

# Guide for the Development of Bicycle Facilities

2012 • Fourth Edition



# Table of Contents

<b>Chapter 1: Introduction</b> .....	1-1
1.1 Design Imperative .....	1-1
1.2 Purpose.....	1-1
1.3 Scope.....	1-2
1.4 Definitions .....	1-2
<b>Chapter 2: Bicycle Planning</b> .....	2-1
2.1 Background .....	2-1
2.2 Why Planning for Bicycling is Important .....	2-1
2.3 Factors Influencing Bicycling Behavior .....	2-2
2.3.1 Trip Purpose .....	2-2
2.3.2 Level of User Skill and Comfort .....	2-4
2.4 Types of Transportation Planning Processes .....	2-6
2.4.1 Comprehensive Transportation Plans.....	2-6
2.4.2 Bicycle Master Plans .....	2-6
2.4.3 Transportation Impact/Traffic Studies.....	2-11
2.4.4 Small-Area and Corridor-Level Planning .....	2-12
2.4.5 Project Level Planning—Approvals.....	2-12
2.5 Planning Bicycle Transportation Networks .....	2-12
2.5.1 Deciding Where Improvements Are Needed.....	2-12
2.5.2 Practical (Opportunistic) Approach to Network Planning .....	2-14
2.5.3 Wayfinding for Bicycles .....	2-20
2.6 Technical Analysis Tools That Support Bicycle Planning .....	2-21
2.6.1 Data Collection and Flow Analysis .....	2-21
2.6.2 Quality of Service (or Level of Service) Tools .....	2-22
2.6.3 Safety Analysis .....	2-23
2.6.4 GIS-Based Data Collection/Network Planning.....	2-24
2.6.5 Bicycle Travel Demand Analysis.....	2-25
2.6.6 Cost-Benefit Analysis.....	2-26
2.6.7 Key Role of Public Input in the Process .....	2-26
2.7 Integrating Bicycle Facilities with Transit .....	2-27

<b>Chapter 3: Bicycle Operation and Safety</b> .....	3-1
3.1 Introduction .....	3-1
3.2 Design Vehicle .....	3-1
3.3 Traffic Principles for Bicyclists .....	3-4
3.4 Causes of Bicycle Crashes .....	3-6
3.4.1 Bicyclist Crash Studies .....	3-8
3.4.2 Overall Findings .....	3-8
3.4.3 Contributing Causes of Bicyclist-Motor Vehicle Crashes and Recommended Countermeasures.....	3-9
 <b>Chapter 4: Design of On-Road Facilities</b> .....	 4-1
4.1 Introduction .....	4-1
4.2 Elements of Design.....	4-1
4.3 Shared Lanes.....	4-2
4.3.1 Shared Lanes on Major Roadways (Wide Curb/Outside Lanes) .....	4-3
4.3.2 Signs for Shared Roadways .....	4-3
4.4 Marked Shared Lanes .....	4-4
4.5 Paved Shoulders.....	4-7
4.5.1 Shoulder Bypass Lanes.....	4-8
4.5.2 Rumble Strips.....	4-9
4.6 Bicycle Lanes .....	4-11
4.6.1 General Considerations .....	4-11
4.6.2 Bicycle Lanes on Two-Way Streets.....	4-12
4.6.3 Bicycle Lanes on One-Way Streets .....	4-12
4.6.4 Bicycle Lane Widths .....	4-14
4.6.5 Bicycle Lanes and On-Street Parking .....	4-16
4.7 Bicycle Lane Markings and Signs .....	4-17
4.7.1 Bicycle Lane Lines .....	4-17
4.7.2 Bicycle Lane Markings.....	4-18
4.7.3 Bicycle Lane Signs .....	4-21
4.8 Bicycle Lanes at Intersections.....	4-22
4.8.1 Right Turn Considerations .....	4-23
4.8.2 Left Turn Considerations .....	4-26
4.9 Retrofitting Bicycle Facilities on Existing Streets and Highways .....	4-28
4.9.1 Retrofitting Bicycle Facilities By Widening the Roadway .....	4-28
4.9.2 Retrofitting Bicycle Facilities Without Roadway Widening.....	4-29
4.10 Bicycle Boulevards .....	4-33
4.11 Bicycle Guide Signs/Wayfinding.....	4-34
4.12 Other Roadway Design Considerations .....	4-38

