Safety Briefing

- Who is first aid trained?
- Who will call 911?
- Who will get the defibrillator?
- Who will call the safety officer?
- Address of this complex?
Logistics

Bathrooms

Breaks

Cell Phones/Bricks
Introductions

- Name?
- Office?
- Position?

Participate

- Get Out what you put in
- Ask Questions
Class Goals and Objectives

After taking this course, you should understand:

- Terminology associated with design documentation
- Design Approval documentation
- Project Development Approval documentation
- Contents of a Design Documentation Package

You will also be provided with contact information and examples
Why Do We Set Standards for Documentation?

• Litigation and Liability
  – Washington State is a Joint and Several state
  – Washington State has no cap on the monetary value of a civil lawsuit
  – It is easier to defend a well documented decision than a good decision without documentation
Why Do We Set Standards for Documentation?

• Consistency
  – Inconsistency benefits the plaintiff
  – If a particular document is missing then there is a hole in the documentation
  – Saves time and money in research preparation for a defense team

• FHWA Stewardship and Oversight (S&O) Agreement
  – WSDOT must follow the S&O to receive federal funds
  – Contains documents needed for a FHWA Audit
Why Do We Set Standards for Documentation?

Most Importantly it captures:

Why did you do that?
Course Outline

This training will cover:

– Design Approval (DA)
– Project Development Approval (PDA)
– Design Documentation Package (DDP)
– Project File (PF)
– Process Review
Design Documentation

Design Documentation Package
Design Documentation Package

**Design Approval**
- Stamped Cover Sheet
- Project Description Memo
- Vicinity Map
- Project Summary Documents
- Basis of Design
- Alternatives Comparison Table
- Design Parameter Worksheet
- Safety Analysis
- Design Analysis
- List of Known Variances
- Interchange and/or Intersection Plans
- Alignment Plans and Profiles
- Basis of Estimate

**Project Development Approval**
- All Updated Items from Design Approval plus
- NEPA Approvals
- SEPA Approvals

**Project File (items may be necessary for advertisement but not retained for 75 years)**

**Design Documentation Package (Retained for 75 years)**

- Maximum Extent Feasible
- Intersection Control Analysis
- Roundabout Geometric Design
- Signal Permit
- Median Crossover Approval
- Traffic Analysis
- Fencing
- Additional Illumination
- ITS System Engineering Docs
- Barrier Length of Need Calcs
- Public Art Plan
- Justifications
- Approvals
# Design Approval

<table>
<thead>
<tr>
<th>Description</th>
<th>DM Ref.</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DESIGN APPROVAL DOCUMENTS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stamped Cover Sheet *</td>
<td>300</td>
<td></td>
</tr>
<tr>
<td>Design Approval Memorandum</td>
<td>300</td>
<td></td>
</tr>
<tr>
<td>Vicinity Map</td>
<td>PPM</td>
<td></td>
</tr>
<tr>
<td>Project Summary Documents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project Definition</td>
<td>300</td>
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</tr>
<tr>
<td>Project Change Request Report</td>
<td></td>
<td></td>
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<tr>
<td>Environmental Review Summary</td>
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<tr>
<td>Basis of Design*</td>
<td>300, 1100</td>
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<td>Alternatives Comparison Tables</td>
<td>1104</td>
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<td>Design Parameters Worksheets</td>
<td>1105, 1106</td>
<td></td>
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<tr>
<td>Crash Analysis Report or Crash Analysis</td>
<td>321</td>
<td></td>
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<td>Design Analysis *</td>
<td>300, 1106</td>
<td></td>
</tr>
<tr>
<td>Design Variance Inventory System Form</td>
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<tr>
<td>Interchange and/or Intersection Plans</td>
<td>1310, 1360, 1PPM</td>
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<tr>
<td>Alignment Plans and Profiles</td>
<td>300.04(1), 1210, 1220</td>
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<tr>
<td>Basis of Estimate with Cost Estimate</td>
<td>300</td>
<td></td>
</tr>
</tbody>
</table>

See handout and online at [WSDOT - Design Support](#)
### Project Development Approval

- All Items in the Design Approval AND:
  - NEPA Approvals
  - SEPA Approvals

<table>
<thead>
<tr>
<th>PROJECT DEVELOPMENT APPROVAL DOCUMENTS</th>
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</thead>
<tbody>
<tr>
<td>Stamped Cover Sheet*</td>
<td>300</td>
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<tr>
<td>Project Development Approval Memorandum</td>
<td>300</td>
</tr>
<tr>
<td>Vicinity Map</td>
<td>PPM</td>
</tr>
<tr>
<td>NEPA Approvals</td>
<td>300 &amp; EM</td>
</tr>
<tr>
<td>SEPA Approvals</td>
<td>300 &amp; EM</td>
</tr>
<tr>
<td>Any Design Approval items listed above that have been revised or updated</td>
<td>300</td>
</tr>
</tbody>
</table>

See handout and online at [WSDOT - Design Support](#)
## DDP Checklist

**DDP DOCUMENTS REQUIRED PRIOR TO PDA APPROVAL**

Items listed below must be completed before the PDA is signed and can be filed in the PDA or referenced in the PDA and filed with the DDP. There are other items that are required for advertisement that are contained in the Project File.

