

## CHANGE LOG

### PROJECT DEVELOPMENT AND DESIGN GUIDE



CHAPTER NO./TITLE 6. Intersection Design

EFFECTIVE DATE August 18, 2025

SECTION	CHANGE
General	Agency name has been updated to MassDOT throughout.
General	Various minor grammatical changes and nomenclature changes for consistency within this chapter and throughout the Guide.
General	Added hyperlinks to external resources.
General	Changed all Exhibit numbers to separate Table and Figure numbers.
General	Updated figures, tables and their sources based on the 2018 AASHTO Green Book.
6.1 Introduction	Added bicycle facilities to the list of what an intersection includes. Added content outlining Safe System design strategies.  Intersection Design Impacts: Retitled "Intersection Users" to "Intersection Design Impacts". Updated key elements affecting intersection performance for pedestrians. Added subsection "Adjacent Land Uses"  Intersection Design Process: Added introductory text outlining the design process and performance-based design.
6.2 Definitions and Key Elements	Updated Figure 6-1 (former Exhibit 6-1) to include a corner truck apron. Updated descriptions of turning roadway and traffic control devices.

SECTION	CHANGE
6.3 User Characteristics	<p>Pedestrians: Updated introductory text.  Added reference to PROWAG in relation to crossings and pedestrian curb ramp locations.  Added reference to Chapter 3 for pedestrian walking speed.  Added reference to exclusive pedestrian phases in relation to traffic control, yielding, and delay.</p> <p>Bicyclists: Updated introductory text.  Added three considerations: user types, operating width, and bicycle length  Updated operating speed to design speed and updated description.  Added reference to MassDOT's Separated Bike Lane Planning &amp; Design Guide.</p> <p>Motor Vehicles: Updated introductory text. Updated definitions of design and control vehicle.  Added vehicle characteristics subsection and Table 6-1, and added sample vehicle turning dimensions to cover more design and control vehicles.  Added guidance on selecting design and control vehicles. Reorganized Table 6-2 (former Exhibit 6-2) by intersection approach combinations focused on lane configuration and width instead of functional classification.</p> <p>Transit: Added text describing preferred transit stop locations.  Added reference to Regional Transit Authorities and the MBTA Bus Stop Planning and Design Guide.</p>
6.4 Intersection Types and Configurations	<p>Updated Figure 6-17: Intersection Types (former Exhibit 6-4).</p> <p>Flared Intersections: Updated language to include information on auxiliary through lanes, offset and curb radius, and impacts to pedestrians and bicyclists.</p> <p>Channelized Intersections: Updated language to include information on impacts to pedestrians and cyclists, PROWAG requirements, and multiple stage crossings.</p> <p>Roundabouts: Updated introductory text and definition.  Added reference to MassDOT Guidelines for the Planning and Design of Roundabouts.  Removed information about differences from "rotaries."</p> <p>Typical Intersection Configurations: Updated introductory text.</p> <p>Indirect Intersection Configurations: Added section describing indirect intersection configurations and alternative intersections.</p>
6.5 Intersection Control	<p>Retitled "Traffic Control" to "Intersection Control".  Removed sub-section "Traffic Control Measures" and accompanying content.  Added reference to Intersection Control Evaluation (ICE) Procedure.</p>

SECTION	CHANGE
6.6 Intersection Performance Measures	<p>Retitled "Intersection Capacity and Quality of Service" to "Intersection Performance Measures". Updated and reduced introductory language.</p> <p>Safety Performance: Added subsection with content related to the Safe System approach, the calculation of future crashes, and Crash Modification Factors. Added references to the Highway Safety Manual and MassDOT Safety Alternatives Analysis Guide.</p> <p>Operational Performance: Added sub-section with content related to operational performance, quality of service, level of service, additional metrics for urban streets, pedestrian level of service, and bicycle level of service. Added definition of capacity from Highway Capacity Manual. Relocated content from "Motor Vehicle Capacity" subsection and streamlined information. Removed information about "critical lane volume" capacity and "pedestrian flow capacity" and "bicycle flow capacity" subsections. Added subsection for "Operational Assessment Techniques" describing HCM planning and operational assessment methodologies and introducing the example provided in Figure 6-19 and Figure 6-20 (former Exhibit 6-6). Removed Exhibit 6-7: Traffic Flow Related to Critical Lane Volumes. Removed subsection for "Multimodal Capacity".</p> <p>Level of Service (LOS): Removed section and related exhibits, including subsections "Pedestrian Level of Service", "Bicycle Level of Service", "Motor Vehicle Level of Service (LOS)", "Improving Vehicular Level of Service at Intersections", and "Multimodal Level of Service". Removed Exhibit 6-8: Pedestrian Level of Service (LOS) Criteria at Intersections. Removed Exhibit 6-9: Bicycle Level of Service (LOS) Criteria at Signalized Intersections. Removed Exhibit 6-10: Motor Vehicular Level of Service (LOS) Criteria at Intersections. Removed Exhibit 6-11: Common Intersection Level-of-Service Ranges by User Group and Area Type.</p>

