Roadway Design Manual

Texas Department of Transportation

Manual Notice Archive

© by Texas Department of Transportation
(512) 302-2453 all rights reserved

Manual Notice 2013-1

From: Mark A. Marek, P.E

Manual: *Roadway Design Manual*

Effective Date: December 11, 2013

Purpose

This revision is intended to update the *Roadway Design Manual*, specifically Chapter 2, Basic Design Criteria, based on 2011 American Association of State Highway and Transportation Officials (AASHTO) *Geometric Design of Highways and Streets* revisions.

Contents

The following changes have been made:

Chapter 1, Preface

- Added non-discrimination statement.

Chapter 1, Section 2, Design Exceptions, Design Waivers and Design Variances

- Subsection "New Location and Reconstruction Projects (4R)" - Added "Lateral offset to Obstructions" to list of controlling criteria that require a design exception.

Chapter 2, Basic Design Criteria

- General renumbering of Tables and Figures throughout the chapter,
- Updated English and Metric tables to current AASHTO values, and
- Metric Versions are no longer shown but may be viewed in PDF format by accessing link.

Chapter 2, Section 3, Sight Distance

- Subsection "Decision Sight Distance" - paragraph added at the end of subsection regarding a reduced decision zone,
- Subsection "Passing Sight Distance" - added reference to Super 2 Highways for further discussion, and
- Subsection "Intersection Sight Distance" - the second bullet describing the types of intersection controls has been rewritten.

Chapter 2, Section 4, Horizontal Alignment. This section has been completely reorganized for better flow and revisions are as follows:

- Table 2-3, "Horizontal Curvature of High-Speed Highways and Connecting Roadways with Superelevation", updated to current AASHTO values.
- Table 2-4, "Horizontal Curvature of Highways without Superelevation", updated to current AASHTO values. Values for 6% superelevation were added to table.
- Table 2-5, "Minimum Radii and Superelevation for Low-Speed Urban Streets", updated to current AASHTO values.
- Table 2-6, "Minimum Radii for Design Superelevation Rates, Design Speeds", and e_{max} = 6%, updated to current AASHTO values.
- Table 2-7, "Minimum Radii for Design Superelevation Rates", Design Speeds, and e_{max} = 8%, updated to current AASHTO values.
- Subsection "Superelevation Transition Length" - The first two paragraphs and Table 2-8 were relocated from the discussion on Superelevation in the current version of the manual. The last paragraph of this subsection and Table 2-9 "Multilane Adjustment Factor" were added.
- Subsection "Superelevation Transition Placement" -This is a new section and provides updated guidance on placement of the transition, and Table 2-10, "Portion of Superelevation Transition Located on the Tangent", where were added from the current AASHTO "Green Book".
- Subsection "Superelevation Transition Type" - This section is new and references the AASHTO "Green Book" for additional methods.
- Subsection "Sight Distance on Horizontal Curves" - The last paragraph in the section was added regarding methods to mitigate barrier obstructions.

Chapter 2, Section 5, Vertical Alignment

- Subsection "Crest Vertical Curves" - A sentence was added to the 3rd paragraph regarding successive vertical curves.
- Subsection "Combination of Vertical and Horizontal Alignment" - The last bullet was modified to include reference to Super 2 Highways.

Chapter 2, Section 6, Cross Sectional Elements

- The term "horizontal clearance" was replaced with "clear zone" throughout this section.
- Updated this section to current Americans with Disabilities Act Public Accessibility Guideline for Pedestrian Facilities in the Public Right of Way (PROWAG) and Texas Accessibility Standards (TAS).
- Subsection "Overview"
  - Added "Lateral Offset to Obstructions".
  - Changed "Horizontal Clearances to Obstructions" to "Clear Zone".
  - Moved "Slopes and Ditches" section down after "Roadside Design".

