and trade organizations.
- Clubs and organizations.
- Maps.
- Education.

In addition, several promotional components are specifically for bicycling:

- Buying guides.
- Repair guides.
- Information on cycling skills and sharing the road.
- Reference listings.
- Helmet campaigns.
- Information for children.

Some Examples of Excellent Promotion

Bicycling has benefited from many kinds of organizations and activities, some national in scope and some "grass roots" in nature. Because of this, the types of promotional components for this mode are somewhat broader than for walking. The increased interest in walking and pedestrian activities is more recent than for bicycling activities,

resulting in fewer national, State, and "grass roots" organizations. In addition, less has been done in the pedestrian area because of fewer outspoken advocates and less demand by the public. In general, whatever program is beneficial for bicycle promotion tends also to be good for walking promotion.

To introduce the discussion of promotion categories, it is appropriate to present some examples of cities in North America where promotion of bicycling and walking has been the most successful. *Bicycling* magazine ranked the ten best cities for **bicycling** in April 1990. In order, these were: Seattle, Washington; Palo Alto, California; San Diego, California; Boulder, Colorado; Davis, California; Gainesville, Florida; Eugene, Oregon; Montreal, Canada; Madison, Wisconsin; and Missoula, Montana. Some of the important characteristics that are present in these cities include.

- Great places to ride - parks, places with views, good off-street trails and on-street facilities.
- The ability to carry bikes on other transport modes like buses, ferries, trains, and trolleys.
- A visionary cycling community.
- A heritage of progressive city politics.

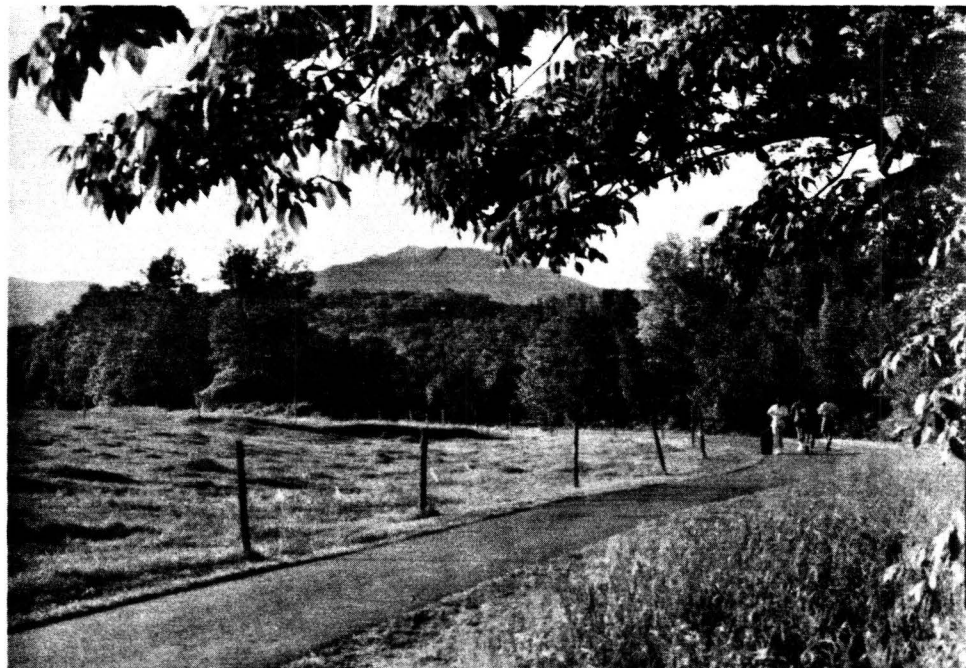


Bicycle/pedestrian path.

- The bicycle as an integral part of the transportation network and not an afterthought.
- Available mapping.
- Popular local bicycle rides.
- Clubs that lobby and provide dollars for the education of bicyclists and motorists.
- Police patrolling on bicycles.
- Citizen participation in government and bicycling decisions.
- Citizens who believe in creating a more livable environment.⁶⁹

Similarly, several characteristics make for a great walking city. *The Walking Magazine* says the key is "an environment that makes it more compelling to stroll the sidewalks than to see it from behind a steering wheel." America's top ten **walking** cities were: San Francisco, California; Savannah, Georgia; Washington, D.C.; Portland, Oregon; Boulder, Colorado; New York, New York; Boston, Massachusetts; Chicago,

**Pedestrian/bicycle trail
through a park.**



Illinois; Philadelphia, Pennsylvania; and New Orleans, Louisiana. Attributes of these cities included:

- Destinations within a 15-20 minute walk.
- A public transportation network of buses, subways, or trolleys.
- Visual variety - stores mixed with residences and businesses.
- Varied architecture - diverse neighborhoods and a lively street life.
- Open spaces and parks.
- Widened sidewalks, auto-restricted zones, benches, signs, and fountains.⁷⁰

Components of Programs for Promoting Bicycling and Walking

Many of the attributes associated with successful bicycling and walking cities appear below in the brief descriptions of specific promotional components.

