Chapter 1

Introduction to Bicycle Facilities

1. Goals and Visions for Bicycle Use

The Intermodal Surface Transportation Efficiency Act (ISTEA) set a new direction for surface transportation in America that is enunciated in its statement of policy:

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

Provisions for bicycling, with its potential for providing economically efficient transportation, became an important policy goal of ISTEA. The Secretary of Transportation was directed to conduct a national study that developed a plan for the increased use and enhanced safety of bicycling and walking. The National Bicycling and Walking Study - Transportation Choices for a Changing America presents a plan of action for activities at the Federal, State and local levels for meeting the following goals:

- To double the current percentage (from 7.9 percent to 15.8 percent) of total trips made by bicycling and walking; and
- To simultaneously reduce by 10 percent the number of bicyclists and pedestrians killed or injured in traffic crashes.

The potential for increasing the number of bicycle trips is evident in the National Personal Transportation Survey, which shows that more than a quarter of all trips are 1.6 kilometers (one mile) or less, and 40 percent are 3.2 kilometers (two miles) or less. Almost half are 4.8 kilometers (three miles) or less and two-thirds are 8.0 kilometers (five miles) or less. Approximately 53 percent of all people live less than 3.2 kilometers (two miles) from the nearest public transportation route.

New Jersey residents have become aware of the energy, efficiency, health and economic benefits of bicycling for transportation and recreational purposes. In 1995, New Jersey Department of Transportation completed a statewide plan that established policies, goals and programmatic steps to promote safe and efficient bicycling for transportation and recreation in New Jersey. Through an extensive outreach effort, residents established a statewide vision for the future of bicycling and walking for all communities in New Jersey:

> ***"New Jersey is a place where people choose to bicycle and walk. Residents and visitors are able to conveniently walk and bicycle with confidence and a sense of security in every community. Both activities are a routine part of transportation and recreation systems."***

In order to achieve this vision for New Jersey, and to enable people in every community of the state to bicycle with confidence and a sense of security, it is necessary to plan and provide appropriate facilities that will accommodate, encourage and promote bicycling. This manual provides direction regarding how appropriate facilities for bicycling should be provided.

Since these guidelines are a companion document to NJDOT's Pedestrian Compatible Planning and Design Guidelines, it is appropriate to discuss the relationship between pedestrian and bicycle domains in general terms. While both functions need to be carefully planned for, the movement characteristics and needs of pedestrians and bicycles differ in obvious ways. The greater speed and size of the bicycle and rider means that, in general, bicycles are best accommodated as part of the roadway and not on sidewalks. Additional outside lane dimensions or widened shoulders perform this function most typically. For recreational pathways and other unique circumstances (e.g., certain bridges), pedestrian and bicycle movement is sometimes combined if adequate width can be provided and usage is not intense.

2. Types of Bicyclists

Bicyclists in New Jersey form a highly diverse population with varying needs and interests. These bicyclists range from advanced, highly experienced riders who ride frequently, often have special training, are confident in all traffic conditions and can negotiate with less operating space, to basic riders who are more casual in their riding practices and less comfortable riding in traffic, to young children who have not developed adequate judgement or received special training, enabling them to ride in the street unless under the strict control of a parent or other mature person.

Although advanced bicyclists represent only 20 percent of all bicyclists, they account for an estimated 80 percent of all bicycle trips. They are comfortable travelling long distances, are accustomed to using their bicycle (or bicycles) in a variety of environments, and will be the most likely to choose to bicycle for utilitarian purposes such as commuting or shopping.

Basic bicyclists are more casual riders, are less comfortable in traffic and have limited experience and skills. They form the largest group of bicyclists, but since they only occasionally cycle, basic bicyclists account for a smaller percentage of total bicycle trips. However, many casual riders may progress into becoming more confident and active riders as they gain experience.

Basic bicyclists will be more comfortable riding on lightly travelled neighborhood streets, on park or campus roads not used extensively by cars, on roadway shoulders along lightly travelled rural highways or on separate bicycle paths. Basic cyclists travel at slower speeds and for shorter distances compared to advanced cyclists, and frequently will wish to travel with other family members or friends. According to a Harris Poll reported in the National Bicycling and Walking Study, nearly half of all adults in the nation have bicycled at least once during the past year. Because of the urban character of New Jersey, it is reasonable to assume that an even higher percentage of adults would have bicycled at least once in the past year in New Jersey.

Young children form a separate group of bicycle riders. Children have minimal riding skills, little experience and limited physical capabilities. Their bicycles often may be of limited quality, limiting bicycling range. Children unfortunately also often have an inappropriately high level of confidence, or at least fearlessness, in their riding skill, and lack judgement regarding safe bicycling practices. Sidewalks in residential neighborhoods, school grounds and parks provide safe environments for young children to gain the bicycling skills they will need as they grow older. Because of their limited judgement capacity, children under the age of nine should not be allowed to ride on public streets unless actively supervised by a parent or other mature adult.