- Subsection "Pavement Cross Slope" - The last paragraph was modified to delete reference to design exception.
- Subsection "Lane Widths" - Added last paragraph discussing Bicycle Accommodations.
- Subsection "Shoulder Widths" - Added 2nd paragraph regarding bicycle accommodations and offset to barriers.
- Subsection "Sidewalks and Pedestrian Elements "- 1st paragraph was modified and factors when sidewalks should be included were added.
- Subsection "Sidewalk Location" - The buffer space between back of curb and sidewalk was modified. Additional discussion was added at the end of paragraph.
- Subsection "Sidewalk Width" - minor wording modifications to the two paragraphs.
- Subsection "Street Crossing" - Dimensions for refuge islands and cut throughs were modified. Last line of paragraph was added.
- Subsection "Curb Ramps and Landings" - modified 1st bullet to include reconstruction and rehabilitation. Added preferred width of curb ramps.
- Subsection "Cross Slope" - added sentence to end of paragraph regarding the running slope of sidewalks across driveways.
- Subsection "Street Furniture" - added a sentence to last paragraph discussing pedestrian push buttons.
- Subsection "Slopes and Ditches" - relocated discussion. Deleted Table 2-10.
- Subsection "Lateral Offset to Obstruction" - New section added.
- Subsection "Clear Zone" - Changed section title from "Horizontal Clearances to Obstructions" to "Clear Zone" and discussion on definition.
- Table 2-12 - The clear zone width changed from 1.5 ft to 4 ft minimum, and 3 ft to 6 ft desirable for "Urban, curbed, < 45 mph".

Chapter 2, Section 7, Drainage Facility Placement

- The term "horizontal clearance" was replaced with "clear zone" throughout this section.
- Subsection "Overview" - added "Side Ditches".
- Subsection "Design Treatment of Cross Drainage Culvert Ends" - Bullets removed from first paragraph. Discussed in subsequent sections.
- Subsection "Small Pipe Culverts" - combined paragraphs 3 and 4.
- Subsection "Intermediate Size Single Box Culverts and (Single and Multiple) Pipe Culverts" - 2nd recommended safety treatment option not applicable to bridge class culverts.
- Subsection "Multiple Box Culverts and Large single Pipes or Boxes": - 2nd recommended safety treatment option not applicable to bridge class culverts.

- Subsection "Bridge Class Drainage Culverts" - added recommended treatment options to 2nd paragraph. Modified Table 2-14 and its title.
- Figure 2-10, "Use of Guardrail at Bridge Class Culverts", depth of cover changed to ">9" to < 36".
- Figure 2-11, "Use of Sloping Pipe Ends Without Cross Pipes", replaced the term Grates with Cross Pipes.
- Figure 2-12, "Use of Sloping Pipe Ends with Cross Pipes", replaced the term Grates with Cross Pipes.
- Subsection "Side Ditches" - added wording in the last paragraph regarding rock filter dam.

Instructions

This revision will be distributed online only.

This manual, and all revisions, applies to all highway and street project development, whether developed by the department or with consultant staff. Due to projects that may be further along in development with current superelevation criteria, this manual, and all revisions, will be effective for all projects beginning with the December 2014 letting. Project development using this manual and its revisions prior to that date is at the option of the district.

Contact

For general comments and suggestions for future revisions of this manual, contact the Design Division, Roadway Design Section.

Copyright Notice

This *Roadway Design Manual* and all future revisions:

Copyright ©2013 by Texas Department of Transportation

Published by the Design Division

All rights reserved.

Archives

Past manual notices are available in a pdf archive.

Manual Notice 2010-1

From: Mark A. Marek, P.E

Manual: Roadway Design Manual

Effective Date: May 01, 2010

Purpose

This revision is intended to update the Roadway Design Manual and, specifically, Chapter 1, Section 2; Chapter 4, Section 6; and Chapter 5, Section 1.

Contents

The following changes have been made:

- Chapter 1, Section 2. This section has been revised to delegate roadway design exception approval procedures to the district level.
- Chapter 4, Section 6. This section has been completely revised to expand the guidance on the use of Super 2 highways.
- Chapter 5, Section 1. This section has been revised to extend the application of 2R guidelines to roadways not on the National Highway System (NHS) with an ADT of 2500 per lane or less.

Instructions

This revision will be distributed online only.

This manual, and all revisions, applies to all highway and street project development, whether developed by the department or with consultant staff. This manual, and all revisions, will be effective for all projects beginning with the August 2010 letting. Project development using this manual and its revisions prior to that date is at the option of the district.

Contact

For general comments and suggestions for future revisions of this manual, contact the Design Division, Roadway Design Section.

Copyright Notice

This *Roadway Design Manual* and all future revisions:

Copyright ©2010 by Texas Department of Transportation

Published by the Design Division

All rights reserved.