4.12.1	Railroad Grade Crossings .....	4-38
4.12.2.	Obstruction Markings .....	4-40
4.12.3	Bridges, Viaducts, and Tunnels .....	4-41
4.12.4	Traffic Signals .....	4-43
4.12.5	Detection for Bicycles at Traffic Signals.....	4-47
4.12.6	Bicycles and Traffic Calming .....	4-51
4.12.7	Bicycles and Traffic Management .....	4-53
4.12.8	Drainage Grates and Utility Covers .....	4-55
4.12.9	Bicycle Travel on Freeways.....	4-56
4.12.10	Bicycle Travel Through Interchange Areas.....	4-57
4.12.11	Bicycle Travel at Roundabouts .....	4-63

**Chapter 5: Design of Shared Use Paths .....** 5-1

5.1	Introduction .....	5-1
5.1.1	Accessibility Requirements for Shared Use Paths.....	5-2
5.2	Elements of Design.....	5-2
5.2.1	Width and Clearance.....	5-3
5.2.2	Shared Use Paths Adjacent to Roadways (Sidepaths).....	5-8
5.2.3	Shared Use with Mopeds, Motorcycles, Snowmobiles, and Horses .....	5-11
5.2.4	Design Speed.....	5-12
5.2.5	Horizontal Alignment.....	5-13
5.2.6	Cross Slope.....	5-15
5.2.7	Grade .....	5-16
5.2.8	Stopping Sight Distance .....	5-17
5.2.9	Surface Structure .....	5-25
5.2.10	Bridges and Underpasses.....	5-26
5.2.11	Drainage.....	5-28
5.2.12	Lighting.....	5-29
5.3	Shared Use Path Roadway–Intersection Design .....	5-30
5.3.1	Shared Use Path Crossing Types .....	5-30
5.3.2	Design of Mid-Block Crossings .....	5-31
5.3.3	Examples of Mid-Block Intersection Controls .....	5-38
5.3.4	Sidepath Intersection Design Considerations.....	5-42
5.3.5	Other Intersection Treatments .....	5-45
5.3.6	Additional Bicycle Crossing Considerations.....	5-49
5.4	Pavement Markings, Signs, and Signals.....	5-50
5.4.1	Pavement Markings .....	5-50
5.4.2	Signs.....	5-52
5.4.3	Signalized and Active Warning Crossings.....	5-54

<b>Chapter 6: Bicycle Parking Facilities</b> .....	6-1
6.1 Introduction .....	6-1
6.2 Planning for Bicycle Parking.....	6-1
6.3 Short-Term Bicycle Parking Facilities.....	6-2
6.3.1 Site Design .....	6-3
6.3.2 Rack Design .....	6-3
6.3.3 Considerations for Special Types of Racks.....	6-4
6.4 Long-Term Bicycle Parking Facilities .....	6-4
<b>Chapter 7: Maintenance and Operations</b> .....	7-1
7.1 Introduction .....	7-1
7.2 Recommended Maintenance Programs and Activities .....	7-1
7.2.1 Sweeping .....	7-2
7.2.2 Surface Repairs .....	7-2
7.2.3 Pavement Overlays .....	7-3
7.2.4 Vegetation .....	7-3
7.2.5 Traffic Signal Detectors.....	7-4
7.2.6 Signs and Markings .....	7-4
7.2.7 Drainage Improvements .....	7-4
7.2.8 Chip Sealing.....	7-5
7.2.9 Patching Activities .....	7-5
7.2.10 Utility Cuts .....	7-5
7.2.11 Snow Clearance .....	7-6
7.3 Operating Bikeways in Work Zones.....	7-6
7.3.1 Rural Highway Construction.....	7-7
7.3.2 Urban Roadway Construction .....	7-7
<b>Index</b> .....	I-1

# List of Figures

## Chapter 2

Figure 2-1	Typical Wayfinding Signs.....	2-20
------------	-------------------------------	------

## Chapter 3

Figure 3-1	Bicyclist Operating Space.....	3-2
Figure 3-2	Typical Bicycle Dimensions.....	3-3
Figure 3-3	Common Maneuvers for Bicyclists Turning Left at an Intersection .....	3-7