<table>
<thead>
<tr>
<th>Description</th>
<th>DM Ref.</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Extent Feasible *</td>
<td>1510</td>
<td></td>
</tr>
<tr>
<td>Intersection Control Analysis*</td>
<td>1300</td>
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</tr>
<tr>
<td>Roundabout Geometric Design Report*</td>
<td>1320</td>
<td></td>
</tr>
<tr>
<td>Signals Permit</td>
<td>1330</td>
<td></td>
</tr>
<tr>
<td>Pedestrian Facilities</td>
<td>1510</td>
<td></td>
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<tr>
<td>Value Engineering Recommendation Approval Form</td>
<td>310.06</td>
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<tr>
<td>Justifications</td>
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<td>Multi</td>
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<td>(Subjects range throughout the DM)</td>
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<tr>
<td>Approvals</td>
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<td>Multi</td>
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<td>(Subjects range throughout the DM)</td>
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</tr>
</tbody>
</table>

See handout and online at [WSDOT - Design Support](#)
### Approval Authorities

#### Design Manual Exhibit 300-1

**PROJECT TYPES:**
- Interstate
- NHS
- non-NHS

**APPROVALS:**
- FHWA
- HQ Design
- Region
- Cities/H&LP

|--------------|-----------------------------------|---------------------------------------------|---------------------------------------------------|

See handout
## Approval Authorities

**Design Manual Exhibit 300-2**

<table>
<thead>
<tr>
<th>Item</th>
<th>Approval Authority</th>
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<tr>
<td></td>
<td>Region</td>
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<tr>
<td>Program Development</td>
<td></td>
</tr>
<tr>
<td>Work Order Authorization</td>
<td>X</td>
</tr>
<tr>
<td>Public Hearings</td>
<td></td>
</tr>
<tr>
<td>Corridor Hearing Summary</td>
<td>X [2]</td>
</tr>
<tr>
<td>Design Hearing Summary</td>
<td>X [3]</td>
</tr>
<tr>
<td>Limited Access Findings and Order</td>
<td>X [5]</td>
</tr>
<tr>
<td>Environmental Document</td>
<td></td>
</tr>
<tr>
<td>Class I NEPA (EIS)</td>
<td>[7]</td>
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<tr>
<td>SEPA (EIS)</td>
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<td>Class II NEPA – Categorical Exclusion (CE) Documented in ECS form</td>
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<td>SEPA – Categorical Exemption (CE)</td>
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<td>SEPA – Environmental Assessment (EA)</td>
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<td>SEPA Environmental Checklist &amp; Determination of Non-Significance (DNS)</td>
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<td>Basis of Design (BOD)</td>
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<tr>
<td>Intersection Control Type</td>
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<td>Experimental Features</td>
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<td>Environmental Review Summary</td>
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<td>Final Project Definition</td>
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<td>Non-Interstate Interchange Justification Report</td>
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<td>Break in Partial or Modified Limited Access</td>
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<td>Intersection or Channelization Plans</td>
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<td>Right of Way Plans</td>
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<td>Monorailian Map</td>
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<td>Materials Source Report</td>
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<td>Pavement Determination Report</td>
<td>X [13]</td>
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<td>Roundabout Geometric Design (see Chapter 1320 for guidance)</td>
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<td>Restructuring Report</td>
<td>X [15]</td>
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<td>Signal Permits</td>
<td>X [14]</td>
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<td>Geotechnical Report</td>
<td>X [13]</td>
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<tr>
<td>Tied Bids</td>
<td>X [15]</td>
</tr>
</tbody>
</table>

**Notes:**

1. Federal-aid projects only.
2. Approved by Assistant Secretary, Engineering & Regional Operations.
3. Approved by Director & State Design Engineer, Development Division.
4. Approved by Director of Traffic Plans Manager.
5. Refer to Chapter 210 for approval requirements.
6. Final review & concurrence required at the regional level prior to submittal to approving authority.
7. Final review & concurrence required at HQ prior to submittal to approving authority.
8. On Interstate projects, the Director & State Design Engineer, Development Division (or designee) submits the approved design hearing summary to FHWA for federal approval.
9. See Exhibit 300-1 for BOD Approvals.
10. Approved by HQ Capital Program Development and Management (CPDM).
11. Plan is included in the project manual.
12. Certified by professional registered architect.
13. Submit to HQ for review and approval.
14. Certified by professional registered architect.
15. Approved by Regional Administrator or designee.
16. See the Hydraulics Manual for design criteria.
17. Applies to regions with a Landscape Architect.
18. Applies to regions without a Landscape Architect.
19. Approved by an Engineer.
20. Certified by professional registered architect.
21. Certified by professional registered architect.
22. Certified by professional registered architect.
23. The State Bridge and Structures Engineer reviews and approves the bridge plan (Chapter 950 for details on approvals).
24. Certified by professional registered architect.

See handout
Definitions

• **design up**: An approach to developing project alternatives utilizing the smallest dimension that meet the need by providing the desired performance.

• **minimum**: the least dimension allowed without an approved design analysis.

• **desirable**: Design criteria that are recommended for inclusion in the design
Definitions

• **consider**: To think carefully about, especially in order to make a decision. The decision to document a consideration is left to the discretion of the engineer.

• **document (verb)**: The act of including a short note to the DDP that explains a design decision.

