CT DESIGN DELEGATION AND DISTRICT DESIGN LIAISON (DDL)

- DDL position was created to replace HQ Geometric Reviewer in each CT district as a result of the Design Delegation, which transfers approval authority to the District Director for application of certain standards and policies previously held by the HQ DOD.

- In 2015, all District Directors entered into Design Delegation Agreement (DDA).

- D 7 has 1st DDA on February 13th 2015 and the updated DDA on March 19th 2020.
## Delegated Design Decisions

### Design Decision Delegation Authority Granted to District 7

<table>
<thead>
<tr>
<th>Manual/Topic</th>
<th>Description</th>
<th>Conventional Highway</th>
<th>Expressway</th>
<th>Freeway</th>
<th>Interstate Freeway</th>
<th>Sub-Delegation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underlined Design Standards</td>
<td>Authority to approve deviations from Underlined Standards is delegated to the District Director as noted in the HDM Chapter 6C.</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>DDD of Design</td>
</tr>
<tr>
<td>Boldface Design Standards (Except for Chapter 600)</td>
<td>Boldface standards use the word &quot;shall&quot;.</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>DDD of Design</td>
</tr>
</tbody>
</table>

### Design Information Bulletins (DIB)

<table>
<thead>
<tr>
<th>DIB</th>
<th>Description</th>
<th>Yes/No</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEB 70</td>
<td>21. Project certification Design guidance and Standards for roadway Rehabilitation Projects and Certain Other Projects</td>
<td>Yes</td>
</tr>
<tr>
<td>DEB 82</td>
<td>Pedestrian Accessibility Guidelines for Highway Projects and ADA</td>
<td>Yes*</td>
</tr>
<tr>
<td>DEB 83</td>
<td>Caltrans Supplement to HWA Calvert Repair Practices Manual</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### Project Development Procedures Manual (PDPM)

<table>
<thead>
<tr>
<th>Manual/Topic</th>
<th>Description</th>
<th>Conventional Highway</th>
<th>Expressway</th>
<th>Freeway</th>
<th>Interstate Freeway</th>
<th>Sub-Delegation</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDPM 12-Section 4</td>
<td>Traffic signed projects that introduce or perpetuate nonstandard conditions - Exceptions to Boldface Design Standards</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
• Solving problems those need SME involvement.
• Guidance on application of new policies
• Review new policies and provide input.
• For PoDI and Processing Access Modification requests on Interstate routes

• Provides guidance and recommendations for solution of design problems and accurate application of CT standards
• Reviews all types of design products towards approval
• Provides training on CT design policies and procedures

• Guidance for resolving any conflicting design issues.
• Conceptual approval of project alternatives
• Approval of design products
• Update about latest CT design policies
CT Project Development Philosophy (HDM 81.1)

The Project Development process seeks to provide a degree of mobility to users of the transportation system that is in balance with other values. In the development of transportation projects, social, economic, and environmental effects must be considered fully along with technical issues so that final decisions are made in the best overall public interest.

Attention should be given to:

- All users — motorists, bicyclist, transit riders, and pedestrians
- Community goals and objectives
- Needs of low mobility and disadvantaged
- Eliminating or minimizing adverse effects on natural resources, environmental values, public services, aesthetic values...
- Realistic financial estimates
- Cost, ease and safety of maintaining whatever is built
HDM Guidelines:

• Sound Judgement in applying standards
• Flexibility in applying standards
• Documenting design decisions considering the context of project location
• Specific circumstances while maintaining safety
• Equal or exceed the minimum value in the manual to the maximum extent possible
• Cost, traffic volume, operational and safety benefits, project goals, right of way, environmental and socio-economic impacts to be considered
Types of HDM Standards

- **Boldface** type (Table 82.1A)
- **Underlined** type (Table 82.1B)
- Decisions requiring other approvals (Table 82.1C)
- Permissive standards (“should”, “may”, “can”)
- Absolute requirements
104.1 General Policy
Control of access is achieved by acquiring rights of access to the highway from abutting property owners and by permitting ingress and egress only at locations determined by the State.

