



# Bicycle Planning and Safety

An Online Continuing Education Course for Engineers

**Course Number: T-3029**

**Credit: 3 Hours / 3 PDH / 3 CPD**

# Bicycle Planning and Safety

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## I. Introduction

The purpose of this course is to provide guidelines for planning of safe on-road and shared use bicycle facilities. It will provide planners and designers the information to develop the safest most efficient facilities possible.

### A. Roadway Design Standards

The Department incorporates the needs of bicyclists into all appropriate construction and RRR (resurfacing, restoration and rehabilitation) projects. In some instances, right-of-way constraints and safety considerations may limit the extent facilities and treatments can be applied in each section. Considering these limitations, projects are to incorporate the needs of bicyclists to the maximum extent possible.

### B. Roadways Promoting Predictable Behavior

This course provides information to help planners accommodate bicycle traffic in all riding environments and encourage predictable bicyclist behavior. Bicyclists can be expected to ride on all roadways except limited access highways. A lack of safe, convenient and appropriate facilities often leads to bicyclists riding in unsafe locations, such as on commercial district sidewalks. Sometimes they ride against traffic.



### **C. Background**

There is a growing need for designers, citizens and others to have a common vocabulary, common concepts and common knowledge of successful bicyclist systems and facilities in different places. Bicycling facilities planning is still not offered in most college and university curricula. This omission results in a wide variance in planning and design concepts, facilities placement and final design by individual designers.

We have become such a nation of specialists. Many planners lack the opportunity to see a project from concept to concrete. This lack of continuity is complicated by the tendency of planners to be assigned a vast territory, which means they rarely live in the neighborhood or even in the city they are helping to design. A consultant in Atlanta, Georgia may be completing a plan for a project in Ft. Myers, Florida. This course allows all of us to have a common general knowledge of how bicycling facilities work. In this way, specific projects are more likely to do what they are intended to do – serve the public with well conceived, well located, affordable, safe, secure and friendly environments.

#### **1. The History of Bicycling**

Increasingly, transportation officials throughout the United State recognize bicycles provide a viable mode of transportation. Since the early 1970's, bicycling for commuting, for recreation and for other travel purposes has increased in popularity.

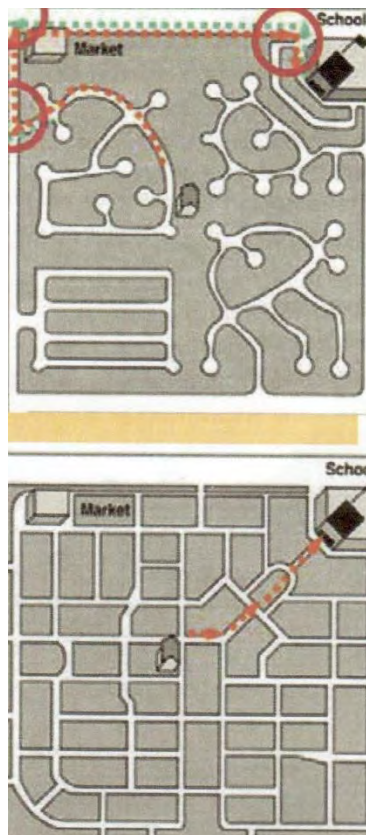
Nationwide, people are increasingly recognizing the energy efficiency, economy, health benefits, pollution-free aspects and the many other advantages of bicycling.

Recent legislation such as the federal transportation legislation, the Clean Air Act Amendments and other initiatives now require governments to consider all modes of transportation. Special emphasis is put on clean, energy-efficient, socially responsible modes, such as bicycling.

## 2. Improving the Intermodal System

Bicycling can help us create a better, transportation system as follows:

- Achieving intermodal links with transit.
- Creating safe and effective links between neighborhoods, i.e. link neighborhoods to destinations where people go for their daily needs.



The illustration on the top shows the typical development isolating the school and market from the communities surrounding it. There are no direct connections to the neighborhood. This type of development decreases the amount of pedestrian and bicycle trips, thus increasing the number of auto trips resulting in higher peak hour traffic and more unsafe conditions.

The illustration on the bottom shows a development providing a well-located school and market laced with greenways for the encouragement of pedestrian and bicycle travel. This was accomplished using a comprehensive plan.

- Reducing complex and costly parking problems.
- Allowing employers to offer choices in mode of transportation for their employees.
- Incorporating greenways development, urban redevelopment and resource preservation.
- Railbank with rails-to-trails conversions.
- Achieving other timely, sensible and sensitive urban and rural land use practices.

Bicycling is for people of all ages. Along with walking, bicycling is more affordable than auto transport, and most people are physically capable of bicycling. Bicycling is more efficient than walking. It is the most efficient means of assuring independent travel for children, elder adults, many people with disabilities and those with limited incomes. Bicycling gives all people mobility at an affordable cost. Bicycling helps keep them fit and improves health. However, bicycling does not replace the car or transit options for longer trips.