• **justify**: Preparing a memo to the DDP identifying the reasons for the decision: a comparison of advantages and disadvantages of all options considered. A more rigorous effort than document.
Design Documentation Package

**Design Approval**
- Stamped Cover Sheet
- Project Description Memo
- Vicinity Map
- Project Summary Documents
- Basis of Design
- Alternatives Comparison Table
- Design Parameter Worksheet
- Safety Analysis
- Design Analysis
- List of Known Variances
- Interchange and/or Intersection Plans
- Alignment Plans and Profiles
- Basis of Estimate

**Project Development Approval**
- All Updated Items from Design Approval plus
- NEPA Approvals
- SEPA Approvals

**Design Documentation Package (Retained for 75 years)**

**Project File** (items may be necessary for advertisement but not retained for 75 years)
- Maximum Extent Feasible
- Intersection Control Analysis
- Roundabout Geometric Design
- Signal Permit
- Median Crossover Approval
- Traffic Analysis
- Fencing
- Additional Illumination
- ITS System Engineering Docs
- Barrier Length of Need Calcs
- Public Art Plan
- Justifications
- Approvals
Design Approval Purpose

• Sets policy for three years
• Benefits large projects with longer PE phases
• Avoids design changes due to policy changes
• Eliminates the affect of policy changes on:
  – Right of way phase
  – Environmental documentation
• Design Approval and Project Development Approval may be combined on smaller projects
• Design Approval required prior to Request for Proposal for Design Build Projects
Design Approval

Contents

- Stamped Cover Sheet
- Project Description Memo
- Vicinity Map
- Project Summary Documents
- Basis of Design
- Alternatives Comparison Table
- Design Parameter Worksheet
- Safety Analysis
- Design Analysis
- Known Variances
- Interchange and/or Intersection Plans
- Alignment Plans and Profiles
- Basis of Estimate
Stamped Cover Sheet

• DA and PDA can be combined with shorter duration projects
• See approval table in Design Manual Exhibit 300-1
• Template found online
Design Approval

Contents

• Stamped Cover Sheet
• Design Approval Memorandum
• Vicinity Map
• Project Summary Documents
• Basis of Design
• Alternatives Comparison Table
• Design Parameter Worksheet
• Safety Analysis
• Design Analysis
• Known Variances
• Interchange and/or Intersection Plans
• Alignment Plans and Profiles
• Basis of Estimate
Design Approval Memorandum

• Consider it an executive summary
• Explain unique issues
• Memorandum should parallel the structure of the DA package as noted in the DDP Checklist.
• Explain any change management
• List pertinent documents outside the DA:
  • Right of way plans
  • Interchange Justification Reports (IJR)
  • Limited access acquisition and public hearings
  • Agreements
• Design Approval Memorandum template is online
Design Approval

Contents

• Stamped Cover Sheet
• Design Approval Memorandum
• Vicinity Map
• Project Summary Documents
• Basis of Design
• Alternatives Comparison Table
• Design Parameter Worksheet
• Safety Analysis
• Design Analysis
• Design Variance Inventory System Form
• Interchange and/or Intersection Plans
• Alignment Plans and Profiles
• Basis of Estimate
Design Approval

Contents

• Stamped Cover Sheet
• Design Approval Memorandum
• Vicinity Map
• Project Summary Documents
• Basis of Design
• Alternatives Comparison Table
• Design Parameter Worksheet
• Safety Analysis
• Design Analysis
• Known Variances
• Interchange and/or Intersection Plans
• Alignment Plans and Profiles
• Basis of Estimate
Project Summary - Changes

PROJECT SUMMARY

CURRENT

- Stored in FileMaker Pro

CONTAINS
- Project Definition
- Design Decision Summary/BOD
- Environmental Review Summary

FUTURE

- Stored in TEIS (Transportation Executive Information System)

CONTAINS
- Project Profile (& Basis of Estimate)
- Basis of Design
- Environmental Review Summary
Project Definition

- Created from the scoping process along with the project's Work Order
- Includes a high clip summary of project information and budget
- Handed to the Design Team at the beginning of the project
Design Decisions Summary

- Provided at the beginning of the project
- Captures major elements of the project including geometric dimensions
- Being phased out and replaced by the Basis of Design
Environmental Review Summary

- Completed by the Environmental Office for your project
The old Project Summary lacks context and alternatives. The new process incorporates these into the BOD.
Project Profile

- Project Profile replaces the Project Definition
- Created as a result of the scoping process
- Stored in TEIS
Design Approval

Contents

• Stamped Cover Sheet
• Design Approval Memorandum
• Vicinity Map
• Project Summary Documents
• Basis of Design
• Alternatives Comparison Table
• Design Parameter Worksheet
• Safety Analysis
• Design Analysis
• Known Variances
• Interchange and/or Intersection Plans
• Alignment Plans and Profiles
• Basis of Estimate
Basis of Design
New Process Highlights

- Understand the Project Need including the contributing factors
- Consider the Context
- Evaluate Design Controls
- Formulate & Evaluate Alternatives that meet the need
- Document selection of Design Elements
- Document selection of Dimensions
Basis of Design (BOD)