3. Types of Bicycle Facilities

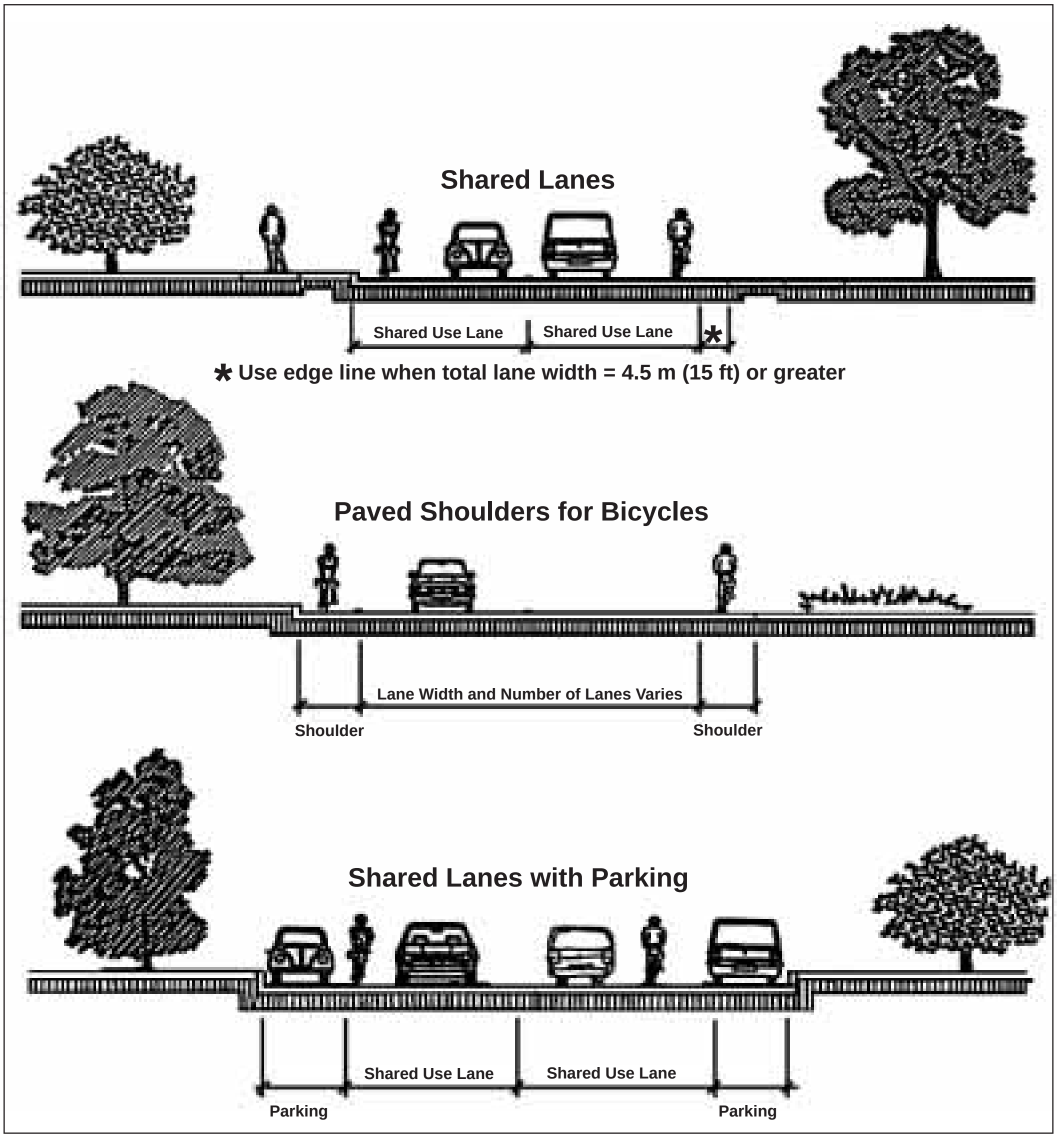
Because of the great difference in skill levels among bicycle riders, different types of bicycle facilities are needed to serve riders in New Jersey. Advanced bicyclists are best served by bicycle compatible streets and highways which have been designed to accommodate shared use by bicycles and motor vehicles. Basic bicycle riders will be especially interested in riding on bikeways which are designated facilities that encourage bicycle use.

The difference between a compatible roadway and a designated roadway can be summarized as follows:

Compatible Roadways: Roads which have design features which allow a competent bicyclist to safely share the roadway with motor vehicles. Compatible roadway design guidelines differ based on traffic volumes, speeds and environmental setting. Because advanced bicyclists can be anticipated to use most of the roadways in the state, it is important that all roadways be designed to be compatible with bicycle use. See Figure 1.