Archives

Past manual notices are available in a pdf archive.

Manual Notice 2009-1

From: Mark A. Marek, P.E

Manual: Roadway Design Manual

Effective Date: March 01, 2009

Purpose

This revision is intended to update the *Roadway Design Manual*, specifically to include TxDOT's Nondiscrimination Policy.

Contact

Address questions concerning the information contained in this manual to the Roadway Design Section in the Design Division.

Copyright Notice

This *Roadway Design Manual* and all future revisions: Copyright ©2009 by the Texas Department of Transportation (TxDOT). Published by the Design Division (DES). All rights reserved.

Archives

Past manual notices are available in a pdf archive.

Manual Notice 2006-2

From: Mark A. Marek, P.E

Manual: Roadway Design Manual

Effective Date: October 01, 2006

Purpose

This revision is intended to update the Roadway Design Manual and, specifically, add a new Chapter 8, Mobility Corridor (5R) Design Criteria.

Contents

Chapter 8, Mobility Corridor (5 R) Design Criteria, is being added to the Roadway Design Manual to provide geometric design criteria for design speeds of 85 mph to 100 mph. Since higher allowable operating speeds are possible in the future, higher design speeds should be considered when planning new facilities or reconstructing existing applicable corridors. While a higher operating speed may not be safe or appropriate in all instances (such as densely developed urban areas), higher design speeds should be considered whenever prudent.

With respect to facilities that one day could be part of the Trans-Texas Corridor (TTC), particularly new location routes, it is strongly recommended that these facilities be initially designed to accommodate a 100 mph design speed. Even though the facility may initially be posted for an 85 mph speed, the higher design criteria will allow the greatest flexibility, both in the roadway portion as well as for other transportation modes within the right of way, in terms of maximizing the future use of the corridor.

This does not mean that all projects should be over-designed. If, through the project development process it is determined that substantial, adverse and unavoidable social, economic and environmental impacts will occur, then different design criteria may be appropriate. Contact the Environmental Affairs Division and the Right of Way Division as questions arise about environmental and right of way impacts while planning for higher design speeds.

Instructions

This revision will be distributed online only.

This manual, and all revisions, applies to all highway and street project development, whether developed by the department or with consultant staff. This manual, and all revisions, will be effective for all projects beginning with the April 2007 letting. Project development using this manual and its revisions prior to that date is at the option of the district.

Contact

For general comments and suggestions for future revisions of this manual, contact the Design Division, Roadway Design Section.

Archives

Past manual notices are available in a pdf archive.

Manual Notice 2006-1

To: Districts and Divisions

From: Mark A. Marek, P.E.

Subject: Manual Revision

Manual: *Roadway Design Manual*

Date: July 1, 2006

Purpose

This revision is intended to update the Roadway Design Manual and, specifically, add Section 6, Super 2 Highways, to Chapter 4.

Contents

The following addition has been made.

- Chapter 4, Section 6. This section has been added to give design guidance in developing passing opportunities on two lane roadways. This section discusses appropriate lengths and spacing of the passing lane sections, and the design criteria applicable for these roadways.

Instructions

This revision will be distributed online only.

This manual, and all revisions, applies to all highway and street project development, whether developed by the department or with consultant staff. This manual, and all revisions, will be effective for all projects beginning with the January 2007 letting. Project development using this manual and its revisions prior to that date is at the option of the district.

Contact

For general comments and suggestions for future revisions of this manual, contact the Design Division, Roadway Design Section.

Copyright Notice

This Roadway Design Manual and all future revisions:
Copyright ©2006 by Texas Department of Transportation (TxDOT).
Published by the Design Division (DES).
All rights reserved.

Manual Notice 2005-1

To: Districts and Divisions

From: Mark A. Marek, P.E.

Subject: Manual Revision

Manual: *Roadway Design Manual*

Date: October 1, 2005

Purpose

This revision is intended to update the Roadway Design Manual and, specifically, add Appendix C, Driveway Design Guidelines to be used in conjunction with the Access Management Manual and the Maintenance Division's Regulations for Access Driveways to State Highways.

Contents

The following addition has been made.