On freeways, direct access from private property to the highway is prohibited without exception. Abutting ownerships are served by frontage roads or streets connected to interchanges.

203.4 Curve Length and Central Angle
The minimum curve length for central angles less than 10 degrees should be 800 feet to avoid the appearance of a kink. For central angles larger than 30 minutes, a curve is required without exception. Above a 20,000-foot radius, a parabolic curve may be used. Sight

404.2

(6) Sidewalks. Tracking width and swept width lines must not encroach onto sidewalks or pedestrian refuge areas, without exception.

(7) Obstacles. Swept width lines may not encroach upon obstacles.

904.4

In areas subject to frost and snow, plantings should not be located where they will cast shade and create patches of ice on vehicle and pedestrian thoroughfares. Without exception locate plants to maintain visibility to legal off-premise and on-premise outdoor advertising displays. Typical visibility viewsheds are as shown in the Encroachment Permits Manual 509.4.

(1) Maintenance Considerations. Consider the safety of maintenance workers and the traveling public when locating plants. Evaluate the mature size, form, and characteristics of the species, and long-term maintenance requirements.
The rationale for design immunity is:

“to prevent a jury from second-guessing the decision of a public entity by reviewing the identical questions of risk that had previously been considered by the government officers who adopted or approved the plan or design.”

The design immunity defense requires three essential elements:

1. a causal connection between the design of the public property and plaintiffs’ injuries;
2. discretionary approval of the design before construction by a person authorized to give the approval; and
3. substantial evidence of the reasonableness of the design.
D 7 Nonstandard Design Feature
Approval Authority

• **On Interstate Routes:**
  • Boldface: PDC
  • Underlined: Design Office Chief

• **On State Routes:**
  • Boldface & Underlined: Design Office Chief

• **Permissive standards:** Document in Project File

• **Decisions requiring other approvals:**
  • Respective approval authority and recommended document type

82.2 Approvals for Nonstandard Design

(1) **Boldface Standards** Design features or elements which deviate from standards indicated in boldface type require the approval of the Chief, Division of Design. This approval authority has been delegated to the District Directors for projects on conventional highways and expressways, and for certain other facilities in accordance with the current approval authority for design standards indicated for these projects. The standard has been delegated for local deviations from standards indicated in the Design Standards. A list of these standards is periodically provided to the District Directors. A list of these standards can be discussed during the review and documentation of the approval documentation. The list of permissive standards has also been provided to the respective approval authority to approve specific decisions when required. The form of documentation or other evidence of specific approval authority.

Approval has not been delegated for projects that do not provide or maintain a minimum vertical clearance over the Department of Defense Rural and Single Interstate Route System.
DSDD is the recommended form by HQ DOD to document engineering decisions made regarding a proposed design that deviates from the design standards in the HDM.

Guidance and template is available in PDPM Appendix BB.
WHAT PHASE DO WE NEED A DSDD?

Design Standard Risk Assessment (DSRA)
Design Standard Decision Document (DSDD)

PID | Project Initiation Document
PAED | Project Approval/Environmental Document
PS&E | Plans, Specification, & Estimate
Cons | Construction (Before Feature is Constructed)

Identify nonstandard features early & discuss w/oversight engineer & DDL
DSDD TIPS AND COMMON MISTAKES
SECTION 1 — PROPOSED PROJECT

Project Description

• Brief but focused description of the proposed project improvement
• For supplemental DSDD, discuss original approved DSDD and why a supplemental is needed.
• Refer to Project Location Map

Existing Highway

• Route Classification
• Complete Geometric Description
• Posted Speed
• Design Designation (HDM 103.1)
DSDD TIPS AND COMMON MISTAKES
SECTION 1 – PROPOSED PROJECT

Safety Improvements

• How will safety be improved by the project over the existing condition?
• Reference safety upgrades that the project will incorporate as a result of a safety study.