- New form online September 2017
- New form updated to match the July 2017 Design Manual
- New form applicable for projects designed in accordance with July 2017 Design Manual
  - If your BOD is complete, you do not need to do another one
  - If your BOD is in progress, contact your ASDE to determine if you need to use the new form
- New form changes Sections 1 through 3
Basis of Design

Basis of Design Form Date: 08-02-17
Project Title: SR 999 Elm Street to Fulton Street - Paving
PIN: 199924C
Date: October 16, 2017

Basis of Design Phase
(Identify the current project phase)

Related Planning Documents and Technical Reports

Pavement Design Report – SR 999 Elm Street to Fulton Street Paving Rehabilitation, November 16, 2016; HQ concurrence – February 7, 2017
Town A comprehensive plan – December 12, 2011
## Basis of Design

<table>
<thead>
<tr>
<th>Route Information</th>
<th>Project Information</th>
<th>Future and Related Projects</th>
<th>Major Enviro Considerations</th>
</tr>
</thead>
</table>

### General Project Information

<table>
<thead>
<tr>
<th>Route Information</th>
<th>SR</th>
<th>NHS (Y/N)</th>
<th>Functional Class</th>
<th>Current Posted Speed</th>
<th>Truck %</th>
<th>Current ADT</th>
</tr>
</thead>
<tbody>
<tr>
<td>999</td>
<td>Y</td>
<td>Principal Arterial</td>
<td>35 MPH</td>
<td>1%</td>
<td>4300</td>
<td></td>
</tr>
<tr>
<td>Begin MP</td>
<td>1.0</td>
<td>End MP</td>
<td>Sub-Program</td>
<td>County</td>
<td>Within City?</td>
<td>Funding</td>
</tr>
<tr>
<td></td>
<td>1.32</td>
<td></td>
<td>I-1 – Paving</td>
<td>Snohomish</td>
<td>Yes</td>
<td>State Funded</td>
</tr>
<tr>
<td>Existing Access Control</td>
<td>Managed</td>
<td>WSDOT Planned Access Control</td>
<td>Managed</td>
<td>DBB</td>
<td>DBB</td>
<td></td>
</tr>
<tr>
<td>Project Information</td>
<td>Project Proposed Access Control</td>
<td>Project Delivery Method – Probable</td>
<td>Project Delivery Method – Final</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Brief Project Description

This project will mill and fill 0.15 ft HMA curb to curb on SR 999.

### Important Project History or Background Information

P-1 paving project that, through community engagement it was determined that alternatives should be considered that accommodate bicycles. Resulting geometrics changes require a Basis of Design.

### Future and Related Projects

Next planned paving in approximately 10 years.

### Major Environmental Considerations

As per Region Environmental, there are no environmental considerations.
Community Engagement

| Describe Community Engagement | Region Planning Office coordination with the City has identified a long-term vision of the SR 999 corridor in their Comprehensive Plan that includes providing bicycle facilities. Contacted the Cascade Bike Club. They support the City's Comprehensive Plan for bike lanes. |

- Now upfront in new BOD form.
- If you do not know what community engagement took place, check with the Planning Office, Program Management, or scoping squad.
- Capture how we've engaged with the project stakeholders and the public.
## Basis of Design

### Baseline Needs
Need(s) that triggered the project or are brought by a funding partner.

### Metric and Target
For each baseline need. Targets may be quantitative or qualitative.

### BOD – Section 1
**Understand the Project Need**
Including the contributing factors

### Section 1) Project Needs
<table>
<thead>
<tr>
<th>Baseline Need</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BN1 Pavement Preservation</strong></td>
<td>Last year’s pavement tour showed that SR 999 between MP 1.00 and MP 1.32 is showing signs of deterioration and is due for resurfacing in 2016 according to the pavement management system.</td>
</tr>
</tbody>
</table>
  - **Metric:** Square yards of pavement deterioration
  - **Target:** Zero square yards of pavement deterioration

Baseline need(s) – must be addressed by the project.
### Basis of Design

**CONTEXTUAL NEEDS:** Non-baseline needs that will be used to rank alternatives

**METRIC and TARGET** for each need. Targets may be quantitative or qualitative

<table>
<thead>
<tr>
<th>Section 1) Project Needs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CN1 - Bicycle Connectivity</strong></td>
</tr>
<tr>
<td>SR 999 has bike lanes accept for this section between MP 1.00 and MP 1.32 so bicyclists either ride in the traffic lane as there is no shoulder or on the sidewalk which is against Town A’s laws. The potential bicyclists say that they want to ride on SR 999 but do not feel comfortable riding in the traffic lane so they are having to going out of their way by taking other streets to get around this section.</td>
</tr>
<tr>
<td><strong>Metric &amp; Target:</strong> Bike connectivity between MP 1.00 and 1.32</td>
</tr>
<tr>
<td><strong>CN2 - Safety</strong></td>
</tr>
<tr>
<td>In the last 5 yrs, SR 999 between MP 1.00 and 1.32 has had no fatal or injury crashes.</td>
</tr>
<tr>
<td><strong>Metric &amp; Target:</strong> Similar or less risk of fatal or injury crashes.</td>
</tr>
<tr>
<td><strong>CN3 - Mobility</strong></td>
</tr>
<tr>
<td>This section of SR 999 between MP 1.00 and 1.32 with an ADT of 4300 operates at Level of Service (LOS) A.</td>
</tr>
<tr>
<td><strong>Metric &amp; Target:</strong> LOS A.</td>
</tr>
</tbody>
</table>

**Contextual Needs – may or may not be addressed**
### Section 1) Project Needs

**What are the Contributing Factors of each baseline and contextual need?**

- **BN1 - Pavement Preservation**
  - Past the pavement design life.
  - Potholes caused by delamination by traffic.