- Appendix C. This appendix as a whole has been added on areas related to Driveway Design. All revisions are contained in Appendix C. It includes sections discussing Driveway Design Principles, Profiles, Driveway Angle, Pedestrian Considerations, Visibility and References.

Instructions

This revision will be distributed online only.

This manual, and all revisions, applies to all highway and street project development, whether developed by the department or with consultant staff. This manual, and all revisions, will be effective for all projects beginning with the June 2006 letting. Project development using this manual and its revisions prior to that date is at the option of the district.

Contact

For general comments and suggestions for future revisions of this manual, contact the Design Division, Roadway Design Section.

Copyright Notice

This Roadway Design Manual and all future revisions:
Copyright ©2005 by Texas Department of Transportation (TxDOT)

Published by the Design Division (DES)
All rights reserved.

Manual Notice 2004-1

To: Districts and Divisions

From: Ken Bohuslav, P.E.

Subject: Manual Revision

Manual: *Roadway Design Manual*

Date: February 2, 2004

Purpose

This revision is intended to update the *Roadway Design Manual* and, specifically, update Chapter 3 on areas related to access management to compliment the recently released *Access Management Manual*.

Contents

The following updates and additions have been made.

- Chapter 3. This chapter as a whole has been updated on areas related to access management. All revisions are contained in Chapter 3. Some figures have been added that have resulted in the renumbering of all figures in this chapter.
- Figure 3-1: Types of Directional Openings. This figure was added.
- Figure 3-2: This figure was added.
- Section 2 Urban Streets, Subheading Speed Change Lanes. Significant changes have been made to this area of discussion:
  - The components of a speed change lane have been changed to include the taper as part of the deceleration length.
  - Left Turn Deceleration Lanes paragraph has been revised to show the geometric dimensions of single and dual left turn lanes.
  - Figure 3-3 illustrates single and dual left-turn deceleration lanes.
  - Tables 3-3 & 3-4, Lengths of Single & Dual Left-Turn Lanes. Deceleration, taper and storage lengths have been revised. Discussions on deceleration and storage lengths determinations have been added for further clarification.
  - Right-Turn Acceleration & Deceleration Lanes paragraphs have been added.
  - Figure 3-4 illustrates a right-turn deceleration lane.
- Section 2 Urban Streets, Subheading Auxiliary Lanes on Crest Vertical Curves. A discussion has been added concerning the location of auxiliary lanes in relation to crest vertical curves.
- Section 3 Suburban Roadways, Subheading Access Control. The last paragraph has been revised to reference the *Access Management Manual*.

- Section 3 Suburban Roadways, Subheading Median Openings. The median opening spacing has been removed and reference is made to Section 2, Urban Streets for median information. This change allows the design more flexibility in determining appropriate median opening locations.
- Section 3 Suburban Roadways, Subheading Speed Change Lanes. Reference is now made to Section 2, Urban Streets for speed change information.
- Section 4 Two-Lane Rural Highways, Subheading Speed Change Lanes.
  - Left-Turn Deceleration Lanes. The third paragraph has been added directing designers to the table in Section 5, Multi-Lane Rural Highways for left turn lanes lengths.
  - Right-Turn Deceleration Lanes. The third paragraph makes reference to a figure in Section 2, Urban Streets that illustrates a right turn lane. The fourth paragraph was added directing designers to the table in Section 5, Multi-Lane Rural Highways for right-turn lane lengths.
  - Right-Turn Acceleration Lanes. This discussion has been added to direct designers to a figure in Section 5, Multi-Lane Rural Highways for acceleration lengths.
- Section 5 Multi-Lane Rural Highways, Subheading Turn Lanes.
  - Table 3-13. The deceleration and taper lengths have been revised.
  - Right-Turn Deceleration Lane. Table 3-13 is referenced for right-turn lengths.
  - Acceleration Lanes. This discussion and Figure 3-10 have been added. (Note: This figure is the bottom portion of previous Figure 3-4 prior to these revisions.)
- Section 6 Freeways, Subheading Conversion of Frontage Roads from Two-Way to One-Way Operation. Guidance on the conversion of the frontage roads was previously sent out by memorandum and is now included in the manual.
- Section 6 Freeways, Subheading Horizontal Geometrics. Figure 3-36 was added. (Note: This figure was previous Figure 3-4 prior to these revisions.)

Instructions

This revision will be distributed online only.