## Chapter 4

Figure 4-1	“Share The Road” Sign Assembly .....	4-3
Figure 4-2	Bicycles “May Use Full Lane” Sign.....	4-3
Figure 4-3	“Wrong Way—Ride With Traffic” Sign Assembly .....	4-4
Figure 4-4	Shared-Lane Marking .....	4-5
Figure 4-5	Typical Shared-Lane Marking Cross Section on Street with Parking.....	4-6
Figure 4-6	Typical Shared-Lane Marking Cross Section on Street with No On-Street Parking.....	4-6
Figure 4-7	Shoulder Bypass Lane .....	4-8
Figure 4-8	Rumble Strips .....	4-9
Figure 4-9	Rumble Strip Design Parameters.....	4-10
Figure 4-10	Example of Paved Shoulder Designated as Bicycle Lane .....	4-11
Figure 4-11	Shared-Lane Marking and Bike Lane on Steep Street .....	4-12
Figure 4-12	Typical Markings for One-Way Street Designed for Two-Way Bicycle Travel .....	4-13
Figure 4-13	Typical Bike Lane Cross Sections .....	4-15
Figure 4-14	Example of Bike Lane Adjacent to Parallel Parking .....	4-16
Figure 4-15	Example of Bike Lane Adjacent to Back-in Diagonal Parking.....	4-17
Figure 4-16	Typical Bike Lane Pavement Markings.....	4-19
Figure 4-17	Bike Lane Symbol Markings .....	4-20
Figure 4-18	Example of Symbol Placement to Avoid Premature Wear.....	4-21
Figure 4-19	Bike Lane Sign.....	4-22
Figure 4-20	Examples of Bike Lanes Approaching Right-Turn-Only Lanes (With and Without Parking).....	4-24

Figure 4-21	Example of Bike Lane with Through Lane Transitioning to Right-Turn-Only Lane.....	4-25
Figure 4-22	Example of Bike Left-Turn-Only Lane.....	4-27
Figure 4-23	Example of Road Diet.....	4-31
Figure 4-24	Road Diet—Before and After.....	4-32
Figure 4-25	D11 Series Bicycle Route Signs.....	4-34
Figure 4-26	Wayfinding Signs.....	4-35
Figure 4-27	Typical Bicycle Guide Signage Layout.....	4-37
Figure 4-28	Correction for Skewed Railroad Grade Crossing—Separate Pathway ....	4-39
Figure 4-29	Correction for Skewed Railroad Grade Crossing—Widened Shoulder ..	4-40
Figure 4-30	Obstruction Marking.....	4-41
Figure 4-31	Diagonal Quadrupole Loop Detector .....	4-48
Figure 4-32	Conventional Quadrupole Loop Detector .....	4-48
Figure 4-33	Typical Bicycle Detector Pavement Marking .....	4-49
Figure 4-34	Bicycle Detector Pavement Marking and Sign .....	4-49
Figure 4-35	Examples of Bicycle-Friendly Approach Profiles for Speed Humps and Speed Tables.....	4-51
Figure 4-36	Curb Extensions .....	4-53
Figure 4-37	Choker with Bicycle Access.....	4-55
Figure 4-38	Bicycle-Compatible Drainage Grates.....	4-56
Figure 4-39	Example of Bike Lane on the Crossroad at a Freeway Interchange.....	4-58
Figure 4-40	Single-Point Diamond Interchange (SPDI).....	4-59
Figure 4-41	Option 1—Bike Lane and Free-Flow Merging Roadway.....	4-61
Figure 4-42	Option 2—Bike Lane and Free-Flow Merging Roadway .....	4-61
Figure 4-43	Example of Bike Lane and Diverging Roadway on an Arterial Street.....	4-62
Figure 4-44	Typical Layout of Roundabout with Bike Lanes (4) .....	4-64

## Chapter 5

Figure 5-1	Typical Cross Section of Two-Way Shared Use Path on Independent Right-of-Way .....	5-4
Figure 5-2	Minimum Width Needed to Facilitate Passing on a Shared Use Path ....	5-4
Figure 5-3	Safety Rail Between Path and Adjacent Slope.....	5-7
Figure 5-4	Sidepath Conflicts.....	5-10
Figure 5-5	Shared Use Path with Separate Unpaved Equestrian/Jogger Path.....	5-12
Figure 5-6	Minimum Stopping Sight Distance vs. Grades for Various Design Speeds—Ascending Climbing Grade.....	5-18
Figure 5-7	Minimum Stopping Sight Distance vs. Grades for Various Design Speeds—Descending Climbing Grade .....	5-19

