

Guide for the Development of Bicycle Facilities

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Introduction

1.1 DESIGN IMPERATIVE

Bicycle travel has played a historic role in transportation. Even before the invention of the automobile, the League of American Wheelmen promoted improved traveled ways.

Bicycling is recognized by transportation officials throughout the United States as an important transportation mode. A policy statement, released in early 2010 by the U.S. Department of Transportation, emphasizes the needs and requirements to integrate bicycling (and walking) into transportation systems (4). Over a quarter of the population in the United States, over the age of 16 rides bicycles (3). Nationwide, people are recognizing the convenience, energy efficiency, cost effectiveness, health benefits, economic development, and environmental advantages of bicycling.

Local, state, and federal agencies are responding to the increased use of bicycles by implementing a wide variety of bicycle-related projects and programs. This interest in bicycle transportation calls for an understanding of bicycles, bicyclists, and bicycle facilities. This guide addresses these issues and clarifies the elements needed to make bicycling a more safe, comfortable, and convenient mode of transportation.

All roads, streets, and highways, except those where bicyclists are legally prohibited, should be designed and constructed under the assumption that they will be used by bicyclists. Therefore, bicyclists' needs should be addressed in all phases of transportation planning, design, construction, maintenance, and operations (1). All modes of transportation, including bicycles, should be jointly integrated into plans and projects at an early stage so that they function together effectively.

1.2 PURPOSE

Bicyclists should be expected on roadways, except where prohibited, and on shared use paths. Safe, convenient, well-designed, well-maintained facilities, with low-crash frequencies and severities, are important to accommodate and encourage bicycling.

Photo courtesy of Alaska DOT.

This guide provides information on how to accommodate bicycle travel and operations in most riding environments. It is intended to present sound guidelines that result in facilities that meet the needs of bicyclists and other highway users. Sufficient flexibility is permitted to encourage designs that are sensitive to local context and incorporate the needs of bicyclists, pedestrians, and motorists. However, in some sections of this guide, suggested minimum dimensions are provided. These are recommended only where further deviation from desirable values could increase crash frequency or severity.

This guide has been updated from the previous guide published in 1999. The fact that new guidance is presented herein does not imply that existing bicycle facilities are inadequate or unsafe, nor does it mandate the initiation of improvement projects. The intent of this document is to provide guidance to designers and planners by referencing a recommended range of design values and describing alternative design approaches. Good design practice involves engineering cost-effective solutions that balance safety and mobility for all transportation modes, along with preservation of scenic, aesthetic, historic, cultural, and environmental resources. This guide is therefore not intended to be a detailed design or traffic engineering manual that could supersede the need for application of sound principles by the knowledgeable design or traffic engineering professional.

1.3 SCOPE

This guide provides information on the physical infrastructure needed to support bicycling. Facilities are only one of several elements essential to a community's overall bicycle program. Bicycle safety education and training, encouraging bicycle use, and enforcing the rules of the road as they pertain to bicyclists and motorists should be combined with engineering measures to form a comprehensive approach to bicycle use. Information on other elements of an overall bicycle program can be obtained from state or local bicycle coordinators and other publications.

The provisions for bicycle travel are consistent with, and similar to, normal highway engineering practices. Signs, signals, and pavement markings for bicycle facilities are presented in the *Manual on Uniform Traffic Control Devices* (MUTCD) (2), which should be used in conjunction with this guide. If there is a discrepancy between the content of this guide and the current edition of the MUTCD, then the MUTCD supersedes this guide for that case. For construction of bicycle facilities, applicable state and local construction specifications should be used.

1.4 DEFINITIONS

Bicycle—A pedal-powered vehicle upon which the human operator sits. The term “bicycle” for this publication includes three- and four-wheeled human-powered vehicles, but not tricycles for children. In some states, a bicycle is considered a vehicle, while in other states it is not.

Bicycle Boulevard—A street segment, or series of contiguous street segments, that has been modified to accommodate through bicycle traffic and minimize through motor traffic.