This manual, and all revisions, applies to all highway and street project development, whether developed by the department or with consultant staff. This manual, and all revisions, will be effective for all projects beginning with the November 2004 letting. Project development using this manual and its revisions prior to that date is at the option of the district.

Contact

For general comments and suggestions for future revisions of this manual, contact the Design Division, Roadway Design Section.

Copyright Notice

This *Roadway Design Manual* and all future revisions:
Copyright ©2004 by Texas Department of Transportation (TxDOT)
Published by the Design Division (DES)
All rights reserved.

Manual Notice 2002-2

To: All Districts and Divisions

From: Ken Bohuslav, P.E.

Subject: Manual Revision

Manual: *Roadway Design Manual*

Effective Date: October 1, 2002

Purpose

This revision is intended to update the Roadway Design Manual. This revision will complete presentation of the Roadway Design Manual in dual units (US Customary and Metric).

Contents

The following updates and additions have been made.

- Chapter 3, Table 3-3, Table 3-4, Table 3-13 and Figure 3-4. The note in these tables and figure referring to "…moderate amount of deceleration…" has been changed to define "moderate" as 10 mph [15 km/h].
- Chapter 3, Table 3-13. The deceleration length was updated in accordance with the values shown in the 2001 Green Book. The minimum storage length was updated to correct a conversion error.
- Chapter 5, Section 1, First Paragraph. The application of the guidelines in this chapter has been updated. The current average daily traffic (ADT) has been changed from less than 1500 to 3000 and less to provide additional flexibility for 2R projects. These guidelines apply to projects which are not on the National Highway System (NHS) routes.
- Chapter 7 and Appendix A. This chapter and appendix have been converted to dual units to show both US Customary and Metric values, and, where appropriate, updated in accordance with the 2001 Edition of the AASHTO publication, "A Policy on Geometric Design of Highways and Streets" (Green Book).

Instructions

This revision will be distributed online only.

It should be recalled that Manual Notice 2001-2 allowed projects to be designed using the old or new stopping sight distance values through December 2003. Projects let in January 2004 or after must meet the new stopping sight distance criteria or have an approved design exception.

With that caveat, the balance of this manual, and all revisions, will be effective for all projects beginning with the July 2003 letting. This manual, and all revisions, applies to all highway and street project development, whether developed by the department or with consultant staff. Project development using this manual and its revisions prior to those dates are at the option of the district.

Contact

For general comments and suggestions for future revisions of this manual, contact the Design Division, Roadway Design Section.

Copyright Notice

This Roadway Design Manual and all revisions:
Copyright © 2002 by Texas Department of Transportation (TxDOT)
Published by the Design Division (DES)
All rights reserved.

Manual Notice 2002-1

To: All Districts and Divisions

From: Ken Bohuslav, P.E.

Subject: Manual Revision

Manual: *Roadway Design Manual*

Effective Date: April 1, 2002

Purpose

This revision is intended to update the Roadway Design Manual.

Contents

The following updates and additions have been made.

- Chapters 3, 4 and 6. These chapters have been converted to dual units to show both US Customary and Metric values, and, where appropriate, updated in accordance with the 2001 Edition of the AASHTO publication, "A Policy on Geometric Design of Highways and Streets" (Green Book).
- Chapter 2, Tables 2-6 and 2-7, Superelevation Rates from Horizontal Curves on High-Speed Highways. The previous editions of these tables were taken directly from the 2001 AASHTO Green Book. However, AASHTO chooses to reverse the crown in the superelevation tables beginning at a superelevation rate of 1.5 percent. Since TxDOT uses a normal cross slope of 2 percent, this put the AASHTO tables at a slight variation from the Roadway Design Manual, Table 2-4, Horizontal Curvature of Highways Without Superelevation. Table 2-4 is based on a normal crown of 2 percent. Tables 2-6 and 2-7 have been modified to retain the normal crown until a superelevation rate of 2 percent is reached to be compatible with Table 2-4. Though not necessary, reversing the crown at 1.5 percent would be acceptable.
- Chapter 2, Section 4, Horizontal Alignment, Subheading Superelevation. Near the end of this subhead section, the equations for L_{AP}, the transition length for appearance and profiles, are given. Both the US Customary and the Metric equation used the coefficient 2.93. The US Customary equation is correct. The Metric equation should be:
  $L_{AP} = 0.56\ V_D$ (Metric)
- Chapter 2, Figure 2-7, Design Controls for Crest Vertical Curves (US Customary).
  Chapter 2, Figure 2-8, Design Controls for Crest Vertical Curves (Metric).
  Chapter 2, Figure 2-9, Design Controls for Sag Vertical Curves (US Customary).
  NOTE: These three figures were incorrectly titled in the caption below the figure and showed the old figure titles. The correct figure title appeared inside the figure and should have matched the captioned title. The captioned title below the figure has been corrected.