- **CN1 - Bicycle Connectivity**
  - The last time this section of SR 999 was modified, there were no bikes traveling through town.

- **CN2 - Safety**
  - There is no problem with safety.

- **CN3 - Mobility**
  - There is no problem with mobility.

**Has a safety analysis been completed (per DM Chapter 321 and the Safety Analysis Guide)?**

- ☒ No  ☐ Yes

The Field Assessment Engineer verified there have been no safety issues. The safety performance of the alternatives will be calculated to help determine the preferred alternative.

*(If YES, enter the title and date. If NO enter why it was not needed)*
**Basis of Design**

**Complete this section in consultation with your Region Planning Office**

This example is an urban non-freeway highway

Use SR MPs from the [State Route Log](#)

<table>
<thead>
<tr>
<th>Section 2) Context</th>
<th>In consultation with Region Planning Office</th>
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<tbody>
<tr>
<td><strong>Roadway</strong></td>
<td>SR 999 MP 1.0 to MP 1.32</td>
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<tr>
<td>[Duplicate this section as necessary to reflect 1) current/future conditions and 2) applicable milepost ranges]</td>
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<table>
<thead>
<tr>
<th>Land Use Context</th>
<th>Freeway</th>
<th>Non-Freeway</th>
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<tr>
<td></td>
<td>For freeways, document the urban/rural designation as listed on the State Route Log</td>
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<tr>
<td></td>
<td>□ Rural □ Urban □ Interstate □ Non-Interstate</td>
<td>□ Rural □ Suburban □ Urban □ Urban Core</td>
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</table>
## Basis of Design

**Complete this section in consultation with your Region Planning Office**

<table>
<thead>
<tr>
<th><strong>Section 2) Context</strong></th>
<th>In consultation with Region Planning Office</th>
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<tbody>
<tr>
<td><strong>Transportation Context</strong></td>
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<td><strong>Freight Use</strong></td>
<td><strong>Freight Route Type</strong></td>
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<tr>
<td>□ P-1 Rare Use</td>
<td>□ T-1 &gt;10M tons/yr</td>
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<tr>
<td>□ P-1 Rare Use</td>
<td>□ T-1 &gt;10M tons/yr</td>
</tr>
<tr>
<td>□ P-3 Medium Volume</td>
<td>□ T-3 0.30 to 4M tons/yr</td>
</tr>
<tr>
<td>□ P-4 High Volume</td>
<td>□ T-5 At least 20,000 tons in 60 days and less than 100,000/yr</td>
</tr>
</tbody>
</table>

**General**

- Coordinate with Region Planning Office. Describe any special design considerations that apply.
- 1% Freight to local businesses.

**Transit Use**

- Coordinate with Region Planning Office. Describe any special design considerations that apply.
- Infrequent “dial a ride” type transit.

**Complete streets and Main Street Highways**

- □ No □ Yes
### Basis of Design

#### Example – I-90 Mercer Slough / Sammamish

**Section 3) Design Controls**
In consultation with Region Planning Office

<table>
<thead>
<tr>
<th>Roadway</th>
<th>SR 999 MP 1.0 to MP 1.32</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Duplicate this section as necessary to reflect 1) current/future conditions and 2) applicable milepost ranges]</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Selected Design Year:</th>
<th>Design year selection rational:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Per WSPMS - 15 years</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Design Users</th>
<th>(Legally Permitted to Use the Facility)</th>
</tr>
</thead>
<tbody>
<tr>
<td>✗ Vehicles,</td>
<td>✗ Bicycles, ✗ Pedestrians, ✗ Freight,</td>
</tr>
</tbody>
</table>

**DESIGN YEAR** with selection rational

Add A narrative about the user modes if useful

**DESIGN USERS** Who can use the facility?
# Basis of Design

Modal Accommodation: Do you have them? Will you have them?

## Section 3) Design Controls

In consultation with Region Planning Office

<table>
<thead>
<tr>
<th>Modal Accommodation Level</th>
<th>Vehicles</th>
<th>Notes: Existing ADT of 4300</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Existing</td>
<td>High □ Medium □ Low</td>
</tr>
<tr>
<td></td>
<td>Design Year</td>
<td>High □ Medium □ Low</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bicycles</th>
<th>Existing</th>
<th>High □ Medium □ Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design Year</td>
<td>High □ Medium □ Low</td>
<td></td>
</tr>
<tr>
<td>Notes: Bikes detour around this road now because they don’t feel safe riding in the traffic lane. But, they would use it with bike lanes.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pedestrians</th>
<th>Existing</th>
<th>High □ Medium □ Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design Year</td>
<td>High □ Medium □ Low</td>
<td></td>
</tr>
<tr>
<td>Notes: Pedestrians walking through this section and to/from businesses in this section.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Freight</th>
<th>(List special design considerations that may apply)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coordinated with Region Planning no special considerations</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Transit</th>
<th>(List special design considerations that may apply)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coordinated with Region Planning no special considerations</td>
</tr>
</tbody>
</table>