Bicycles Facilities—A general term denoting improvements and provisions to accommodate or encourage bicycling, including parking and storage facilities, and shared roadways not specifically defined for bicycle use.

Bicycle Lane or Bike Lane—A portion of roadway that has been designated for preferential or exclusive use by bicyclists by pavement markings and, if used, signs. It is intended for one-way travel, usually in the same direction as the adjacent traffic lane, unless designed as a contra-flow lane.

Bicycle Level of Service (BLOS)—A model used to estimate bicyclists' average perception of the quality of service of a section of roadway between two intersections.

Bicycle Locker or Bike Locker—A secure, lockable container used for individual bicycle storage.

Bicycle Network—A system of bikeways designated by the jurisdiction having authority. This system may include bike lanes, bicycle routes, shared use paths, and other identifiable bicycle facilities.

Bicycle Rack or Bike Rack—A stationary fixture to which a bicycle can be securely attached.

Bicycle Route or Bike Route—A roadway or bikeway designated by the jurisdiction having authority, either with a unique route designation or with Bike Route signs, along which bicycle guide signs may provide directional and distance information. Signs that provide directional, distance, and destination information for bicyclists do not necessarily establish a bicycle route.

Bicycle Wheel Channel—A channel installed along the side of a stairway to facilitate walking a bicycle up or down the stairs.

Bikeway—A generic term for any road, street, path, or way which in some manner is specifically designated for bicycle travel, regardless of whether such facilities are designated for the exclusive use of bicycles or are to be shared with other transportation modes.

Highway—A general term denoting a public way for purposes of vehicular travel, including the entire area within the right-of-way.

Independent Right-of-Way—A general term denoting right-of-way outside the boundaries of a conventional highway.

Rail-Trail—A shared use path, either paved or unpaved, built within the right-of-way of a former railroad.

Rail-with-Trail—A shared use path, either paved or unpaved, built within the right-of-way of an active railroad.

Right-of-Way—A general term denoting land, property or interest therein, usually in a strip, acquired for or devoted to transportation purposes.

Right of Way (Assignment)—The right of one driver or pedestrian to proceed in a lawful manner in preference to another driver or pedestrian.

Roadway—The portion of the highway, including shoulders, intended for vehicular use.

Recumbent Bicycle—A bicycle with pedals at roughly the same level as the seat where the operator is seated in a reclined position with their back supported.

Roundabout—A type of circular intersection that provides yield control to all entering vehicles and features channelized approaches and geometry to encourage reduced travel speeds through the circular roadway.

Rumble Strips—A textured or grooved pavement treatment designed to create noise and vibration to alert motorists of a need to change their path or speed. Longitudinal rumble strips are sometimes used on or along shoulders or center lines of highways to alert motorists who stray from the appropriate traveled way. Transverse rumble strips are placed on the roadway surface in the travel lane, perpendicular to the direction of travel.

Shared Lane—A lane of a traveled way that is open to both bicycle and motor vehicle travel.

Shared-Lane Marking—A pavement marking symbol that indicates an appropriate bicycle positioning in a shared lane.

Shared Roadway—A roadway that is open to both bicycle and motor vehicle travel.

Shared Use Path—A bikeway physically separated from motor vehicle traffic by an open space or barrier and either within the highway right-of-way or within an independent right-of-way. Shared use paths may also be used by pedestrians, skaters, wheelchair users, joggers, and other non-motorized users. Most shared use paths are designed for two-way travel.

Shoulder—The portion of the roadway contiguous with the traveled way that accommodates stopped vehicles, emergency use, and lateral support of subbase, base, and surface courses. Shoulders, where paved, are often used by bicyclists.

Sidewalk—That portion of a street or highway right-of-way, beyond the curb or edge of roadway pavement, which is intended for use by pedestrians.

Sidepath—A shared use path located immediately adjacent and parallel to a roadway.

Traveled Way—The portion of the roadway intended for the movement of vehicles, exclusive of shoulders and any bike lane immediately inside of the shoulder.

Unpaved Path—Path not surfaced with a hard, durable surface such as asphalt or Portland cement concrete.

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