- Chapter 2, Section 6, Cross Sectional Elements, Subheading Pavement Cross Slope. A sentence has been added to clarify that pavement cross slopes of less than 1 percent require design exception documentation.
- Chapter 2, Section 7, Drainage Facility Placement. Table 2-13, Use of Guardrail for Bridge Class Culverts, and Figure 2-15, Use of Guardrail on Bridge Class Culverts, have been updated to reflect the change in post depth of embedment dimensions needed with the recently revised guardrail standard details. The old details had a post embedment depth of 38 inches and the new details provide an embedment depth of 44 inches for new construction projects.
- Chapter 3, Section 2, Urban Streets, Subheading Medians.
  Chapter 3, Section 3, Suburban Streets, Subheading Medians.
  NOTE: Based on preliminary work in TxDOT research project 0-4141, "Development of Access Management Classifications and Guidelines," the threshold value for consideration of a raised median application has been established at 20,000 vehicles per day. The old value of 25,000 vehicles per day has been revised to reflect this new threshold value.
- Chapter 3, Table 3-5, Geometric Design Criteria for Suburban Roadways. The desirable and minimum offsets to face of curb has been revised to make these offsets consistent with those given for urban streets in Table 3-1.
- Chapter 3, Table 3-12, Design Criteria For Multilane Rural Highways,
  Chapter 3, Table 3-17, Design Speed for Controlled Access Facilities.
  NOTE: Previously, these two tables showed a desirable design speed. This desirable design speed was based on the maximum design speed offered in the AASHTO Green Book. Since the 2001 AASHTO Green Book has provided design speed ranges up to 80 mph [130 km/h] and these higher design speeds may not be desirable in all cases, the desirable design speed for these two tables has been eliminated. These tables now show minimum design speeds only.
- Chapter 3, Section 5, Multi-Lane Rural Highways, Subheading Converting Existing Two-Lane Roadways to Four-Lane Divided Facilities. This is a new subheading added after the subheading, "Transitions to Four-Lane Divided Highways". This new subheading explains the Federal Highway Administration's allowance for the existing roadway alignments to remain in place when a two-lane roadway is converted to a four-lane divided facility.
- Chapter 5, Non-Freeway Resurfacing or Restoration Projects (2R). This chapter has been revised to allow restoration (2R) guidelines to apply to non-freeway resurfacing or restoration projects that have current average daily traffic (ADT) volumes of less than 1500 and are not on National Highway System (NHS) routes.
- Chapter 6, Section 2, Historically Significant Bridge Projects. The minimum criteria previously given in this section has been deleted from the Roadway Design Manual and included in the recently released Historic Bridge Manual.

Instructions

This revision will be distributed online only.

It should be recalled that Manual Notice 2001-2 allowed projects to be designed using the old or new stopping sight distance values through December 2003. Projects let in January 2004 or after must meet the new stopping sight distance criteria or have an approved design exception.

With that caveat, the balance of this manual, and all revisions, will be effective for all projects beginning with the January 2003 letting. This manual, and all revisions, applies to all highway and street project development, whether developed by the department or with consultant staff. Project development using this manual and its revisions prior to those dates are at the option of the district.

Contact

For general comments and suggestions for future revisions of this manual, contact the Design Division, Roadway Design Section.

Copyright Notice

This Roadway Design Manual and all revisions:
Copyright © 2002 by Texas Department of Transportation (TxDOT)
Published by the Design Division (DES)
All rights reserved.

Manual Notice 2001-2

To: All Districts and Divisions

From: Robert L. Wilson, P.E.

