
	<p><i>Chapter</i></p> <p>ADDITIONAL DESIGN TOPICS</p>
	<p><i>Subject</i></p> <p>Introduction</p>

OVERVIEW:

This chapter contains information about additional highway design topics. These include guidelines for pedestrian and bicycle accommodations, parking spaces for the disabled, and lake impoundment by highway fills.

There are many different elements that influence the overall highway development process. The intent of this chapter is to introduce and discuss topics not addressed elsewhere in this manual that also require the attention of the designer. Awareness of these topics will assist the project development team, project manager, and designer in the development of highway projects.



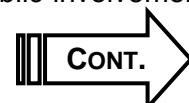
	<p><i>Chapter</i></p> <p>ADDITIONAL DESIGN TOPICS</p>
	<p><i>Subject</i></p> <p>Guidelines for Pedestrian & Bicycle Accommodations</p>

OVERVIEW: It is the Kentucky Transportation Cabinet’s policy to enhance operational efficiency, promote program goals, and enrich the quality of life through the development of a Pedestrian and Bicycle Travel Program. The following guidance describes where and when to include pedestrian facilities in roadway projects. The decision to include pedestrian and bicycle facilities needs to be documented within the design executive summary.

PEDESTRIAN FACILITIES ON URBAN ROADWAYS:

The Project Development Team (PDT) will consider incorporating pedestrian facilities on all new or reconstructed roadways in existing and planned urban and suburban areas if the roadway project involves one or more of the following factors:

- A pedestrian facility already exists on the current roadway.
- The recommended roadway cross-section is urban (curb and gutter).
- Project limits are adjacent to an existing residential, commercial, industrial, institutional, public, or semi-public use area or adjacent to an area planned to develop one of these uses within the next 20 years. Planned development may be determined by zoning designations, a local comprehensive plan, or the public-involvement process.
- A state, locally, or regionally adopted pedestrian network or policy has designated pedestrian improvements in the area of the specific roadway project or for that classification of roadway.
- A KYTC Small Urban Transportation Study has specific pedestrian improvements recommended for the roadway project.
- Pedestrian traffic exists along the current roadway. This may be determined by the observation of pedestrian traffic or by the public-involvement process.
- Public interest in and demand for pedestrian facilities are determined at the planning and preliminary engineering public-involvement stages.



**PEDESTRIAN
FACILITIES
ON URBAN
ROADWAYS
(cont.):**

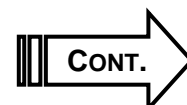
Other factors that should be considered when determining the need for pedestrian facilities include the following:

- Project-level decisions will complement local pedestrian plans to the maximum reasonable extent.
- Project-level decisions will evaluate future connections to close gaps in parallel connectivity between projects and developed areas/community destinations or existing pedestrian facilities within 300 feet beyond normal project limits and within existing publicly owned rights of way.
- Project-level decisions will evaluate future connections to close gaps in perpendicular connectivity to developed areas/community destinations or existing pedestrian facilities within 100 feet of the roadway edge of pavement and within existing publicly owned rights of way.
- Project-level decisions will consider pedestrian access to existing and planned transit stops.

**PEDESTRIAN
FACILITIES
ON RURAL
ROADWAYS:**

The PDT will consider the incorporation of pedestrian facilities on all new or reconstructed roadways in rural areas if the roadway project involves one or more of the following factors:

- Pedestrian traffic exists along the current roadway: This may be determined by the observation of pedestrian traffic or by the public-involvement process.
- Project limits are adjacent to planned or anticipated development within the next 20 years of residential subdivisions; commercial, industrial, institutional, public, or semi-public use area; or other projects necessitating pedestrian connectivity. Planned development may be determined by zoning designations from a local comprehensive land use plan, interviews with local political and economic leaders to gauge anticipated growth in the project area, or the public-involvement process.
- A state, locally, or regionally adopted pedestrian network or policy has designated pedestrian improvements in the area of the specific roadway project or for that classification of roadway.



PEDESTRIAN FACILITIES ON RURAL ROADWAYS (cont.):

- Gaps in connectivity exist between two or more developed areas/community destinations currently separated by no more than 1.5 miles.
- Public interest in and demand for pedestrian facilities are determined at the planning and preliminary engineering public-involvement stages.

CHOOSING TYPES OF PEDESTRIAN FACILITIES:

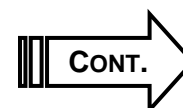
After determining that a pedestrian facility is necessary, the design team then selects the type of facility. Listed below are the options for both urban and rural areas. Each standard default option is the minimum that the design team may include. The team may choose other options if it determines a need by the use of data or public input.

Urban Areas	
Standard Default	5' sidewalks with 2' (minimum) buffer strip on both sides of the roadway
Other Options	10' or wider sidewalks in heavily traveled pedestrian areas
	10' or wider shared use path (two-way directional travel)
	Shoulders (for rural cross-section in urban areas): minimum width based on KYTC policy as stated in HD-700 , "Geometric Design Guidelines"
	10' shared use path with 5' sidewalk on opposite side
Rural Areas	
Standard Default	Shoulders: minimum width based on KYTC policy as stated in <i>Highway Design Manual</i> , HD-700 , "Geometric Design Guidelines"
Other Options	10' or wider shared use path (two-way directional travel)
	5' sidewalk with 2' (minimum) buffer strip on both sides of the roadway (for urban cross-section in rural areas)

More information concerning pedestrian facilities may be found in AASHTO's *Guide for the Planning, Design, and Operation of Pedestrian Facilities*.