Figure 1

Types of Bicycle Compatible Roadways



Source: Greenways Incorporated

Designated Roadway: Roads on which bicycle use is anticipated and invited through the use of lane markings, signage, maps or tour guides.

Designated bicycle facilities provide greater safety for less experienced or less confident riders. Designated roadways are located where encouragement of bicycle use is desired, based on consideration of traffic conditions, pavement width and geometrics, and appropriateness and directness of the particular route. They are also often located in areas which offer especially pleasing rides such as in parks or through quiet subdivisions. Because basic riders will be more apt to be riding for pleasure, bikeways are often located in resort areas or in regional parks.

As indicated by these definitions, the designation of a roadway as a bikeway represents a proactive policy designed to encourage bicycling. Three categories of bikeways exist:

Bicycle Routes Roadways designated for bicycle use through the installation of directional and informational signage.

Bicycle Lanes A lane designated for exclusive or preferential use by bicycles through the application of pavement striping or markings and signage.

Bicycle Paths A bicycle facility separated from motorized vehicular traffic. A bicycle path may be located within a highway right-of-way or on an independent right-of-way. A bicycle path is not a sidewalk but may be designed to permit shared use with pedestrians.

Figure 2 illustrates the difference between a bicycle route and a bicycle lane.

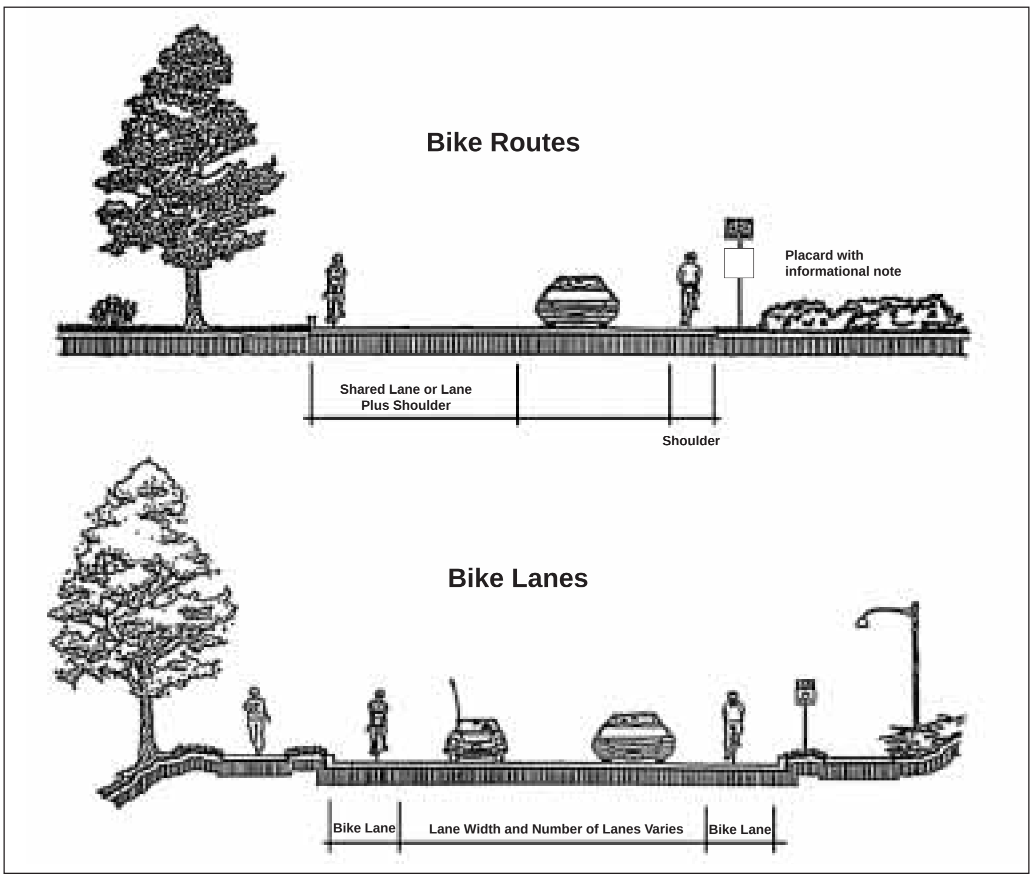
Chapter Two of this manual provides design guidance regarding how streets and highways should be designed to be made compatible with bicycle use. Chapter Three provides planning and design guidance regarding the designation of roadways as bikeways. Chapter Four provides similar guidance regarding the planning and design of bicycle paths.

Chapter Five describes other types of facilities which are needed to make bicycling a viable travel mode for a larger portion of New Jersey's residents. Issues addressed in Chapter Five include bicycle parking and storage, integrating bicycle use with public transportation, and ancillary facilities to aid bicyclists such as shelters, rest areas and comfort stations.

Chapter Six discusses roadway operations and maintenance activities required to support bicycling.

Figure 2

Types of Bikeways on Highways



Source: Greenways Incorporated