Figure 5-8	Minimum Length of Crest Vertical Curve Based on Stopping Sight Distance.....	5-21
Figure 5-9	Diagram Illustrating Components for Determining Horizontal Sight Distance.....	5-23
Figure 5-10	Minimum Lateral Clearance (Horizontal Sightline Offset or HSO) for Horizontal Curves .....	5-24
Figure 5-11	Bridge Railing.....	5-27
Figure 5-12	Example of Bridge Structures .....	5-28
Figure 5-13	Mid-block and Sidepath Crossings Relative to Intersection Functional Area .....	5-31
Figure 5-14	Crossing Angle.....	5-32
Figure 5-15	Yield Sight Triangles.....	5-35
Figure 5-16	Minimum Path-Walkway Sight Triangle.....	5-37
Figure 5-17	Example of Mid-block Path–Roadway Intersection—Path is Yield Controlled for Bicyclists.....	5-39
Figure 5-18	Example Midblock Path–Roadway Intersection—Roadway is Yield Controlled .....	5-40
Figure 5-19	Example of Mid-block Path–Roadway Intersection—Path is Stop Controlled for Bicyclists.....	5-19
Figure 5-20	Example Mid-block Path–Roadway Intersection—Roadway is Stop Controlled .....	5-42
Figure 5-21	Bollard Approach Markings .....	5-47
Figure 5-22	Crossing Island .....	5-48
Figure 5-23	Advance Yield Signs and Markings.....	5-52
Figure 5-24	Advance Warning Assembly Example.....	5-53
Figure 5-25	Mode-Specific Guide Signs .....	5-54

## Chapter 6

Figure 6-1	Directional Signage for Bicycle Storage .....	6-2
Figure 6-2	Example of “Inverted U” Bicycle Rack.....	6-3



# List of Tables

## Chapter 2

Table 2-1	Recreational Trips vs. Utilitarian Trips.....	2-4
Table 2-2	Casual/Less Confident vs. Experienced/Confident Riders.....	2-5
Table 2-3	General Considerations for Different Bikeway Types.....	2-17

## Chapter 3

Table 3-1	Key Dimensions.....	3-3
Table 3-2	Key Performance Criteria.....	3-4

## Chapter 4

Table 4-1	Formula for Determining Taper Length for Obstruction Markings.....	4-41
Table 4-2	Standing Bicycle Crossing Time.....	4-44
Table 4-3	Bicycle Minimum Green Time Using Standing Bicycle Crossing Time.....	4-45
Table 4-4	Rolling Bicycle Crossing Time Considering Braking Distance.....	4-46
Table 4-5	All-Red and Extension Time Using Rolling Bicycle Crossing Time.....	4-47

## Chapter 5

Table 5-1	Minimum Radius of Curvature Based on Lean Angle.....	5-14
Table 5-2	Minimum Radii for Horizontal Curves on Paved, Shared Use Paths at 20-Degree Lean Angle.....	5-14
Table 5-3	Minimum Radius of Curvature Based on Superelevation.....	5-15
Table 5-4	Minimum Stopping Sight Distance.....	5-17
Table 5-5	Length of Crest Vertical Curve to Provide Sight Distance.....	5-20
Table 5-6	Horizontal Sight Distance.....	5-23
Table 5-7	Length of Roadway Leg of Sight Triangle.....	5-35
Table 5-8	Length of Path Leg of Sight Triangle.....	5-36
Table 5-9	Taper Length.....	5-49

# 1



Photo courtesy of Alaska DOT.