SHARED USE PATH:

A shared use path serves as part of a transportation circulation system and supports multiple modes, such as walking, bicycling, and inline skating. A shared use path typically has a surface that is asphalt, concrete, or firmly packed crushed aggregate. The 1999 AASHTO *Guide for the Development of Bicycle Facilities* defines a shared use path as being physically separated from motor vehicular traffic with an open space or barrier. Shared use paths are best utilized in areas where driveway and road access crossings are limited, in order to minimize the number of motor vehicle–path-user conflicts.

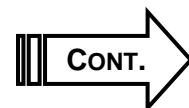


**BICYCLE
FACILITIES:**

In the Commonwealth of Kentucky, bicycles are considered, by statute, to be legal vehicles, and as such are permitted on all roadways within the state, except on those where they are specifically prohibited (e.g., parkways and interstate highways). Bicycles can safely share the roadways with motor vehicles when appropriate consideration is made during the design and construction of new or reconstructed roadways. Bicycle traffic should be expected on all roadways except interstate highways and other fully controlled access highways, but each location merits a different type of accommodation. Accommodation includes signage, rumble-strip design, bicycle-friendly grates, wide curb lanes, shoulder bikeways, bicycle lanes, and shared use paths.

The Project Development Team (PDT) will consider incorporating bicycle facilities on all new or reconstructed roadways (including the resurfacing of roadways and shoulders) in existing and planned urban, suburban, and rural areas when the roadway project involves one or more of the following factors:

- A bicycle facility already exists on the current roadway.
- Project limits are adjacent to an existing residential, commercial, office, industrial, institutional, public, or semi-public use area or adjacent to an area planned to develop into one of these uses within the next 20 years. Planned development may be determined by a local comprehensive plan or the public-involvement process.
- A state, locally, or regionally adopted bicycle plan has designated bicycle improvements or a bikeway in the area of the specific roadway project or for that classification of roadway.
- A KYTC Small Urban Transportation Study has specific bicycle improvements recommended for the roadway project.
- Bicycle traffic exists along the current roadway. This may be determined by the observation of bicycle traffic or by the public-involvement process.
- Public interest in and demand for bicycle accommodations are determined at the planning and preliminary engineering public-involvement stages.



BICYCLE FACILITIES (cont.):

Other factors that should be considered when determining the need for bicycle facilities include:

- Project-level decisions will complement local bicycle plans to the maximum reasonable extent.
- Project-level decisions will evaluate future connections to close gaps in parallel connectivity between projects and developed areas/community destinations or existing bicycle facilities within 300 feet beyond normal project limits and within existing publicly owned rights of way.
- Project-level decisions will evaluate future connections to close gaps in perpendicular connectivity to developed areas/community destinations or existing bicycle facilities within 100 feet of the roadway edge of pavement within existing publicly owned rights of way.

CHOOSING TYPES OF BICYCLE FACILITIES:

After determining that a bicycle facility is necessary, the designer then selects the type of facility. **Exhibit 1500-01** contains three tables to aid the designer in the selection of facility type. The three tables are organized by type of roadway cross-section that may be used. They are:

- Rural Cross-section
- Urban Cross-section with No Parking
- Urban Cross-section with Parking

Within each table, design speed and projected daily traffic are considered in making the selection of the facility. The tables show recommended bicycle facility types and widths.

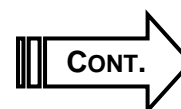
The bicycle facility types in **Exhibit 1500-01** are shared lanes, paved shoulders, wide curb lanes, and bicycle lanes. Brief descriptions of these facilities are as follows:

Shared Lanes:

Width is the most critical variable affecting the ability of a roadway to accommodate bicycle traffic. In order for bicycles and motor vehicles to share the roadway without compromising the level of service and safety for either, the facility should provide sufficient paved width. Bicycle-safe drainage inlets shall be used when bicyclists are anticipated in roadways with curb and gutters.

Paved Shoulders:

Adding or improving paved shoulders often can be the best way to accommodate bicyclists in rural areas and benefit motor vehicle traffic.



BICYCLE FACILITIES (cont.):

Kentucky Shoulder Bikeways:

Bikeway is a generic term for any road, street, path, or way that 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.

- Shoulder bikeways should have a minimum of 4 feet of paved surface beyond rumble strips, 5 feet when guardrail is present; however, 6 feet is preferred.
- No additional striping should be applied to designate a shoulder bikeway.



W11-1



W16-1



D11-1

Signage, using the bicycle warning (W11-1) or SHARE THE ROAD sign (W16-1), is recommended to designate a shoulder bikeway. A bike route sign (D11-1) may be used with the SHARE THE ROAD sign if the shoulder bikeway connects to another bike trail or shared use path.

