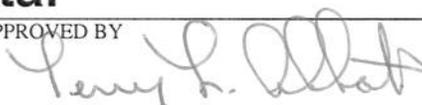


manual change transmittal

		NO.
TITLE DIVISION OF DESIGN HIGHWAY DESIGN MANUAL SIXTH EDITION – CHANGE 05/07/12	APPROVED BY  TERRY L. ABBOTT, Chief	Date Issued: 05/07/12
		Page 1 of 1
SUBJECT AREA ENTIRE MANUAL	ISSUING UNIT DIVISION OF DESIGN	
SUPERCEDES SEE BELOW FOR SPECIFICS ON CHANGES PROPOSED TO THE SIXTH EDITION	DISTRIBUTION ALL HOLDERS OF THE 6TH EDITION, HIGHWAY DESIGN MANUAL	

The California Department of Transportation (Caltrans) develops integrated multimodal projects in balance with community goals, plans, and values. The Sixth Edition, Highway Design Manual (HDM) was updated to implement Departmental Deputy Directive 64-R-1, which addresses complete streets¹ and integrating the transportation system for all users. Caltrans provides for the needs of travelers of all ages and abilities in all planning, programming, design, construction, operations, and maintenance activities and products on the State highway system. Caltrans views all transportation improvements as opportunities to improve safety, access, and mobility for all travelers in California and recognizes bicycle, pedestrian, and transit modes as integral elements of the transportation system. In addition, this HDM change updates Caltrans terminology, falsework standards, truck turning guidance, and pavement design procedures. These changes are described in the summary below with change-sheets available on the Caltrans Design website at:

<http://www.dot.ca.gov/hq/oppd/hdm/hdmtoc.htm>.

The most up to date version of the HDM is always available on the Caltrans Design website. Should a HDM holder choose to maintain a paper copy, the holder is responsible for keeping their paper copy up to date and current. Using the latest version available on-line will ensure proper reference to the latest design standards and guidance. If you would like to be notified automatically of any significant changes or updates to the HDM, go to the Caltrans website at:

<http://www.dot.ca.gov/hq/oppd/hdm/hdmlist.htm>.

Implementation

The HDM changes are effective May 7, 2012. The changes shall be applied to on-going projects in accordance with HDM Index 82.5 - Effective Date for Implementing Revisions to Design Standards; with the exception that through December 31, 2012, the Regional/District Deputy Director of Design is delegated the authority to make the final determination on whether to apply these new design standards or continue to use the previous design standards on a project-by-project basis for all projects where the PS&E has not yet been finalized. If the decision is not to apply the new design standards, the decision shall be documented in the project files and address the significant delay in the project schedule and/or the significant increase in the project engineering or construction costs.

¹ Complete Street: A transportation facility that is planned, designed, operated, and maintained to provide safe mobility for all users, including bicyclists, pedestrians, transit riders, and motorists appropriate to the function and context of the facility.

A summary of the most significant revisions are as follows:

<u>Foreword</u>	Edited to clarify the purpose of the manual and updated the discussion of Caltrans policy on the use of the U.S. Customary (English) and Metric units.
<u>Chapter 10</u>	Division of Design Index 11.1 and Figure 11.1 have been edited to be consistent with the current Division of Design organization structure.
<u>Chapter 20</u>	Designation of Highway Routes General update of current Interstate and defense highways, State sign routes, and business routes information.
<u>Chapter 40</u>	Federal-Aid Updated to be consistent with current federal legislation and with the current California Stewardship & Oversight Agreement with FHWA.
<u>Chapter 60</u>	Nomenclature Topic 61 – Abbreviations Updated and re-alphabetized the list of abbreviations. Topic 62 – Definitions Updated, reorganized, enhanced, and clarified the definitions to be consistent with the changes published in the manual.
<u>Chapter 80</u>	Application of Design Standards Index 81.1 – Philosophy Clarified and enhanced the existing text. Index 81.2 – Highway Context New guidance provided that discusses designing a highway that is sensitive to, and respectful of, the surrounding context. Index 81.3 – Place Types New guidance provided that discusses “place types” - the physical environment and land uses that surround the State highway. Index 81.4 – Type of Highway New discussion has been provided in this portion of the manual to connect highway type terminology to highway context and place types. Index 81.5 – Access Control New discussion provided to connect access control to highway context, place types, etc. Index 81.6 – Design Standards and Highway Context New discussion provided to communicate that designers have the ability to design for all modes of travel (vehicular, bicycle, pedestrian and transit); and also to tailor a project to the unique circumstances that relate to it and its location. Index 82.1(4) – Permissive Standards Edited text to clarify. Index 82.2(1) – Mandatory Standards Edited text to be consistent with current federal legislation and with the current California Stewardship & Oversight Agreement with FHWA.