## 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.

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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# Index

- Active warning crossings**, 5-54
- Advance stop**, 5-51, 5-56
- Aesthetics**, 2-14
- A Policy on Geometric Design of Highways and Streets***, 1-4, 4-7, 4-23, 4-28, 4-30, 4-66, 5-34, 5-36, 5-55
- Approach markings**, 5-47, 5-51
- Bicycle**
  - boulevards, 2-5, 2-12, 2-19, 2-20, 3-11, 4-33, 4-34, 4-54, 5-2
  - crashes, 2-4, 2-8, 2-9, 2-11, 2-12, 2-14, 2-17, 2-23, 2-24, 2-25, 3-1, 3-6, 3-8, 3-9, 3-10, 3-11, 4-9, 4-12, 4-16, 4-28, 4-30, 4-31, 4-36, 4-54, 4-56, 4-57, 4-62, 4-63, 5-8, 5-9, 5-13, 5-15, 5-23, 5-27, 5-30, 5-33, 5-34, 5-42, 5-43, 5-44, 5-48, 5-49, 5-51, 7-2
  - route, 1-3, 2-20, 4-5, 4-23, 4-26
- Bicycle Detector Pavement Marking**, 4-49
- Bicycle Lane**, 1-2, 4-11, 4-14, 4-17, 4-18, 4-21, 4-60, 4-62
  - lines, 4-17
  - markings, 4-17
  - signs, 4-21
  - widths, 4-14
- Bicycle Level of Service (BLOS)**, 1-3, 2-22, 2-29
- Bicycle Master Plans**, 2-6
- Bicycle Travel Demand Analysis**, 2-25
- Bicyclist Crash Studies**, 3-8
- Bridges**, 2-8, 2-15, 4-28, 4-41, 4-42, 4-43, 5-6, 5-27, 5-28
- Child trailer**, 3-3, 3-4
- Chip sealing**, 7-5
- Construction**, 1-1, 1-2, 2-8, 2-11, 2-12, 2-26, 4-28, 4-51, 5-16, 5-25, 5-28, 7-2, 7-6, 7-7
- Corridor-level planning**, 2-6, 2-12
- Cost-benefit analysis**, 2-14, 2-21
- Crossing**
  - angle, 4-38, 5-32
  - island, 5-33
  - surfaces, 4-38
- Cross Slope**, 5-15
- Data collection**, 2-9, 2-21, 2-24, 2-25
- Design**
  - speed, 2-17, 2-18, 4-64, 4-65, 5-3, 5-12, 5-13, 5-14, 5-15, 5-27, 5-35, 5-36
  - vehicle, 3-1, 4-51, 5-36
- Diverters**, 2-19, 4-33, 4-54
- Drainage**
  - grates, 4-2, 4-3, 4-29, 4-55, 5-26, 5-28, 7-5
  - improvements, 7-4
- Elements of Design**, 5-2
- Flow analysis**, 2-21
- GIS-based data**, 2-21