Facilities and Environment. Although not strictly promotion, the provision of facilities and the presence of a bicycle- and walking-friendly environment are the links that enable bicycling and walking trips to take



A bench along a path provides a place to rest.

place. Formal bike facilities include separate bike paths, marked bicycle lanes, unmarked wide outside curb lanes, and bike routes. However, if frequent cyclists were to describe facilities, their list might include elements such as:

- A road or street that allows people to get where they want to go.
- A road or street with paved shoulders.
- Curb ramps.
- Safe drainage grates that do not snag bike tires.
- Pavements without holes or cracks or other such hazards.

When asked why they do not bicycle for more trips, people often cite the lack of safe facilities (see, for example, the Harris Poll for Bicycling magazine).⁷¹ Frequent cyclists tend to believe that the existing network of streets and roads is likely to remain the primary system of "facilities" for years to come. Furthermore, more cycling (and walking) would occur given certain physical and behavioral modifications between motorists and cyclists to produce a friendlier environment.

Just as with bicycling, the provision of pedestrian facilities is not strictly promotion, but the availability of safe places to walk enables certain trips to be made this way. Once started, walking (like bicycling) may then be used for other kinds of trips.

Given the way some U.S. cities have experienced sprawl, walking is unrealistic as a transportation option in many cases. There seems to be a renewed interest in walking, especially among older adults. Part of this renewal relates to facility improvements or elements that produce a walking-friendly environment. Some of these changes have been modeled on the European experience, particularly traffic calming and the use of pedestrian zones or malls, which are typically combined with a variety of street closings. Often these improvement allow accessibility between the city's business center with shopping centers and historical sites. The pedestrian zones may be designed to preserve old portions of the city, and

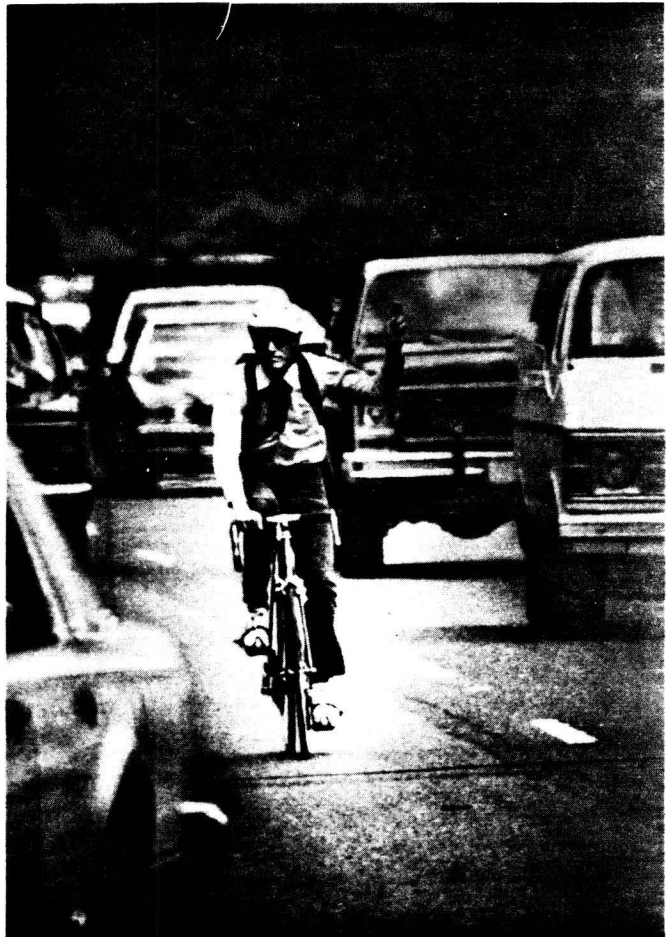
most have some link with transit.⁷² Examples of European and Canadian case study treatments include the following:

- Area-wide traffic constraints in six German cities through street redesign, planting of trees and flower beds, and alterations to the parking and lighting systems and road surface treatments.⁷³
- A pedestrian mall in Munich's Old City linked with public transportation systems and surface and underground rail. One reason the mall was built was that the auto was destroying the charm of the Old City. Once the mall was completed, pedestrian traffic in the area increased 80 percent in the off season. The pedestrian mall was viewed as helpful by reducing traffic volume, improving environmental quality, and combating the self-destructive tendencies of the city.⁷⁴
- The Dutch experience with the design of streets and use of the "woonerf," or an area in which traffic is restricted.⁷⁵
- Using "pedestrianized" streets in Denmark led to a 35 percent increase in pedestrian traffic in the 1960's. This resulted in rapid use of this technique throughout Scandinavia, as well as the use of "woonerf" streets. Pedestrian malls were created to help "push back the cars."⁷⁶
- Through a grass roots movement in 1972, election of Toronto City Council members who re-examined the role of development, which eventually led to an emphasis on altering city streets to enhance their use by pedestrians. The alterations included sidewalk widening, tree planting, use of brick and stone paving, pedestrian-scale street lighting, and other special features such as fountains, gardens, vendor stalls, and public art.⁷⁷
- The changes in pedestrianization in Europe before World War II up to the present, including traffic calming (the slowing of traffic through street redesign, tree plantings, etc.) and protection of residents from wheeled and motor traffic.⁷⁸