Tables 81.2 A & B: Mandatory and Advisory Standards

These tables were updated to be consistent with the changes throughout the manual. Commenting on this is not necessary. These tables will be updated similar to the Table of Contents, List of Figures, List of Tables, and Index as mentioned above.

Table 81.2C – Decision Requiring Other Approvals

New table was provided to indicate locations in the manual where decisions requiring other approvals are required.

Chapter 100

Basic Design Policies

Topic 101 – Design Speed

Edited text to provide clarity.

Topic 102 – Highway Capacity

Edited text to provide clarity.

Topic 103 – Design Designation; 103.1 – Relation to Design

Climate region added.

Topic 104 – Control of Access; 104.3 – Frontage Roads

Clarified text that discussed bicyclists and pedestrians.

Topic 105 – Pedestrian Facilities

Changed the advisory standard minimum width of sidewalk to 8 feet between curb and a building when in urban and rural main street place types. For all other locations the minimum width of sidewalk should be 6 feet when contiguous to a curb or 5 feet when separated by a planting strip.

Topic 108 – Coordination with Others; 108.2 – Transit Loading Facilities

Added new text and changed terminology from bus to transit.

Topic 108 – Coordination with Others; 108.3 – Commuter and Light Rail Facilities Within State Right of Way

Modified text to focus on commuter and light rail facilities.

Topic 108 – Coordination with Others; 108.4 – Bus Rapid Transit

Edited text to be consistent with changes in Index 108.3.

Topic 108 – Coordination with Others; 108.5 – Coordination with FHWA

Renumbered existing Index 108.4 and edited text to be consistent with changes in Chapter 40.

Topic 110.7 – Traffic Control Plans

Edited text to assure adequate consideration for all users and travel modes.

Topic 110.8 – Safety Reviews

Edited text to assure adequate consideration for all users and travel modes.

Topic 115 – Designing for Bicycle Traffic

New information has been added on this subject.

Topic 116 – Bicyclists and Pedestrians on Freeways

New information has been added on this subject.

Chapter 200

Geometric Design and Structure Standards

The design guidance that addressed the mobility needs of bicyclists related to Class II bikeways (bike lanes) was distributed into this chapter where it was appropriate. In addition, the text was clarified and updated. Plus, the following specific changes have been made:

Figure 202.2 – Maximum Comfortable Speed on Horizontal Curves

Figure was corrected to better represent the maximum comfort speeds that would be obtained from the equation provided with the figure.

Index 204.5 (4) – Sustained Grades; Turnouts

Added guidance that where less than 4' shoulders are provided, consideration should be given to providing bicycle turnouts equal to a standard shoulder width as often as possible.

Table 204.8 – Falsework Span and Depth Requirements

Table has been completely updated.

Index 205.4 – Driveways on Frontage Roads and in Rural Areas

Unpaved driveway crossings of bike paths and pedestrian walkways or driveway intersections with roadways or pedestrian paths are to be paved for a minimum of 15 feet.

Topic 210 – Reinforced Earth Slopes and Earth Retaining Systems

Design guidance has been updated.

Chapter 300

Geometric Cross Section

The design guidance that addressed the mobility needs of bicyclists related to Class II bikeways (bike lanes) was distributed into this chapter where it was appropriate. The text was also clarified and updated. In addition, the following specific changes have been made:

Index 301.1 – Lane Width

The minimum lane width on two-lane and multilane highways, ramps, collector roads, and other appurtenant roadways has been modified to be 12 feet; however 11 feet is allowed under certain circumstances and conditions.

Index 302.1 – Shoulder Width

Shoulder width guidance has been revised including rumble strip guidance, Table 302.1, and Figure 301.2A.