- Grade**, 2-11, 2-23, 4-12, 4-38, 4-42, 4-52, 4-57, 4-60, 4-62, 4-63, 5-12, 5-16, 5-17, 5-20, 5-27, 5-28, 5-30, 5-31, 5-42, 5-49
- Guide signs**, 4-36, 5-52, 5-54
- Horizontal alignment**, 5-13, 5-16
- Infrastructure**, 1-2, 2-6, 2-8, 2-9, 2-11, 2-15, 2-25, 7-1, 7-2
- Inline skaters**, 3-3, 3-9, 5-3, 5-20, 5-25
- Interchanges**, 2-8, 4-57, 4-60, 4-62, 4-63, 5-49
- Intersection design**, 4-22, 5-11, 5-30, 5-33
- Intersections**, 2-2, 2-5, 2-8, 2-13, 2-16, 2-18, 2-19, 2-20, 2-22, 2-23, 2-24, 2-28, 3-1, 3-6, 3-8, 3-9, 3-10, 3-11, 4-4, 4-7, 4-8, 4-13, 4-17, 4-18, 4-20, 4-22, 4-23, 4-26, 4-30, 4-32, 4-33, 4-35, 4-37, 4-43, 4-51, 4-52, 4-53, 4-54, 4-57, 4-59, 4-60, 4-63, 5-8, 5-9, 5-10, 5-11, 5-29, 5-30, 5-32, 5-33, 5-34, 5-38, 5-42, 5-43, 5-44, 5-45, 5-46, 5-48, 5-49, 5-50, 5-51, 5-53, 5-55, 7-4, 7-5
  - acute-angle, 4-23
- Lateral clearance**, 5-22
- Lean angle**, 5-13, 5-14, 5-16
- Left turn**, 3-5, 3-6, 4-5, 4-26, 4-31, 4-57, 5-9
- Lighting**, 3-4, 3-8, 3-9, 3-11, 4-22, 4-43, 4-50, 4-63, 5-29, 5-30
- Lockers**, 6-5
- Long-term bicycle parking facilities**, 6-4, 6-5
- Maintenance programs**, 7-1
- Manual on Uniform Traffic Control Devices (MUTCD)**, 1-2, 1-4, 2-20, 2-28, 4-4, 4-5, 4-17, 4-18, 4-20, 4-21, 4-34, 4-35, 4-36, 4-40, 4-47, 4-66, 5-3, 5-5, 5-15, 5-16, 5-17, 5-23, 5-33, 5-38, 5-46, 5-47, 5-50, 5-51, 5-52, 5-53, 5-54, 5-55, 5-56, 6-2, 6-5, 7-6, 7-7
- Mid-block crossings**, 5-32, 5-34, 5-54
- Mid-block intersection controls**, 5-38
- Network planning**, 2-6, 2-21
- Obstruction markings**, 4-40, 4-41
- One-way streets**, 2-27, 4-12, 4-25, 4-32
- On-road facilities**, 4-1
- On-street parking**, 2-17, 2-23, 3-5, 3-8, 4-2, 4-3, 4-12, 4-14, 4-15, 4-16, 4-18, 4-21, 4-29, 4-30, 4-32, 4-33, 4-52, 5-44
- Parallel parking**, 4-4, 4-5, 4-16, 4-17, 4-33
- Patching activities**, 7-5
- Paved shoulders**, 2-2, 2-5, 2-7, 2-8, 2-12, 2-19, 2-20, 3-11, 4-3, 4-4, 4-5, 4-7, 4-8, 4-28, 4-29, 4-30, 4-41, 4-42, 4-57, 5-2, 5-8, 7-6
- Pavement**
  - markings, 1-2, 2-7, 2-27, 4-11, 4-17, 4-22, 4-28, 4-34, 5-23, 5-25, 5-46, 5-50, 5-51
  - overlays, 7-3
- Project Level Planning**, 2-12
- Public Rights-of-Way Accessibility Guidelines (PROWAG)**, 5-2, 5-48
- Quality of Service (or Level of Service) Tools**, 2-22
- Rack Design**, 6-3
- Radius of curvature**, 5-13, 5-14, 5-15, 5-22
- Railroad Grade Crossings**, 4-38
- Recreational trips**, 2-3
- Recumbent bicycle**, 3-3
- Retrofitting**, 2-7, 2-27, 4-7, 4-11, 4-28
- Right of way**, 4-43, 5-32, 5-33, 5-43, 5-44, 5-50
- Right turn**, 4-23, 4-24, 4-57



**Road diet**, 4-30

**Roadway widening**, 2-11, 4-28

**Roundabouts**, 3-9, 4-26, 4-33, 4-52, 4-57, 4-63, 4-64, 4-65

**Rumble strips**, 1-3, 4-9, 4-10, 4-56, 5-11

**Rural Highway Construction**, 7-7

**Safety analysis**, 2-21

**Shared lane**, 1-4, 2-8, 2-16, 3-10, 3-11, 4-3, 4-4, 4-43

**Shared-lane markings**, 3-10, 4-3, 4-4, 4-5, 4-12, 4-13, 4-25, 4-43, 4-64

**Shared roadway**, 2-22, 4-34

**Shared use path**, 1-3, 1-4, 2-2, 2-16, 2-22, 3-1, 4-3, 4-4, 4-36, 4-38, 4-41, 4-42, 4-56, 4-65, 5-3, 5-4, 5-6, 5-8, 5-11, 5-12, 5-16, 5-26, 5-27, 5-28, 5-29, 5-30, 5-31, 5-37, 5-45, 5-46, 5-49, 5-50, 5-53, 5-54, 5-55

crossing type

- grade-separated, 5-30
- mid-block, 5-30
- sidepath, 5-30

**Short-term bicycle parking facilities**, 6-2

**Shoulder**, 1-4, 2-9, 2-10, 2-13, 2-17, 2-18, 2-24, 4-7, 4-8, 4-9, 4-10, 4-11, 4-21, 4-28, 4-29, 4-38, 4-42, 4-56, 4-57, 4-60, 5-5, 5-11, 7-3, 7-5, 7-6