Subject: Manual Revision

Manual: *Roadway Design Manual*

Date: July 2, 2001

Purpose

This revision is intended to update the Roadway Design Manual and, specifically, update and convert Chapter 2 to US Customary and Metric (dual) units in accordance with the new 2001 Edition of the AASHTO publication, "A Policy on Geometric Design of Highways and Streets" (Green Book).

Contents

The following updates and additions have been made.

- Chapter 2. The chapter as a whole has been updated in accordance with the 2001 Edition of the AASHTO Green Book. The chapter has been converted to dual units to show both US Customary and Metric values. AASHTO has continued to use a hard conversion for their dual unit publication. However, recognizing that the speed conversions were not directly correlated, tables based on speed have been provided in both US Customary and Metric units. In addition to the general update of the chapter to reflect the new 2001 Edition of the Green Book, two specific areas of change in Chapter 2 are noted below.
- Chapter 2, Table 2-1. AASHTO has modified the stopping sight distance model and the stopping sight distance values. The modification has resulted in an increase in stopping sight distance values as shown in the following partial table. Because this change in the stopping sight distance model has an effect on long term planning, project design, and right of way acquisition, projects may be designed to the old or new stopping sight distance values through December, 2003. Projects let in January, 2004 or after must meet the new stopping sight distance criteria or have an approved design exception.

STOPPING SIGHT DISTANCE (SSD) VALUES				
Speed (mph)	**Old SSD Value (ft)**	**New SSD Value (ft)**	**Difference (ft)**	**Percent Change**
30	200	200	(+) 0	(+) 0%
40	275	305	(+) 30	(+) 11%
50	400	425	(+) 25	(+) 7%
60	525	570	(+) 45	(+) 9%
70	625	730	(+) 105	(+) 17%

- Chapter 2, Section 6, Sidewalks and Pedestrian Elements. This section is a complete rewrite of the old Sidewalk section. This rewrite is to accomplish the expected changes to the Americans with Disabilities Act Accessibility Guidelines (ADAAG) and the Texas Accessibility Standards (TAS).
- Chapter 1, Section 2, Design Exceptions, Design Waivers, and Design Variances. In the first paragraph under Design Exceptions, the references to the Roadway Design Exception Committee and the Bridge Design Exception Committee have been replaced with a link to the Project Development and Policy Manual for procedures to handle design exception requests.
- Chapter 1, Section 2, Design Exceptions, Design Waivers, and Design Variances. Superelevation (high volume roadways) and Grades (high volume roadways) have been called out specifically as design exceptions for 3R projects. Border width has been deleted as a design waiver for 4R projects. Superelevation (low volume roadways) and Grades (low volume roadways) have been called out specifically as design waivers for 3R projects.
- Chapter 1, Section 4, Additional Access to the Interstate System. This section has been added to the manual to give the requirements for additional access requests to the interstate system.
- Chapter 3, Section 2, Table 3-1. The table has been revised to increase border widths to better accommodate pedestrian facilities and utilities. Also, in accordance with the changes in Chapter 2 to Sidewalks and Pedestrian Elements, the old footnote 11 has been deleted to now indicate that the minimum sidewalk width is 5 ft [1.5 m].
- Chapter 3, Section 2, Medians. The last paragraph under Raised Medians has been revised to indicate divider widths to accommodate maintenance and pedestrian considerations.
- Chapter 3, Section 2, Median Openings. The last paragraph under Dual Left-Turn Lanes was revised to indicate divider widths to accommodate maintenance and pedestrian considerations.
- Chapter 3, Section 3, Table 3-5. The table has been revised to increase border widths to better accommodate pedestrian facilities and utilities. Also, in accordance with the changes in Chapter 2 to Sidewalks and Pedestrian Elements, the old footnote 8 has been deleted to now indicate that the minimum sidewalk width is 5 ft [1.5 m]. The old footnote 3 concerning an ADT threshold for shoulder consideration has been deleted.

- Chapter 3, Section 6, Table 3-19. The table has been expanded to specifically show frontage road shoulder widths for two-way operations and inside/outside shoulder widths for one-way operations.
- Chapter 3, Section 6, Ramps and Direct Connections. A discussion and reference has been added concerning suggested ramp design techniques to accommodate ramp metering.
- Chapter 4, Section 4, Table 4-4. The table has been expanded to specifically show frontage road shoulder widths for two-way operations and inside/outside shoulder widths for one-way operations.
- Chapter 5, Section 1, First Paragraph. A sentence has been added to indicate that structural components within 2R projects should be coordinated with the Bridge Division.