Topic 303 – Curbs, Dikes, and Side Gutters; 303.1 General Policy

The speed environment related to using these curb types has changed from an operating speed to posted speed.

Topic 303 – Curbs, Dikes, and Side Gutters; (1) Types A1-6, A2-6, and A3-6.

The speed environment related to using these curb types has changed from an operating speed of 40 miles per hour to a posted speed of less than 35 miles per hour.

Topic 303 – Curbs, Dikes, and Side Gutters; (5) Type D Curb.

The speed environment related to using these curb types has changed from an operating speed equal or exceeding 50 miles per hour to a posted speed equal or exceeding 45 miles per hour.

Index 303.4 – Curb Extensions

New discussion and information has been provided related to curb extensions, bulbouts.

Topic 305 – Median Standards; Index 305.1(2) Conventional Highways

New discussion and information on raised medians at pedestrian crosswalks and bicycle path crossings has been provided.

Index 307.2 – Two-lane Cross Sections for New Construction

Mandatory minimum paved width of each shoulder has been increased from 2 feet to 4 feet.

Index 309.5 – Structures Across or Adjacent to Railroads

Guidance has been updated.

Topic 310 – Frontage Roads; Index 310.1 Cross Section

The minimum paved 2-lane cross section widths have been changed based upon whether 12-foot or 11-foot lanes are used and if 4-foot or 5-foot shoulders are present.

Chapter 400

Intersections at Grade

The design guidance that addressed the mobility needs of bicyclists related to Class II bikeways (bike lanes) was distributed into this chapter where it was appropriate. The text was also clarified and updated. In addition, the following specific changes have been made:

Topic 401 – Factors Affecting Design

New discussion and information has been provided.

Topic 403 – Principles of Channelization

New discussion and information has been provided related to pedestrians and bicyclists.

Topic 404 – Design Vehicles

Design guidance has been updated.

Index 405.2(2)(a) – Left-turn Channelization; Design Elements, Lane Width

11-foot lane width, for both single and double left-turn lanes on State highways, is acceptable with posted speeds less than 40 mph and where large trucks are not expected.

Index 405.4 – Traffic Islands

Design guidance has been updated including pedestrian refuge.

Chapter 500

Traffic Interchanges

The design guidance that addressed the mobility needs of bicyclists related to Class II bikeways (bike lanes) was distributed into this chapter where it was appropriate. The text was also clarified and updated. In addition, the following specific changes have been made:

Index 501.3 – Spacing

Per Federal guidelines, 3-mile minimum interchange spacing on rural Interstates has been added as a mandatory design standard.

Index 502.2 – Local Street Interchanges

The use of isolated off-ramps has been changed from an advisory design standard to a mandatory design standard.

Index 502.2(f) – Other Types of Interchanges

Requirement created to have new or experimental interchanges have the Design Coordinator and Traffic Liaison’s concurrence before selection.

Index 502.3 – Freeway-to-freeway Interchanges

Per Federal guidelines, all interchanges need to provide for each of the eight basic movements (or four basic movements in the case of a three-legged interchange), except in the most extreme circumstances. Less than “full interchanges” may be considered on a case-by-case basis for applications requiring special access for managed lanes (e.g., transit, HOVs, HOT lanes) or park and ride facilities.

Topic 503 – Interchange Design Procedure; Index 503.1 - Basic Data

Review procedures and data needed have been updated. The approval of geometric features of all interchanges or modifications to existing interchanges by the Design Coordinator has been changed to a procedural requirement.

Index 504.2(1) – Freeway Entrances and Exits; Basic Policy

Express lanes and Bus Rapid Transit (BRT) lanes have been added to the mandatory design standard mandating connections to the right of through traffic.

Index 504.3(7) – Ramps; Two-lane Entrance Ramps

Guidance on these facilities has been eliminated in favor of requiring that whenever these types of entrance ramps are being considered, they be discussed early on with the HQ Traffic Liaison and Design Coordinator or Design Reviewer.

Index 504.7 – Weaving Sections

Design guidance has been updated.