BOD – Section 3

Evaluate Design Controls

High, Medium, Low
## Basis of Design

### Modal Priorities:
- Auto, Transit, Freight, Ped, Bike

### Existing and Design Year

<table>
<thead>
<tr>
<th>Mode</th>
<th>Existing</th>
<th>Design Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automobiles</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Transit</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Freight</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Pedestrians</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Bicycles</td>
<td>4</td>
<td>1</td>
</tr>
</tbody>
</table>

### Notes
- Existing ADT of 4300
- There is only “Dial a Ride” type transit.
- There is only 1% trucks
- Pedestrians use the existing sidewalks a lot.
- Bikes detour around this road now because they don’t feel safe riding in the traffic lane. But, they would use it with bike lanes.
# Basis of Design

## Section 3) Design Controls

In consultation with Region Planning Office

<table>
<thead>
<tr>
<th>Basis of Design</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intersection Design Vehicle</td>
<td>Passenger vehicles (Roadway segments and all intersection legs)</td>
</tr>
<tr>
<td>Terrain Classification</td>
<td>Level</td>
</tr>
<tr>
<td>Access Control</td>
<td>Managed – Class 5</td>
</tr>
<tr>
<td>Target Speed</td>
<td>35 MPH (Same as Posted speed)</td>
</tr>
</tbody>
</table>

BOD – Section 3

Evaluate Design Controls
**Basis of Design**

- Summarize alternatives
- Note preferred alternative
- Use BOD for simple alternative comparison
- Detailed comparison in Alternative Comparison Table (ACT)
- Intersection Control Analysis (ICA) may be referenced

### Section 4) Alternatives Analysis

<table>
<thead>
<tr>
<th>Alternatives Considered</th>
<th>Alternative Name or Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>No-Build - Retain Existing Channelization w/o bike lanes</td>
</tr>
<tr>
<td>B</td>
<td>5 ft. Bike lanes, an 11 ft. lane in each direction, and a center 12 ft. two-way left-turn lane</td>
</tr>
<tr>
<td>C</td>
<td>4 ft. Bike lanes, 2 ft. buffers with candle sticks, an 11 ft. lane in each direction, and a center 10 ft. two-way left-turn lane</td>
</tr>
<tr>
<td>D</td>
<td>6 ft. Bike lane on north side, a 2 ft. buffer with candle sticks, an 12 ft. lane in each direction, and a center 12 ft. two-way left-turn lane</td>
</tr>
</tbody>
</table>

**Preferred Alternative**

- B

Attach copies or provide information (title, date, etc.) regarding alternatives analysis, trade-offs comparison, or similar exercises that have been completed for this project, such as an ALTERNATIVES COMPARISON TABLE.

SEE ATTACHED ALTERNATIVES COMPARISON TABLE
Basis of Design
Example – SR 520 Montlake to Lake Washington

- Show what design element will be changing
- See DM Chapter 1105
- Column headers should be the project alignments
- Combine similar alignments (i.e. mainlines, ramps)
- Place a X on items you are affecting (or Yes, No, or N/A)
- Use the Design Parameters Worksheet to show dimensions & locations

<table>
<thead>
<tr>
<th>Design Element</th>
<th>Alignment #1- SR 999</th>
<th>Alignment #2</th>
<th>Alignment #3</th>
<th>Alignment #4</th>
<th>Alignment #5</th>
<th>Alignment #6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Lane</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Median / Buffer</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Shoulder</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Streetside / Roadside Zone</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Pedestrian Facility</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
BOD – Exemptions
Design Manual Chapter 1100.10(1)(a)(1) and Exhibit 1105-1

All Projects

• You can ask your ASDE for a BOD exemption if the only design elements changed are:
  – ADA
  – Clear Zone
  – Roadside Safety Hardware
  – Signing (replacing existing)
  – Delineation (replacing existing in same location)
  – Illumination
  – ITS
  – Signal Hardware
BOD – Exemptions

Design Manual Chapter 1100.10(1)(a)(2) and Chapter 1120.03

Preservation Projects
• BOD is not required if your only changing the following elements
  – Adjust existing features
    • i.e. monuments, catch basins, manhole covers
  – ADA
  – Cross Slope (Lane or Shoulder)
  – Vertical Clearance
  – Delineation
  – Barriers & Terminals
Safety Projects

• Programmatic projects endorsed by the WSDOT Highway Safety - Panel contact your ASDE for a possible exemption
  – i.e. Intersection Safety Improvement Program treatments, rumble strips, chevron signs, etc.
• Crash Analysis Report (CAR) may suffice for a BOD, contact your ASDE for a possible exemption
• New CARs will contain need and context therefore a BOD will not be required
BREAK TIME!
Design Approval

Contents

- Stamped Cover Sheet
- Design Approval Memorandum
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- Project Summary Documents
- Basis of Design
- Alternatives Comparison Table
- Design Parameter Worksheet
- Safety Analysis
- Design Analysis
- Known Variances
- Interchange and/or Intersection Plans
- Alignment Plans and Profiles
- Basis of Estimate
# Alternatives Comparison Table

**Use Baseline Need(s) from BOD**

**Use Contextual Need(s) from BOD**

- **Add any metrics & targets you will use to choose between alternatives here. These should also be listed in Section 1 of the Basis of Design.**