Instructions

This revision will be distributed online only. This manual, and all revisions, applies to all highway and street project development, whether developed by the department or with consultant staff. The dates previously given in Manual Notice 2001-1 and Manual Notice 2000-1 for implementation of the Roadway Design Manual are rescinded. With the exception of the stopping sight distance values given in Table 2-1, this manual, and all revisions, will be effective for all projects beginning with the March, 2002 letting. Project development using this manual and its revisions prior to that date is at the option of the district. As the additional chapters are converted to dual units, they will be released on an individual chapter basis.

Contact

For general comments and suggestions for future revisions of this manual, contact the Design Division.

Manual Notice 2001-1

To: Districts and Divisions

From: Kirby W. Pickett, P.E.

Functional Manual: *Roadway Design* Manual

Date: January 23, 2001

Purpose

This revision is intended to correct errors contained in the original release of the manual. This update also adds Appendix B to the Roadway Design Manual.

Contents

The following corrections or additions have been made.

- Table 2-5: Minimum Radii and Superelevation Transitions Lengths for Limiting Values of e and f for Low-Speed Urban Streets. Under the column, Superelevation Transition Length, the "Transition Length Not Required" is applicable to 30, 40, 50, 60 km/h for all max. e values of (-0.02).
- Figure 2-11: Sidewalks at Driveway Aprons. This figure has been reoriented on the page.
- Figure 3-2: Cross Sections for Arterial and Collector Two-Lane Rural Highways. This figure has been redone to enhance the legibility of the PDF version.
- Figure 3-11: Recommended Access Control at Entrance Ramp Junction with Frontage Road. The location of note 1 in the figure was incorrectly placed and has been relocated. Also, the text of note 1 should indicate 30 m in two places as opposed to the incorrectly shown 45 m.
- Chapter 3, Section 6, Subheading Driveways and Side Streets. Four references in the fifth paragraph were changed from 45 m to 30 m to agree with Figure 3-11.
- Figure 3-30: Typical Exit Ramps Without Frontage Roads. Added to this figure is a reference in the title to the PDF format.
- Appendix A, Section 7, Example Problems. This section referred to incorrect figure numbers both in the text and on the drawing themselves. The figure numbers in this section, both in the text and on the drawings, have been changed.
- Appendix B, Treatment of Pavement Drop-offs in Work Zones. This appendix is added to the Roadway Design Manual. This appendix replaces correspondence entitled, Guidelines for Pavement Dropoffs, sent to the districts by the Highway Design Division on November 30, 1987.

Instructions

This revision will be distributed online only. This manual, and all revisions, applies to all highway and street project development, whether developed by the department or with consultant staff. This manual, and all revisions, will be effective for all projects beginning with the September, 2001 letting. Project development using this manual and its revisions prior to that date is at the option of the district.

Contact

For general comments and suggestions for future revisions of this manual, contact the Design Division.

Manual Notice 2000-1

To: All Districts and Divisions

From: Kirby W. Pickett, P.E.

Functional Manual: *Roadway Design Manual*

Date: December 1, 2000

Purpose

This manual is intended to provide guidance in the selection of geometric design criteria for highway and street project development. This manual represents a synthesis of current information and operating practices related to the geometric design of different classifications of roadway facilities.

Contents

The manual contains geometric design information including chapters on - General Design, Basic Design Criteria, New Location and Reconstruction (4R) Criteria, Non-Freeway Rehabilitation (3R) Criteria, Non-Freeway Resurfacing or Restoration Projects (2R), Special Facilities, and Miscellaneous Design Elements. It contains online links to procedural manuals currently available online as well as those under development.

This release of the manual presents units in metric notation. The manual will receive future updates on a chapter by chapter basis in which the notation will be changed to dual units representing both United States customary and metric units in accordance with unit relationships expressed in publications of the American Association of State Highway and Transportation Officials (AASHTO).

Action Required

This manual applies to all highway and street project development, whether developed by the department or with consultant staff. This manual will be effective for all projects beginning with the September, 2001 letting. Project development using this manual prior to that date is at the option of the district.

Contact

For general comments and suggestions for future revisions of this manual, contact the Design Division.