Total Project Cost

• Cost Breakdown:
  • Roadway
  • Structure
  • Right-of-Way
• Detail Cost Estimate Not Needed

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roadway Items</td>
<td>$ XXX,000</td>
</tr>
<tr>
<td>Structure Items</td>
<td>$ XXX,000</td>
</tr>
<tr>
<td>Right-of-Way Items</td>
<td>$ XXX,000</td>
</tr>
<tr>
<td>Total Project Cost</td>
<td>$ XXX,000</td>
</tr>
</tbody>
</table>
DSDD TIPS AND COMMON MISTAKES
SECTION 2 — FEATURES REQUIRING DESIGN DECISION DOCUMENTATION

- Section A - Design Features with HQ Approval Authority
- Section B - Design Features with District Delegated Approval Authority

Design Feature (Section A & B)

- Include Table with Standard, Proposed and Existing value of the design feature with location (station) and related exhibits

<table>
<thead>
<tr>
<th>Design Feature</th>
<th>Location</th>
<th>Decision Sight Distance (Corresponding Design Speed)</th>
<th>Attachment B Sheet No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Line</td>
<td>From</td>
<td>To</td>
</tr>
<tr>
<td>B1.1</td>
<td>&quot;A&quot;</td>
<td>982+35</td>
<td>999+57</td>
</tr>
</tbody>
</table>
DSDD TIPS AND COMMON MISTAKES
SECTION 2 – FEATURES REQUIRING DESIGN DECISION DOCUMENTATION

Design Feature (Section A & B)

• Combined discussion where multiple standards apply for a design feature (list all standards)
• Only include the Boldface or Underlined standard statements from HDM for which exception is requested

Design Standard for Which Documentation Is Required:

HDM Index 302.1 Width – Shoulder
The shoulder widths given in Table 302.1 shall be the minimum continuous usable width of paved shoulders on highways. Per Table 302.1 for a 2-lane new construction on conventional highway to see Index 307.2.

HDM Index 307.2 Two-lane Cross Sections for New Construction
Shoulder widths based on design year traffic volumes shall conform to the standards given in Table 307.2. Since the geometrics are being changed on the existing highway, this standard is considered applicable. Based on Table 307.2 with SR-33 having a two-way AADT of 8,980 ((meeting the "Over 400 Two-way ADT" category of Table 307.2) for the design year, the standard shoulder width is 8' and per the referenced Index 405.3(2)(a) the minimum shoulder width shall be 4' when adjacent to right turn lanes. Non-standard right turn only lanes are addressed in Design Feature 3 below.

HDM Index 309.1 (2)(b) Horizontal Clearances for Highways, Clear Recovery Zone, Discretionary Fixed Objects
When discretionary fixed objects are constructed on freeways, expressways or conventional highways, they should be located beyond the clear recovery zone at a minimum of 50 feet horizontally or 8 feet vertically, or clear from the planned ultimate.
Reason For Not Using Design Standard

- Use sensible & clear statements for justification
- Include engineering and technical explanation
- Describe how performance is acceptable
- State specific resources used to justify nonstandard condition
- Indicate facts (i.e. actual lengths/widths) instead of using subjective adjectives
- If environmental impacts are a reason, elaborate & be consistent w/ED
• If R/W impacts are a reason, elaborate partial/full take & type of property (4f or not)
• Include discussion about the relation between the design feature and predominant type of collisions observed (from latest 3 years TASAS data)
• Include mitigations proposed where applicable
• Consult appropriate functional units and include their input where required
• Ensure consistency between DSDD text and exhibit
Collision Analysis

- Use the latest 3-year period
- Don’t just state the collision data, highlight the relation between collision types and nonstandard features
- Discuss improvements proposed that mitigate & its impact on safety
- Discuss HSM analysis outcomes where applicable.
DSDD TIPS AND COMMON MISTAKES
SECTION 8 – ATTACHMENTS