<table>
<thead>
<tr>
<th>ALTERNATIVE</th>
<th>Baseline Performance Metrics</th>
<th>Contextual Performance Metrics</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mode</td>
<td>Vehicles &amp; Bikes</td>
<td>Bikes</td>
</tr>
<tr>
<td></td>
<td>CN1 - Bike connectivity between M/F 1.0 and 1.32</td>
<td>CN2 - Similar or less risk of Fatal or Injury crashes</td>
<td>CN3 - LOS A</td>
</tr>
<tr>
<td>A - Retain Existing Channelization</td>
<td>++</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B - 5 ft. Bike lanes, an 11 ft. lane in each direction, and a center 12 ft. two-way left-turn lane</td>
<td>++</td>
<td></td>
<td>++</td>
</tr>
<tr>
<td>C - 4 ft. Bike lanes, 2 ft. buffers with candle sticks, an 11 ft. lane in each direction, and a center 10 ft. two-way left-turn lane</td>
<td>++</td>
<td></td>
<td>++</td>
</tr>
<tr>
<td>D - 6 ft. Bike lane on north side, a 2 ft. buffer with candle sticks, an 12 ft. lane in each direction, and a center 12 ft. two-way left-turn lane</td>
<td>++</td>
<td></td>
<td>++</td>
</tr>
</tbody>
</table>

**Performance Trade-Offs Discussion and Recommended Preferred Alternative**

+ The Bike Group preferred the 5ft. wide bike lanes with no buffer to the 4ft. wide bike lanes with a buffer.
+ Bike lanes will have less vehicle/bike crashes than no bike lanes.
+ Vehicles will move smoother with bike lanes than with bikes riding in the traffic lanes.
+ Candle sticks in buffers tend to be Maintenance nightmares.

**Ledged**

++ Very Good
+ Good
© Neutral
− Poor
−− Poorer
Alternatives Comparison Table

Example – I-90 WB Mercer Slough to W Lake Sammamish

Add any metrics & targets you will use to choose between alternatives here. These should also be listed in Section 1 of the Basis of Design

<table>
<thead>
<tr>
<th>ALTERNATIVE</th>
<th>Baseline Performance Metrics</th>
<th>Contextual Performance Metrics</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>A - Retain Existing Channelization</td>
<td>++</td>
<td>-</td>
<td>$1M</td>
</tr>
<tr>
<td>B - 5 ft. Bike lanes, an 11 ft. lane in each direction, and a center 12 ft. two-way left-turn lane</td>
<td>++</td>
<td>++ ++ ++</td>
<td>$1M</td>
</tr>
<tr>
<td>C - 4 ft. Bike lanes, 2 ft. buffers with candle sticks, an 11 ft. lane in each direction, and a center 10 ft. two-way left-turn lane</td>
<td>++</td>
<td>++ ++ ++</td>
<td>$1M + Maintenance of candle sticks</td>
</tr>
<tr>
<td>D - 6 ft. Bike lane on north side, a 2 ft. buffer with candle sticks, an 12 ft. lane in each direction, and a center 12 ft. two-way left-turn lane</td>
<td>++</td>
<td>+ + +</td>
<td>$1M + Maintenance of candle sticks</td>
</tr>
</tbody>
</table>

Performance Trade-Offs Discussion and Recommended Preferred Alternative

+ The Bike Group preferred the 5ft wide bike lanes with no buffer to the 4ft wide bike lanes with a buffer.
+ Bike lanes will have less vehicle/bike crashes than no bike lanes.
+ Vehicles will move smoother with bike lanes than with bikes riding in the traffic lanes.
+ Candle sticks in buffers tend to be Maintenance nightmares.

Legend
++ Very Good
+ Good
0 Neutral
- Poor
-- Poorest

An ACT can be scored in any way but, Don’t forget the all important legend

Alternatives Comparison Table may be found on the [ASDE website](#).
## Alternatives Comparison Table

### Example – SR 509 Completion Project

**Performance Category**

<table>
<thead>
<tr>
<th>Mode</th>
<th>Auto / Freight</th>
<th>HOV / BUS</th>
<th>Freight / Auto / Transit</th>
<th>Freight / Auto / Transit</th>
<th>Freight / Auto / Transit</th>
<th>Freight / Auto / Transit</th>
<th>Safety</th>
<th>Mobility</th>
<th>Env’t</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance Metric</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SR 509 Performance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>I-5 Performance</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delay</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Airport - Travel Time</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Airport - Travel Time Reliability</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Centers - Travel Time</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Centers - Travel Time Reliability</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Economic Benefit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local and Regional Comprehensive Plan</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safety</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Contextual Performance Metrics**

<table>
<thead>
<tr>
<th>Safety</th>
<th>Mobility</th>
<th>Env’t</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ped</td>
<td>Ped &amp; Bike</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Economic Vitality**

<table>
<thead>
<tr>
<th>Date: 6/8/16</th>
</tr>
</thead>
</table>

**Cost**

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Build</td>
<td>$710M</td>
</tr>
<tr>
<td>Scenario 1 - Closing the Gap</td>
<td>$860M</td>
</tr>
<tr>
<td>Scenario 3 - Moderate Connectivity</td>
<td>$880M</td>
</tr>
<tr>
<td>Scenario 4 - Full Connectivity</td>
<td>$1050M</td>
</tr>
<tr>
<td>Scenario 5 - Full-Build</td>
<td>$1880M</td>
</tr>
</tbody>
</table>