SECTION	CHANGE
6.7 Geometric Design Elements	<p>Intersection Alignment: Cropped Figure 6-6 to focus on angle of intersection and to remove associated table (former Exhibit 6-12).  Added references to PROWAG requirements.  Removed Exhibit 6-13: Vertical Alignment Guidelines.</p> <p>Pavement Corner Radius: Added information regarding the relationship between corner radii and the design vehicles and control vehicles.  Added "Encroachment" subsection. Replaced Exhibit 6-15 with Figure 6-23: Intersection Maneuvers and Encroachment Scenarios  Updated descriptions of factors controlling pavement corner design at simple intersections.  Retitled Exhibit 6-16: Methods for Pavement Corner Design as Figure 6-24.  Replaced Exhibit 6-17 with Figure 6-25: Effective Corner Radius  Removed Exhibit 6-18: Simple Radius for Corner Design (Feet).  Removed Exhibit 6-19: Curve and Taper Corner Design as it duplicated Figure 6-24 (former Exhibit 6-16), but retained Table 6-3: Curve and Taper Corner Design Elements. In Table 6-3, replaced WB-50 values with WB-62 values.  Removed Exhibit 6-20: Turning Roadways and Islands.  Added "Corner Truck Aprons" subsection and added Figure 6-26: Mountable Truck Apron..</p> <p>Auxiliary Lanes: Retitled subsection "Left-Turn Lane Design Elements" to "Left-Turn and Right-Turn Lane Design Elements".  Added information about the trade-offs of right-turn lanes for people walking and biking.  Updated information about left-turn lane length.  Added Figure 6-27: Components of a Deceleration Lane.  Added Table 6-4: Desirable Lane Change and Deceleration Distance by Speed.  Added Table 6-5: Calculate Storage Length by Left-Turn Volume and Opposing Volume.  Added information on taper length and criteria for considering installation of left-turn lanes.  Removed Exhibit 6-21: Left-Turn Lane Design Guidelines.  Removed "Right-Turn Lane Design Elements" subsection and Exhibit 6-22: Right Turn Lane Design Guidelines.  Added Figure 6-28, Figure 6-29, and Figure 6-30, which contain criteria for left turn lanes in urban, rural two-lane, and rural four-lane conditions.  Removed "General Criteria for Right-Turn and Left-Turn Lanes" subsection, Exhibit 6-23, and Exhibit 6-24.  Separated Figure 6-31: Auxiliary Through Lane Design Guidelines from Table 6-6: Auxiliary Through Lane Design Guidelines (former Exhibit 6-25).</p>

SECTION	CHANGE
6.7 Geometric Design Elements (cont.)	<p>Channelization Islands: Updated requirements, minimum surface area, and length.  Added Figure 6-32: Channelization Islands (updated part of former Exhibit 6-26).  Added Figure 6-33: Impact of Island Shape on Speed and Visibility.  Added reference to NCHRP Research Report 834.  Added Figure 6-34: Minimum Design Detail of Channelized Islands (updated part of former Exhibit 6-26).  Added Figure 6-35: Alignment of Divisional Islands at Intersections.</p> <p>Intersection Median Openings: Removed reference to functional class in relation to medians.  Removed "Median and Design Controls" subsection.  Updated median opening guidance.  Separated Figure 6-36: Median Openings from Table 6-7: Median Openings Dimensions (Feet) (former Exhibit 6-29).  Updated Table 6-7: Median Openings Dimensions (Feet) based on 2018 AASHTO Green Book.</p> <p>Roundabout Geometric Design Elements: Removed section and referenced MassDOT's Guidelines for the Planning and Design of Roundabouts.  Removed Exhibit 6-27: Circle Dimensions, Single Lane Roundabout.</p> <p>Pedestrian Crossings: Retitled "Pedestrian Crosswalks" to "Pedestrian Crossings".  Updated guidance for marking pedestrian crossings, reducing pedestrian crossing distances, and pedestrian refuge islands.  Added "Locating Pedestrian Push Buttons" and "Reduced Corner Radii" subsections.  Removed Exhibit 6-30: Crosswalk Elements.  Updated "Pedestrian Crossing Prohibitions" subsection to include PROWAG requirements.</p> <p>Pedestrian Curb Ramps: Retitled from "Pedestrian Curb Cut Ramps" to "Pedestrian Curb Ramps".  Added reference to MassDOT Construction Standard Details and E-12-005.  Removed reference to diagonal ramps and updated requirements for perpendicular, parallel, and apex ramps.  Removed "Design Elements" subsection.</p> <p>Bicycle Lanes at Intersections: Removed section content and referenced to MassDOT's Separated Bike Lane Planning and Design Guide.  Removed Exhibit 6-31: Bicycle Accommodation at a Simple Intersection.  Removed Exhibit 6-32: Bicycle Accommodation at a Flared Intersection.  Removed Exhibit 6-33: Bicycle Accommodation at Roundabouts.</p>

SECTION	CHANGE
6.8 Other Considerations	<p>Intersection Spacing: Separated Figure 6-37: Intersection Spacing Diagram from Table 6-8: Intersection Spacing Guidelines (former Exhibit 6-34). Updated signalized intersection spacing guidelines. Added "Spacing between Roundabouts" subsection.</p> <p>Transit Stop Considerations: Updated information about bus stop locations and added reference to PROWAG requirements. Updated descriptions of challenges for users and design strategies for addressing challenges.</p> <p>Mid-Block Path Crossings: Updated information on median island requirements based on PROWAG. Added reference to FHWA's Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations.</p> <p>Railroad-Highway Grade Crossings: Added reference to PROWAG.</p> <p>Traffic Diversion Measures: Moved content from about traffic diversion measures for volume management from Chapter 16 to to this section.</p>
6.9 For Further Information	Updated references and links.