In all fairness, it should be noted that not all pedestrian treatments are harmonious with bicycling. Examples include roughened pavement surfaces, especially at crosswalks, and mid-block speed bumps. Problems can also occur when pedestrians and bicyclists share a path or trail.

Certainly the culture in some European nations and the role of bicycling and walking in these cultures are main factors related to the popularity of these nonmotorized transport modes. Nevertheless, the European experience has had an impact in the U.S. There is now much more emphasis on pedestrian malls, safety zones, and a pedestrian environment. As stated earlier, acceptable facilities along with a friendly environment are perhaps the most important way of promoting walking and bicycling. Once people see that walking and bicycling can be done reasonably and safely--either for recreation, fitness, or some other purpose--it becomes easier for them to consider these modes for other utilitarian trips.

Bicycling to work.



Health, fitness, and exercise benefits. Bicycling is recognized as a form of exercise that is safe and provides cardiovascular fitness benefits. Runners and joggers tend to find that cycling is an enjoyable source of aerobic activity that exerts less wear and tear on joints. Some people initially cycle only for the fitness benefit, but then use the bicycle for other trips as they become familiar with cycling in traffic.

Walking is similarly seen as a way to exercise safely and yet still produce health and fitness benefits. Those who walk for health reasons probably account for a large proportion of new walkers. There has been a proliferation of walking-for-exercise aids such as specialized shoes, clothing, and hand weights. Certainly walking (and to some extent bicycling) has a strong link to corporate wellness and health programs.

Alternatives to driving. Bicycling trips have grown in frequency in some areas as a result of employer programs that focus on decreasing the number of single occupant automobile trips. A good example is the Transportation Alternatives Program conducted in Boulder, Colorado, by the National Center for Atmospheric Research and the University Corporation for Atmospheric Research (NCAR and UCAR), which asked employees to use an alternative mode of transportation at least once a week in their commute to NCAR. Program elements to facilitate the mode shift included bicycle racks on shuttles and increased frequency of shuttles, emergency ride contingency plans (for example, when a cyclist might need an emergency motor vehicle trip), "Bike to Work Week"



Employers could provide facilities such as bicycle parking to encourage employees to bike.

competition, improved bicycle security, and improved shower and locker facilities.⁷⁹

These strategies also promote walking. For example, increasing the frequency of shuttles or providing universal bus passes may lead to the use of walking for at least one part of the daily work trip.

The City of Boulder Alternative Transportation Center also promotes non-motorized travel. In this community, an unusually high nine percent of all trips are made by bicycling and 19 percent by walking.⁸⁰ Walking is specifically promoted through bus passes, special events such as "Walk Week," a guaranteed ride home, and other means. The Center also promotes "Boulder Bike Week" and a "Bike to Work Day." The goal is to reduce single-occupant vehicles by 15 percent in the city.

The U.S. Environmental Protection Agency has also developed information about organizing an all-purpose bike day and a bike-to-work seminar.⁸¹ A number of State and local organizations have developed their own materials and program guides.

Employer incentives. Employer incentive examples for biking include "flex time" (to avoid peak traffic and darkness); reimbursement for use of bicycles for official business; subsidized or free, secure bike parking; purchase of company bike fleets; life and automobile insurance premium discounts for regular bike commuters; and provision of shower and locker facilities.⁸² The recent Harris Poll for Bicycling magazine found that 18 percent of adults in the U.S., or 29.7 million people, said they would sometimes commute to work by bicycle if monetary incentives were offered by employers.⁸³

Examples of walking incentives include "flex time," provision of showers, alternative ways to make trips during the work day, and any monetary incentives or subsidies pertaining to walking to work or on work trips. Disincentives for motor vehicle usage should also be mentioned here (for example, charging or charging more for auto parking rather than providing this as a free or inexpensive benefit).

Environmental concerns. In an age where there is much concern about global climate change warming and ozone depletion partially as a result of driving automobiles and burning fuel, providing information on such environmental impacts is certainly a method of promoting bicycling and walking as alternatives to the motor vehicle. The above promotion

programs within agencies performing environmental research (NCAR,UCAR) are examples of "practicing what one preaches."