**Chapters 600
to 670**

Pavement Engineering

Titles and topic matter, as needed, related to the Pavement Management Program and Office of Pavement Engineering were updated in the text. Term structural section has been replaced with pavement structure. Rigid pavement joint terminology updated. In addition, the following specific changes have been made:

Topic 603 – Types of Pavement Projects

Guidance updated related to pavement preservation, roadway rehabilitation, and reconstruction. Text has also been updated to provide clarity.

Table 613.3B – Lane Distribution Factors for Multilane Highways

Notes have been revised.

Table 613.5A – Traffic Index (TI) Values for Ramps and Connectors

Ten-year design life deleted.

Index 613.5 – Specific Traffic Loading Considerations

Text related to the future conversion of a shoulder to a traffic lane and intersections have been updated.

Topic 619 – Life-Cycle Cost Analysis

Text updated to reflect new 20- and 40-year design periods being used.

Topic 620 – Rigid Pavement

Rigid Pavement Catalog tables have been updated.

Chapter 700

Miscellaneous Standards

Topic 707 – Slope Treatment Under Structures

Clarified guidance related to reducing mud or debris from encroaching upon the traveled way for motorists, bicyclists, and pedestrians.

Chapter 800

Highway Drainage Design – General Aspects

Index 801.4 – Objectives of Drainage Design

Clarified text.

Index 803.1 – Basic Policy

Clarified text.

Index 803.3(2) – Proposed Upstream Development

Clarified text.

Chapter 830

Transportation Facility Drainage

Chapter title changed.

Index 830.1 – Basic Concepts

Reworded text to provide clarity by using broader terminology.

Index 831.3 – Design Storm and Water Spread

Reworded text to clarify drainage needs at bus/transit stops.

Index 837.2(2) – Inlet Types; Grates

Reworded text for clarity.

Figure 837.1 – Storm Drain Inlet Types

Added Note 5 for clarity.

Index 837.3 – Location and Spacing

Reworded text for clarity.

Chapter 860

Open Channels

Index 861.1 – Introduction

Clarified guidance applies to all transportation facilities and travelers.

Index 861.2 – Hydraulic Considerations

Clarified guidance applies to all transportation facilities and travelers.

Index 861.4 – Safety Considerations

Clarified guidance applies to all transportation facilities and travelers.

Chapter 870

Channel and Shore Protection – Erosion Control

Index 871.1 – Introduction

Clarified guidance that applies to all transportation facilities.

Index 871.2 – Design Philosophy

Clarified guidance that applies to all transportation facilities.

Chapter 900

Landscape Architecture

Index 902.2(1) – Sight Distance Setbacks

Clarified that sight distance requirements applied to all modes of travel.

Index 902.2(2) – Clear Recovery Zone

Added reference to Bike Path guidance related to this subject in Chapter 1000.

Index 902.3(3) – Plant Location

Clarified guidance in relationship to bicyclists and pedestrians.

Index 902.4 – Irrigation Guidelines

Added guidance to avoid the spraying of sidewalks and bikeways.

Index 903.4(4) – Automobile/Long Vehicle Split

Updated terminology used in text.

Index 903.4(5) – Bicycle Parking

Reworded text in title for clarity.

Index 903.5(4) – Parking Areas

Updated terminology used in text.

Index 903.5(6) – Signage

Added reference to DIB 82.

Index 903.5(7) – Walkways

Updated terminology in text and added a minimum clearance of 8 feet from pavement to the lower foliage that is to be provided adjacent to walkways.

Index 903.6(4) – Telephones

Updated terminology used in text.

Index 903.7(1) – Restrooms

Updated terminology used in text.

Index 903.8 – Security and Pedestrian Amenities

Updated terminology used in text.

Index 904.1 – General

Added reference to DIB 82.

Topic 904.3 – Design Features and Facilities

Updated terminology and added reference to DIB 82.

Topic 905 – Park and Ride Standards and Guidelines

Updated terminology and added reference to DIB 82.

Chapter 1000

Bicycle Transportation Design

The design guidance that addressed the mobility needs of bicyclists related to Class II bikeways (bike lanes) was distributed throughout the manual where it was appropriate. The topics and figures remaining in the chapter were reorganized, updated, and enhanced. New mandatory and advisory standards associated with bicycle transportation have been created. New guidance has been written for topics such as: entry control for bicycle paths; sharing of bus and bicycle lanes; and trails.