- The bicycle lane symbol should not be used as pavement marking on a shoulder bikeway. The bicycle lane symbol is used to designate facilities exclusive to bicycle use and is not appropriate on a shoulder bikeway.

Wide Curb Lanes:

In many situations, it may be appropriate to add additional width to the outside lane to accommodate bicycles. Wide curb lanes for bicycle use are usually preferred where shoulders are not provided, such as in restrictive urban areas. An outside or curb lane wider than 12 feet can better accommodate both bicycles and motor vehicles in the same lane. In many cases where there is a wide curb lane, motorists will not need to change lanes to pass a bicyclist. Bicycle-safe drainage inlets shall be used in conjunction with widened pavements

In general, 14 feet of usable lane width is the recommended width for shared use in a wide curb lane. Usable width normally would be from edge stripe to lane stripe or from the longitudinal joint of the gutter pan to lane stripe (the gutter pan should not be included as usable width).



**BICYCLE
FACILITIES****(cont.):**


Restriping to provide wide curb lanes may also be considered on some existing multi-lane facilities by making the remaining travel lanes and left-turn lanes narrower. An engineering analysis based on applicable design criteria and a careful review of traffic characteristics will be provided to aid any decision for restriping existing facilities.

Bicycle Lanes:

Bike lanes can be incorporated into a roadway when it is desirable to delineate available road space for preferential use by bicyclists and motorists and to provide for more predictable movements by each. Bike lanes should be one-way facilities and carry bike traffic in the same direction as adjacent motor vehicle traffic. On one-way streets, bike lanes should generally be placed on the right side of the street. Bike lanes on the left side are unfamiliar and unexpected to most motorists.

The recommended width of a bike lane is generally 5 to 6 feet from the face of a curb or guardrail to the lane stripe (the width of the gutter pan is included). For roadways with no curb and gutter or guardrail, the minimum width of a bike lane should be 4 feet.



	Chapter ADDITIONAL DESIGN TOPICS
	Subject Parking Spaces for the Disabled

GUIDELINES: The following chart provides guidance in accordance with the American Disabilities Act (ADA) and federal guidelines for the minimum number of parking spaces for the disabled, which are to be included in any public parking facility. Label these spaces clearly on any plans for parking lots.

PARKING LOTS	
TOTAL PARKING SPACES	REQUIRED ACCESSIBLE SPACES
1 to 25	1
26 to 50	2
51 to 75	3
76 to 100	4
101 to 150	5
151 to 200	6
201 to 300	7
301 to 400	8
401 to 500	9
501 to 1,000	2% of total
1,001 and over	20 plus 1 for each 100 over 1,000

Access aisles adjacent to accessible spaces are to be a minimum of 60 inches wide. ADA also has a requirement that one of eight accessible parking spaces, but always at least one in each lot, must be van accessible. Access areas adjacent to van spaces must be a minimum of 96 inches. Specific signing for van parking is also required. See the *Americans with Disabilities Act Accessibility Guidelines (ADAAG)* for more information.



RECOMMENDED BICYCLE FACILITY TYPES RURAL CROSS SECTION

POSTED SPEED LIMIT	AVERAGE ANNUAL DAILY TRAFFIC (AADT) VOLUME (DESIGN YEAR)		
	LESS THAN 2000	2000 - 10,000	OVER 10,000
LESS THAN 30 MPH	12' SL	12' SL ①	6' SH
30 - 40 MPH	6'-SH	6'-SH	6'-SH
41 - 50 MPH	6'-SH	6'-SH	6'-SH
OVER 50 MPH	6'-SH	6'-SH	6'-SH

RECOMMENDED BICYCLE FACILITY TYPES URBAN CROSS SECTION (NO PARKING)

POSTED SPEED LIMIT	AVERAGE ANNUAL DAILY TRAFFIC (AADT) VOLUME (DESIGN YEAR)		
	LESS THAN 2000	2000 - 10,000	OVER 10,000
LESS THAN 30 MPH	12' SL	14' WC	5' BL
30 - 40 MPH	5'-BL	5'-BL	5'-BL
41 - 50 MPH	5'-BL	6'-BL	6'-BL
OVER 50 MPH	6'-BL	6'-BL	6'-BL

RECOMMENDED BICYCLE FACILITY TYPES URBAN CROSS SECTION (PARKING)

POSTED SPEED LIMIT	AVERAGE ANNUAL DAILY TRAFFIC (AADT) VOLUME (DESIGN YEAR)		
	LESS THAN 2000	2000 - 10,000	OVER 10,000
LESS THAN 30 MPH	14' WC	14' WC	5' BL
30 - 40 MPH	5'-BL	5'-BL	6'-BL
41 - 50 MPH	6'-BL	6'-BL	6'-BL
OVER 50 MPH	NA	NA	NA

LEGEND: WC = WIDE CURB LANE SH = PAVED SHOULDER
SL = SHARED LANE BL = BICYCLE LANE ②

- ① WHEN PROJECTED TRUCK VOLUMES EXCEED 30 TRUCKS PER HOUR USE 6' - SH.
② THE WIDTH OF BICYCLE LANE INCLUDES THE WIDTH OF GUTTER PAN.