Bicycle and pedestrian coordinators. For many years, various locations in the U.S. have had State and local bicycle coordinators. The result is generally a potpourri of activities relating to bicycling, some of which will be discussed below. Of note is the fact that two national positions have been created within the U.S. DOT--a bicycle program coordinator within the FHWA and a bicycle-pedestrian coordinator within the Office of the Secretary. Promotion, policy, and programs will be part of the responsibilities of each position.

As interest in walking and pedestrian issues has risen in recent years, so has the number of State and local pedestrian coordinators. Modeled after the bicycle coordinator positions, pedestrian, or "ped" coordinators now are in place in a number of States (for example, Florida and New Jersey) and localities with active pedestrian programs. Because both modes are nonmotorized transport, the coordinator for pedestrians and bicycles is sometimes a single position. Promotion is an active ingredient of the job.

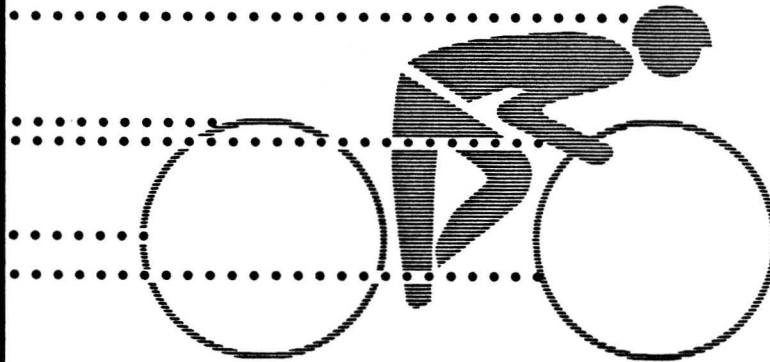
Bicycle and pedestrian coordinators are keys to successful program implementation. Their ability to involve citizens on various committees (such as bicycle and pedestrian advisory committees) is one ingredient of their success.

Statewide plans and programs. As State bicycle coordinators have become more prevalent, the development of Statewide plans and programs has followed. Notable examples of comprehensive plans include the "Florida Bicycle Sketch Plan,"⁸⁴ "Plan B: Letting Bicycling Work for Minnesota,"⁸⁵ and the "State of Oregon Bicycle Master Plan."⁸⁶ Such plans typically contain program goals and spending priorities, facility design guidelines, and considerations for integrating the bicycle into existing policies, procedures, and programs. The plans tend to encourage bicycling as a regular form of transportation.

In regard to walking, Statewide plans and programs typically follow the establishment of the pedestrian coordinator position. Examples from Florida include a pedestrian coordinator's manual for developing pedestrian plans⁸⁷ and the "Florida Pedestrian System Plan."⁸⁸ Other good examples are guidelines for promoting pedestrian access and safety, prepared by the Northwestern Illinois Planning Commission,⁸⁹

Florida DOT Bicycle Sketch Plan.

Bicycle Sketch Plan



Florida Department of Transportation

and a study to determine what actions would influence commuters to walk, bicycle, or take the bus to metro rail stations in Northern Virginia.⁹⁰

Local plans and programs. Similar to the above, cities and communities with bicycle and pedestrian coordinators have benefited from plans and programs. Seattle is a noteworthy example since this city has a comprehensive bicycling policy, an urban trails program, maps of bike facility locations, ongoing spot improvements, and maps with bicycle



Bicycle race.

commuting times to downtown from various locations around the city, among others. Seattle has a pedestrian and bicycle improvements request forms that yield citizen input. In addition to Seattle, the surrounding King County area has also taken positive steps to incorporate bicycling into its transportation system. This has been a total system approach, involving surveys, policy formulation, corridor definition, bike activity estimates, bikeway planning, and implementation.

Baton Rouge, Louisiana, has a "Greenlinks Concept Plan" to promote walking, bicycling, and jogging, and a "Horizon Plan" to promote bicycling. The "Tributary Greenways Program" was developed in Boulder, Colorado, to develop trails for cyclists and pedestrians along creeks within the city. Tucson has a "Major Streets and Routes Plan," which encourages bicycle and pedestrian travel and seeks to coordinate land use plans with transportation plans.⁹¹ Capital improvement projects on major streets and collectors roads are designated with 17-foot outside lanes to provide five-foot striped bike lanes where possible. Tucson also has a standard relating to pedestrian access to public accommodations, transportation systems, and housing.⁹² The Phoenix "Futures Forum Report," a citizen-based initiative, has a thorough list of goals relating to the promotion of bicycling and walking.⁹³ The Borough of Manhattan has a comprehensive plan for dealing with pedestrian issues primarily related to facilities.⁹⁴

And as a final example, the Alternative Transportation Center at Boulder focuses on improvements such as completing missing sidewalk links, providing shelters at transit stops, providing benches, separating pedestrian paths at busy spots from shared bicycle and pedestrian paths, providing grade-separated pedestrian crossings, and arranging for sidewalk repairs.⁹⁵

Special events. Special promotional activities can be used to develop an interest in bicycling, which then translates into wider use. Examples of these bicycle events include general bike days (for example, to promote any kind of riding), bike-to-work days, trail or park rides, bike repair clinics, bike festival days, moonlight rides, bike tours, bike-a-thons, races (including criteriums, road races, and time trials), weekend rallies, bicycle fitness campaigns, adult bicycling courses, rodeos, and events used to identify hazardous locations in a community. Other special bicycling events that involve corporate sponsorship and produce spectator appeal include the Tour du Pont and the Tour de France.