• Black and White, no color copies or color photos
• Standard Paper Sizes 8.5”x11”, 8.5”x14”, 11”x17”
• Don’t attach TASAS/Collision report
• Exhibits provide a clear picture of exception (typical sections, layouts, labels/callouts/dimensions, relevant info only, not project plans, etc)
DSDD TIPS AND COMMON MISTAKES

GENERAL

- Easy to Explain
- No Vague or Open-ended Statements
- Discussion and Exhibits are Clear
- Elaborate & Provide Details
- Check for Inconsistencies
- Work with Oversight Engineers
HIGHWAY SAFETY MANUAL (HSM)

Memorandum

Date: August 12, 2019

To: DEPUTY DISTRICT DIRECTORS, Traffic Operations
DEPUTY DISTRICT DIRECTORS, Design

From: JASVINDERJIT S. BHULLAR
Chief
Division of Traffic Operations

JANICE BENTON
Chief
Division of Design

Subject: PROJECT GUIDANCE FOR PERFORMANCE-BASED DECISION-MAKING USING HIGHWAY SAFETY MANUAL

This memorandum provides project guidance on implementing performance-based decision-making processes for highway design using the American Association of State Highways and Transportation Officials Highway Safety Manual (HSM). The HSM is a nationally recognized reference that can be used to make informed performance-based decision-making on design solutions. The purpose of the HSM is to provide fact-based statistical information and proven data-driven analysis tools for collision frequency prediction. The HSM can facilitate the integration of quantitative collision frequency and severity performance measures into roadway planning, design, operations, and maintenance decisions. The primary focus of the HSM for the California Department of Transportation is to increase the use of analytical tools to assess the safety impacts of transportation projects and program decisions.

The HSM shall be used based on the project application guidelines in the Performance-Based Decision-Making Using Highway Safety Manual Project Application Guidelines document (attached). The HSM implementation shall apply to projects that meet the minimum criteria specified in the guidelines and have a Project Approval and Environmental Document date after June 30, 2020.

This guidance shall be effective until superseded by a subsequent memo or the appropriate updated project development guidance manuals.

"Provide safe, sustainable, integrated and efficient transportation system to enhance California's economy and quality."
PHASED IMPLEMENTATION

1. Rural 2-lane highways and intersections:
   Implementation Date: August 2020
2. Rural multilane highways and intersections:
   Implementation Date: October 2020
3. Urban & Suburban Arterials:
   Implementation Date: December 2020
4. Freeways:
   Implementation Date: January 2021
WHAT IS HSM?

- Guidance Document for Incorporating Quantitative Safety Analyses
- Scientific Methodologies for Estimating Safety Performance
- Published in 2010, Supplement in 2014
- 2nd Edition expected to be published in 2022
WHY USE HSM?

- Performance Based Decision
- Improve Safety Analyses
- Encourages a “science-based” technical approach to safety analysis
- Minimizes biased results
- Nominal vs Substantive Safety
NOMINAL VS SUBSTANTIVE

CRASH RISK

12 ft Standard

Nominal Safety is an Absolute

Substantive Safety is a Continuum

Lane Width

DESIGN DIMENSION
(Lane Width, Radius of Curve, Stopping Sight Distance, etc.)

Greater
Identify Where Safety Improvements are Needed

Provides Understanding of How Driver Perceptions Can Lead to Crashes

Determine the Expected Benefits from Making a Safety Improvement

Provides a Data-Driven Process for Improving Safety

Discuss Findings in DSDD or PR for Collision Analysis and/or Justification
RESOURCES

DSDD

• Project Development Procedure Manual
  • Chapter 21
  • Appendix BB & DSDD Template
• Caltrans Highway Design Manual
• Design Info Bulletin 78 - Design Checklist

HSM

• Performance Based Decision Making Memo using HSM
• AASHTO - HSM
QUESTIONS?