Local, state and federal agencies are responding to the increased use of bicycles by implementing a wide variety of bicycle-related projects and programs. The emphasis now being placed on bicycle transportation requires an understanding of bicycles, bicyclists, and bicycle facilities. With adequate planning and facilities development, the bicycle can play an important role in the overall transportation system. Bicycling promotes important land use and conservation policies, which call for compact and integrated land use patterns. These patterns provide reduced parking needs, urban infill, keeping destinations within bicycling distances, mixed use development and more balanced and efficient land use for transport systems.

## D. Comprehensive Program

Facilities are only one of the several elements essential to a community's overall bicycle program. A comprehensive community approach to bicycle use also includes bicycle safety education and training, bicycle use encouragement, and the application and enforcement of the Rules of the Road as they pertain to interactions between bicyclists, motorists and pedestrians.



The illustration on the left shows an older roadway built solely for auto transport. The illustration on the right shows a more modern highway built as a shared use facility. The additional width of the bike lane increases the comfort and safety of all roadway users.

## E. Definitions

**Bicycle** – A vehicle having two tandem wheels, either of which is more than 16 inch in diameter, propelled solely by human power, upon which any person may ride.

**Bicycle Boulevard** – System of roadways and connections between neighborhoods or areas in a community that form a bicycling throughway, but discourages through and higher speed motor vehicle movement.

**Bicycle Facilities** – A general term denoting improvements and provisions made by public agencies to accommodate or encourage bicycling including bicycle paths, bike lanes parking and storage capabilities, lockers and showers, maps of bikeways, marked routes and shared roadways not specifically designated for bicycle use.

**(Bicycle) Bike Lane** – A portion of a roadway that has been designated by signing and pavement marking for the preferential or exclusive use by bicyclists.

Bike route – A system of roads and ways that are linked by signs to aid bicyclists.

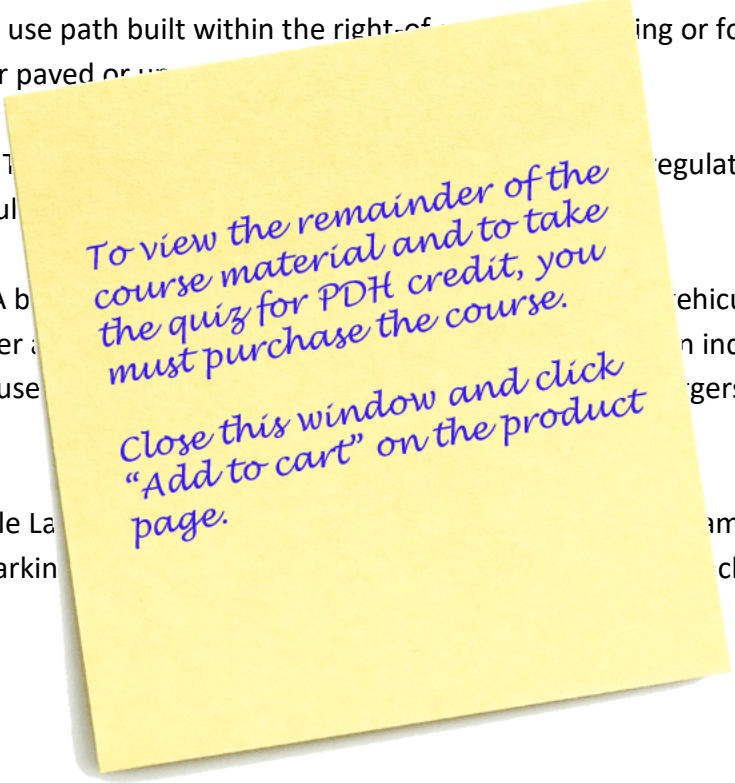
Bikeway – Any road, path, or way that in some manner is specifically designated as open to bicycle travel, regardless of whether such facility is designated for the exclusive use of bicycle or is to be shared with other transportation modes.

Rail Trail – A shared use path built within the right-of-way of an existing or former railroad. These may be either paved or unpaved.

Rules of the Road – Traffic regulations governing the operations of vehicles.

Shared Use Path – A bicycle path, open space or barrier separated from vehicular traffic by an independent alignment. Shared use paths are designed for bicyclists, joggers as well as

Undesignated Bicycle Lane – A diamond, bike and arrow pavement marking at intersections.



## II. Planning

### A. Bicycle Planning

Bicycle transportation planning is commonly construed as an effort undertaken to develop complete/comprehensive bicycle facilities for transportation and recreational activities. The resulting system is composed of shared use paths, improved roadways, bicycle lanes, bicycle parking, bicycle mapping and transit links. All facilities are interconnected and spaced closely enough to satisfy the travel needs of bicyclists. Bicycle planning should be pro-active and comprehensive.

#### 1. Bicycles Using the Existing Systems

Bicyclists have the same mobility needs as every other user of the transportation system. They use the highway system as their primary access to goods, services and recreational activities. Existing highways and streets, often with relatively inexpensive improvements, must serve as the base system to provide for the travel needs of bicyclists. Shared use paths and path connectors can augment this existing system in scenic corridors, greenways or places where access is limited. Water and land transit