Although not as numerous as bicycling events, promotional pedestrian events include walk-to-work days, walk weeks, trail walks, walks across States, charity-related walks, senior sports classics, consumer expositions, and others. A notable example is the annual convention

Some magazines that pertain to walking and bicycling.



hosted by *Prevention* magazine that typically includes a group walk. Again, the idea is to encourage walk trips that could lead to more frequent use of this mode of travel.

National, regional, State, and local conferences. Conferences are often held to bring together many elements of the bicycling community, from administrators to proactive organization specialists to interested riders. At the national level, the PRO BIKE conferences, largely organized and sponsored by the Bicycle Federation of America, have been held biannually since 1980 and have attracted an international audience. Workshops include topics such as promotion, education, enforcement, laws and ordinances, etc. National Rails-to-Trails conferences (pertaining to the conversion of abandoned railroad corridors to bicycle and walking trails) have taken place in Naperville, Illinois (in 1987, with 275 participants); Dayton, Ohio (in 1989, with 325 participants); and Baltimore, Maryland (in 1991, with 444 participants). Regional, State, and local conferences also spring up where there are bicycle coordinators or an alternative transportation organization.

With regard to walking, the Alternative Transportation Center in Boulder hosted its twelfth annual international Pedestrian Conference in October 1991. Bethesda, Maryland, co-hosted this year's Pedestrian Conference, in conjunction with the Pedestrian Federation of America. Other State and local pedestrian conferences promoting this mode occur in areas where there are pedestrian coordinators. Also worth noting is that the PRO BIKE 90 Conference held in Arlington, Virginia, expanded its theme to include pedestrian issues.

Conferences are important not only for information but also for forging or strengthening a group identity and a political mode of operation. Bicyclists and walkers can thus identify themselves as such. This personal touch can translate into important political ramifications.

Magazines and other publications. Certainly magazines are in the business of promotion. As noted by the Bicycle Institute of America, publications for general reading include *Bicycling*, *Bicycle Guide*, *Bicycle USA* (League of American Wheelmen's membership magazine), and *Bikereport* (Bikecentennial's membership magazine). In addition, "Bicycle Forum" is a periodical for activists, educators, and bicycle program specialists. Trade publications include *American Bicyclist and Motorcyclist*, *Bicycle Business Journal*, and *Bicycle Dealer Showcase*. Also, there are many books that pertain to general interests; health, fitness, and nutrition; mountain bikes; racing; touring; and repair and maintenance.⁹⁶

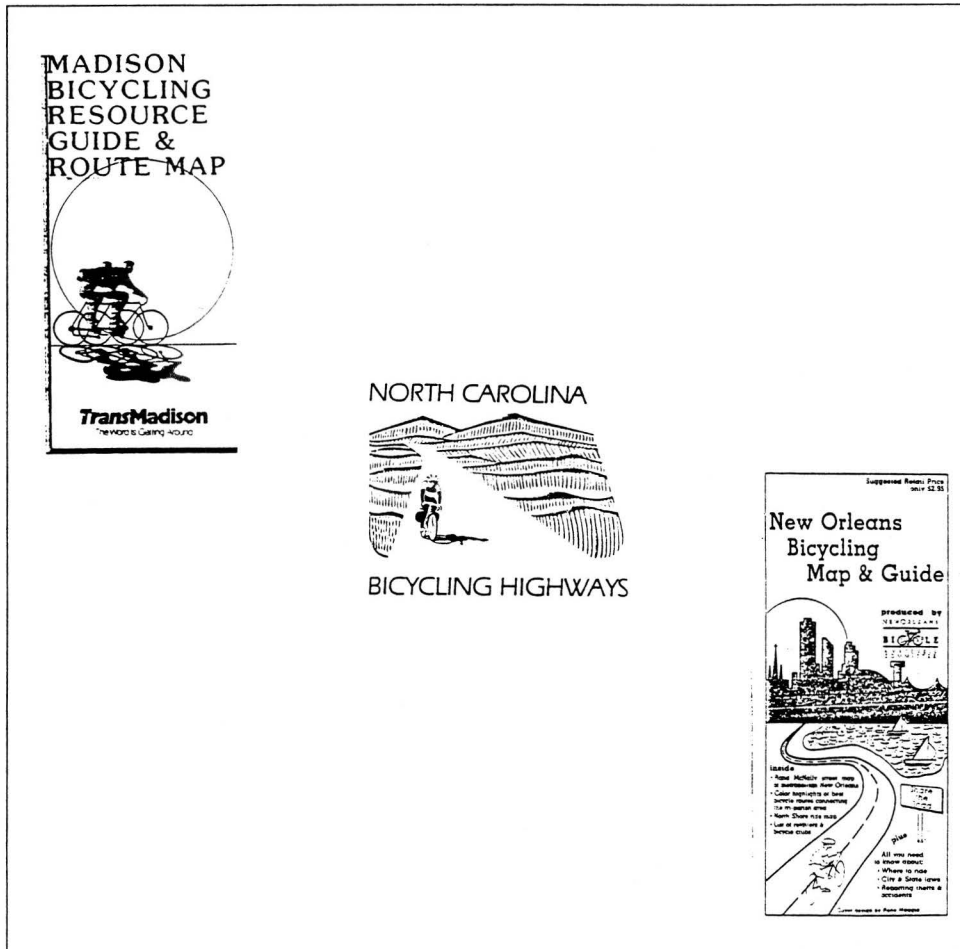
Two currently popular magazines that promote walking are *Prevention* and *The Walking Magazine*.^{97,98} *Prevention* tends to focus on various ways to stay healthy. *The Walking Magazine* concentrates on issues related to its title, including exercise and fitness information, places to walk, special events, races, and clothing.