**Shoulder bypass lanes**, 4-8

**Sidepath**, 1-4, 5-30, 5-31, 5-32, 5-42, 5-43, 5-56

**Signs**, 1-2, 1-3, 2-13, 2-19, 2-20, 2-21, 2-27, 3-10, 3-11, 4-3, 4-4, 4-11, 4-14, 4-17, 4-21, 4-22, 4-34, 4-35, 4-36, 4-37, 4-53, 4-54, 5-3, 5-5, 5-9, 5-13, 5-15, 5-23, 5-34, 5-38, 5-44, 5-45, 5-46, 5-50, 5-51, 5-52, 5-53, 5-54, 5-55, 7-4, 7-6, 7-7

**Signs and markings**, 5-52, 7-4

**Site design**, 6-3

**Snow clearance**, 7-6

**Speeds**, 1-3, 2-3, 2-5, 2-9, 2-13, 2-16, 2-18, 2-19, 2-23, 2-24, 3-1, 3-4, 3-9, 3-10, 3-11, 4-2, 4-4, 4-7, 4-8, 4-9, 4-11, 4-12, 4-14, 4-15, 4-17, 4-23, 4-24, 4-26, 4-28, 4-30, 4-31, 4-32, 4-33, 4-36, 4-40, 4-42, 4-43, 4-45, 4-46, 4-51, 4-52, 4-53, 4-54, 4-57, 4-60, 4-62, 4-63, 4-65, 5-2, 5-8, 5-12, 5-13, 5-14, 5-15, 5-16, 5-17, 5-20, 5-30, 5-33, 5-34, 5-36, 5-42, 5-43, 5-44, 5-46, 5-48, 5-49, 5-50, 7-7

**Stopping sight distance**, 4-1, 4-2, 5-16, 5-17, 5-20, 5-22, 5-23, 5-34, 5-35, 5-37, 5-50, 5-52, 5-53

**Striping**

- centerline, 5-50
- edgeline, 5-51

**Superelevation**, 5-13, 5-14, 5-15, 5-16

**Surface repairs**, 7-2

**Surface structure**, 5-25

**Sweeping**, 7-2

**Tandem bicycle**, 3-3

**Technical analysis tools**, 2-21

**Topography**, 2-4, 2-26, 5-27

**Traffic**

- calming, 3-10, 4-33, 4-51, 4-52, 4-53, 4-63
- management, 4-53
- principles, 3-1, 3-5
- signal, 2-8, 4-34, 4-43, 4-46, 4-50, 4-57, 4-59, 5-9, 5-54
- signal detectors, 7-4
- volumes, 2-5, 2-9, 2-13, 2-18, 2-20, 2-23, 3-6, 3-11, 4-2, 4-7, 4-30, 4-32, 4-33, 4-56, 4-57, 4-63, 5-33, 5-38, 7-7



**Transit**, 2-1, 2-2, 2-4, 2-6, 2-7, 2-8, 2-9,  
2-10, 2-11, 2-13, 2-15, 2-25, 2-26,  
2-27, 2-28, 4-5, 5-29, 6-2, 6-3, 6-5

**Transportation Impact/Traffic Studies**, 2-6,  
2-11

**Transportation networks**, 2-12

**Traveled way**, 1-3, 1-4, 4-3, 4-4, 4-5, 4-9,  
4-16, 4-20, 4-52, 4-55, 5-11, 5-51,  
5-54, 7-2, 7-5

**Tunnels**, 4-41, 4-42

**Two-way streets**, 4-12

**Underpasses**, 5-26

**Unpaved paths**, 5-12, 5-15, 5-25

**Urban roadway construction**, 7-7

**Utilitarian trips**, 2-2, 2-3, 2-26

#### **Utility**

covers, 4-11, 4-56, 5-26

cuts, 7-5

**Vegetation**, 7-3

**Vertical curve**, 4-7, 5-20, 5-21, 5-22

**Viaducts**, 4-41

**Warning sign assembly**, 5-53

**Wayfinding**, 2-8, 2-20, 2-21, 2-27, 4-34,  
4-36, 5-52, 5-54

**Width and clearance**, 5-3

**Work zones**, 7-6

**Yield lines**, 5-51