Advertisements/media. Bicycling tends to be promoted through product advertisements. A variety of advertisers that like to promote their products as "health products" or "health foods" will sometimes use photographs of bicyclists in their ads. Exercise attire (such as the lycra outfits) is frequently marketed using bicyclists as models.

Many of the advertisements pertaining to walking focus on shoes, clothing, and other equipment. *Walk USA* is a catalog of this type. As with bicycling, some food products are also advertised with walkers and runners in mind.

Equipment and trade organizations. Closely related to advertising, there are many kinds of bicycles and related equipment items that are used in a promotional way. Walking "equipment" consists primarily of shoes and clothing. The most notable trade associations include the Bicycle Institute of America, Bicycle Manufacturers Association of America, Bicycle Wholesale Distributors Association, Chicago Area Bicycle Dealers Association, Cycle Parts & Accessories Association, and the National Bicycle Dealers Association. The Rockport Walking Institute is an example of a corporate promotional group.

Clubs and Organizations. General bicycle and pedestrian promotional organizations are abundant and include the Bicycle Federation of America, American Bicycle Association, American Youth Hostels, Bicycle Institute of America, Bikecentennial, Canadian Cycling Association, League of American Wheelmen, United States Cycling Federation, and Women's Cycling Network. There are also many national organizations listed by the Bicycle Institute of America that can be categorized by bicycle motor cross and freestyle bike riding, off-road bicycling and hiking, racing, and recreational riding. Two notable examples are the International Mountain Bike Association and the National Off-Road Bicycling Association. Other promotional organizations that should be mentioned are local bicycle clubs. Two walking-related organizations include the U.S. Walking Association and the Pedestrian Federation of America.



City and State bicycle maps.

Maps. Maps of bike routes are now relatively common and range from urban or community maps to Statewide, regional and even trans-U.S. routes. Some of the local maps simply show the location of designated bicycle facilities. Others show neighborhood or loop rides or routes good for commuting. Suitability maps use variables such as speed limit, roadway width, traffic volume, number of commercial and residential driveways, sight distance, and percentage of trucks to develop a rating for the routes. Sometimes hazardous intersections or railroad grade crossings are also marked.

The North Carolina DOT Bicycle Program has been a leader in this area, with various local, regional, and Statewide maps available. Other States with good mapping include Delaware, Maryland, Massachusetts, Ohio, Oregon, and Wisconsin. Notable examples of regional maps include those of the Finger Lakes Region in New York State; the Oregon Coast Bike Route; and the Claire Saltonstall Bikeway from Boston to Provincetown, Massachusetts. Good examples of community

or urban map examples exist for Durham and Wilmington, North Carolina; Seattle, Washington; Missoula, Montana; Eugene, Oregon; Providence, Rhode Island; and Baltimore, Maryland. Also, Edmonton, Alberta has a useful designated facilities map.

Education. The various bicycle education programs encompass materials for elementary school children (such as the Basics of Bicycling and the Complete Bicycling Education Program), programs for adults (such as, Effective Cycling), and others (such as guides for bicycle rodeos). There are also numerous other educational services, including those at rallies and special events, clinics at the work place, and programs offered through adult and continuing education.

Various pedestrian education packages or programs are available, including the "Walk Alert" program (jointly prepared by the FHWA, the National Highway Traffic Safety Administration, and the National Safety Council), the National Highway Traffic Safety Administration's "Pedestrian Accident Reduction Guide," and educational films or videos for school-age children such as "Willie Whistle" and "And Keep on Looking." These last two films/videos have been formally evaluated and determined to be effective in reducing pedestrian accidents involving children.

Other bicycle promotion strategies. Besides the long list of promotion possibilities mentioned above, other areas that warrant investigation because of the role they play in bicycle promotion include:

- Buying guides that illustrate the many kinds of bicycles and related equipment available to consumers.
- Repair guides that illustrate that many bicycle repairs can be done easily.
- Information on cycling skills and sharing the road.
- Reference listings (for example, Bicycle Institute of America's "Bicycling Reference Book").
- Helmet campaigns (such as the National Safe Kids campaign).
- Information prepared for children (such as coloring books).

To summarize, bicycling and walking can be promoted in many ways. A coordinated approach involving various elements would most likely yield the best results. Also needed would be a favorable political climate and strong public policy.

The preceding discussion outlined numerous ways of promoting bicycling and walking. Much more needs to be known about **how well these various programs work in creating bicycling and walking trips. What are the benefits and costs** associated with the different types of promotional efforts? Which efforts are of the **immediate type** and which provide more **long-term benefits**? Some evidence of the effects of promotion could be noted in the trend of bicycle sales over the years, as well as bicycling and walking trip information generated by surveys such as the periodic National Personal Transportation Survey.

ADDITIONAL INFORMATION NEEDED

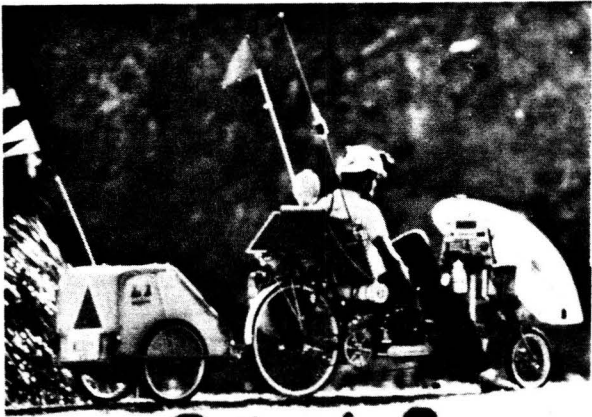
Five case studies are being conducted to address the research needs identified above. Some effort should be made to estimate the effectiveness of these worldwide promotion schemes, followed by an attempt at synthesizing and prioritizing the information:

- Review bicycle and pedestrian programs in European countries.
- Study bicycle and pedestrian programs in Asian countries and in Australia and New Zealand.
- Analyze successful provincial, State and local programs in North America.
- Investigate traffic calming, auto-restricted zones, and other traffic management techniques and their effects on bicyclists and pedestrians.
- Determine ways to better integrate bicycle and pedestrian considerations into State and local transportation planning, design, and operations.

APPROACHES TO COLLECTING THE NEEDED INFORMATION

CHAPTER 5

OUTLOOK AND NEXT STEPS



U.S. Department of Transportation
Federal Highway Administration



The time is right for promoting bicycling and walking. Americans are concerned about the environment and interested in health, fitness, and exercise. Increasing the amount of bicycling and walking will take time, but can occur by developing and implementing policies, plans, and measures which respond to the potential for bicycling and walking expressed by people in recent surveys.

Bicycling has been growing in the last two decades. Sales of bicycles is high, and more adults cycle today in the United States than in the past. Various organizations are working to promote bicycling as an attractive means of transportation. Similar forces are emerging to advance walking. A key element will be to identify and build on the successes of these local, State, and national organizations.

Bicycling and walking can be increased through multi-dimensional promotion programs. Much hinges on a favorable local community climate including political support, and a great deal can be learned from the communities considered best for bicycling and walking. In these locations, many successful promotional measures and programs are in place. However, other characteristics of these cities include broader qualities that encourage bicycling and walking. They have appealing places to bicycle or walk, have institutionalized bicycling and walking in the transportation planning process, have active community groups promoting bicycling and walking, and have support from community leaders and officials.

Much remains to be accomplished to meet the goals of the National Bicycling and Walking Study. Additional studies are underway to fill voids in existing information. More recent usage data will be examined, and contacts will continue to be made with individuals and community officials to provide on-going input to the study.

The U.S. DOT can play a leadership role in promoting safe bicycling and walking throughout the U.S. This role and the measures which should be instituted will be developed as the result of this Study. They will be based on assessments of the information developed to date together with that being developed as a part of the on-going studies. The end product will be a framework for State and local plans to promote bicycling and walking and an action plan for implementing the Federal transportation policy.

APPENDIX

Response to Federal Register Notice

A notice was placed in the February 5, 1991, issue of the Federal Register requesting comments concerning the five main objectives of the National Cycling and Walking Study. As of July 16, 1991, the Federal Highway Administration had received 421 responses from U.S. residents, and two foreign responses (one from the U.K., and one from the Netherlands). The respondents included 396 private citizens, 25 of whom are members of the *Prevention* Walking Club, and 249 respondents wrote as a result of the editorial in *Prevention* magazine. Nineteen of the comments came from public officials of various State and local agencies. The other six were from private groups. More comments are expected. The following summarizes the main views expressed by the respondents, categorized by each of the five main study objectives.

1. Determine current levels of bicycling and walking, and identify why they are not better used as a means of transportation.

A. People fear to walk or bike because of the dangerous attitude of motorists towards bicyclists and pedestrians. Many problems occur on narrow roads with small or no shoulders, busy streets, and intersections. A total of 46 people wrote about their incidents with motorists. Pedestrian right-of-way at all intersections were requested by 119 people. They believe that motorists should yield to pedestrians and bicyclists at all times, especially when they turn right.

B. Facilities are not cleared when it snows. This results in greater danger for walkers and bikers who use the streets.

C. There are problems with sharing paths for different purposes such as running, walking, and bicycling. Many bikers wrote saying they would rather share the roads with motor vehicles than with pedestrians, roller skaters, dogs, etc. Furthermore, if bicycles are to be taken as a serious form of transportation instead of just recreation, then the biker is also concerned about traveling in the shortest amount of time on the roads.

D. People currently need to DRIVE to most of these bicycle and walking facilities.

E. Bicycles can be easily stolen. There is a lack of lockers and bicycle racks to store bicycles and personal belongings, and no shower facilities at many places of employment.

F. Facilities should not be built only as the result of heavy pedestrian and bicycle use. Instead, facilities built between desired origins and destinations will generate pedestrian and bicycle use if properly planned.

G. Americans are too accustomed to the automobile as their only means of transportation. The low cost of fuel and the poor public transportation system are reasons why people use the automobile. The problem is how to create a bicycling population out of a motorized society (nine responses).

H. Zoning should be re-evaluated to allow employment centers closer to residential communities. There are very few places where people can live, work, and shop in a concentrated area. We have built our communities as if work, play, school, home, etc., are separate and inaccessible to each other. This fosters a dependence on the automobile (six responses).

I. Planners often think that people bike or walk for recreational purposes only. Bicycling and walking are not taken as serious forms of transportation.

2. Develop a plan for the increased use and enhanced safety of these modes and identify the resources necessary to implement and achieve this plan.

A. It would be easier for sidewalks to be designed initially with all construction plans. Sidewalks should be mandatory for all schools.

B. The bicycle and pedestrian facilities should be built along highways, bridges, and railroad tracks.

C. The facilities should be integrated with the public transportation services. This may include having bicycle storage at transit stations or bike racks on the buses, trains, or ferries (seven responses).

D. The government should help fund bicycle renting operations at locations most conducive to high utilization, such as central business districts.

E. Motorists, bicyclists, and pedestrians need to be educated to use these systems together courteously (30 responses).

F. Pedestrians should have the right-of-way at all intersections. There should be designated pedestrian walkways at all shopping center and mall parking lots (19 responses).

G. These programs should be promoted at all levels of the government. The real issue is the social/psychological frontier of getting people to realize that this is primarily a quality of life issue with many economic and ecological ramifications.

H. Employers should promote this program, by designating walking days, and having flexible working hours, so that employees can choose the best time for them to commute by bicycling (seven responses).

I. Paths should be designed to consider the various types of people who use the facilities, such as the elderly, handicapped, and children.

K. Gas taxes should be increased to discourage people from using their automobiles.

3. Determine the full costs and benefits of promoting bicycling and walking in urban and suburban areas.

A. Bicycles offer an inexpensive and non-polluting alternative to the automobile. Bicycling will become increasingly important in the future.

B. So much can be learned by taking a walk around your community.

C. The true costs of cardiopulmonary diseases resulting from air pollution, elevated motorist stress levels, and the epidemiological effects of sedentary people resulting from excessive reliance on motorized transportation are typically overlooked and underquantified.

4. Review and evaluate the success of promotion programs around the world to determine their applicability to the role of the U.S. Department of Transportation to implement a successful program.

A. Many European countries provide racks for bikes on buses.

B. Denmark is a country that understands bicycling, and they have a very good and safe automobile/bicycle system. It recognizes the bicycle as an alternative means of transportation, and most people have a bike and use it daily. For the Danes, the bicycle is not a toy. Bicycling is a part of Dutch national character.

C. There are many bicycle commuting success stories, like Eugene, Oregon, where over eight percent of adult workers cycle to work. In these communities, the basic needs of bicyclists have been met, and bicycling is an enjoyable activity.

D. It is the law in California for cars to stop when a walker enters the intersection.

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