**Performance Trade-Offs Discussion and Recommended Preferred Scenario**

Alternatives Comparison Table may be found on the [ASDE website](http://www.asde.com).
Design Approval

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• Interchange and/or Intersection Plans
• Alignment Plans and Profiles
• Basis of Estimate
## Design Parameters Worksheet

<table>
<thead>
<tr>
<th>General Design Elements</th>
<th>Detailed Design Elements (Parameters)</th>
<th>Changed Elements See Note 1</th>
<th>Physical Feature/Location</th>
<th>Existing Dimension</th>
<th>Design Manual Dimension</th>
<th>Proposed Dimension</th>
<th>Reference/Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Lane</td>
<td>Number of Lanes</td>
<td>x</td>
<td>HWDX 15+85 to HWDX 25+81.23 ML 71+93.67 to ML 76+79.35</td>
<td>N/A (new DA Off-ramp)</td>
<td>1 lane</td>
<td></td>
<td>DM 1420.01 (Nov. 2015)</td>
</tr>
<tr>
<td></td>
<td>Lane Type</td>
<td>x</td>
<td>HWDX 15+85 to HWDX 25+81.23 ML 71+93.67 to ML 76+79.35</td>
<td>N/A (new DA Off-ramp)</td>
<td>Left-side direct access connection</td>
<td>DM 1420.01 (Nov. 2015)</td>
<td>DM 1420.01(3) (Nov. 2015)</td>
</tr>
<tr>
<td></td>
<td>Width Tangent Roadway</td>
<td>x</td>
<td>HWDX 15+85 to HWDX 25+81.23 ML 71+93.67 to ML 76+79.35</td>
<td>N/A (new DA Off-ramp)</td>
<td>12’</td>
<td>Varies 12’ to 14’</td>
<td>See Lane Width Table and See Design Analysis 1</td>
</tr>
<tr>
<td></td>
<td>Width Turning Roadway</td>
<td>x</td>
<td>HWDX 15+85 to HWDX 25+81.23 ML 71+93.67 to ML 76+79.35</td>
<td>N/A (new DA Off-ramp)</td>
<td>DM 1420.01 (Nov. 2015)</td>
<td></td>
<td>See Lane Width Table and Turning Roadway Width Table and see Design Analysis 1</td>
</tr>
<tr>
<td></td>
<td>Lane Reduction</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OTHER</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Notes
- Place an “X” here if you affect this element.
- Insert the location of the feature. Stations or MPs.
- List the Existing, Design Manual guidance and Proposed Dimensions.
- Reference DM Section or other Reference Notes.
Design Approval

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Safety Analysis Guide

• Will give direction on safety analysis by funding category (I1, I2, P1, P2, etc.)
• Will include a table that details:
  – What Triggers an Analysis
  – Study Area
  – Study Period
  – Scope of an Analysis
  – Methodology
  – Suggested Tools
  – Goals (What we are trying to accomplish by an analysis)
  – Documentation
## Crash Analysis Report vs. Safety Analysis

<table>
<thead>
<tr>
<th>Crash Analysis Report (CAR)</th>
<th>Safety Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crash Analysis Report (CAR)</td>
<td>Safety Analysis</td>
</tr>
<tr>
<td>Only required in I-2 safety projects</td>
<td>Required on other project types</td>
</tr>
</tbody>
</table>

A **CAR** has all 4 parts:
1. Describe the existing safety problem.
2. Determine the excess number of crashes.
3. Determine effective countermeasures
4. Compare alternatives to determine a preferred alternative.

A **Safety Analysis** has some of these but not all.

A **CAR** chooses a preferred alternative.

A **Safety Analysis** does not choose a preferred alternative.

A **CAR** needs to be stamped and signed.

A **Safety Analysis** does not need to be stamped and signed.
Crash Analysis Report (CAR)

- Done on I-2 projects
- Done during the scoping phase
- Approved by the I-2 Safety Panel
- Two CAR templates found online for the biennia 2017-2019 & 2020-2021
- Using the 2020-2021 CAR template replaces the need for a BOD.
Design Approval

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• Safety Analysis
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• Alignment Plans and Profiles
• Basis of Estimate
Design Analysis

Cover sheet example
- Choose Document Type
- Document Title
- Project Title
- Project Information
- Document Phase
- Signed and stamped by Engineer of Record
- 409 Disclaimer for Safety Analysis

Design Analysis form and example may be found on the ASDE website
Design Analysis
Design Analysis Description

Section 1: Background

Briefly describe the project:
The "SR 520, Montlake to Lake Washington I/C and Bridge Replacement" project will replace the existing earthquake vulnerable Union Bay Bridge (Br 520/6) and West Approach Bridge (Br 520/7.5) along with other associated major work. See Basis of Design for details.

Provide any background information important to understanding the decision(s):
The project will replace the existing Montlake Blvd E (SR 513) undercrossing and 24th Ave E undercrossing with a new community enhancement lid structure. Both the Montlake Blvd E and the 24th Ave E interchanges will be partially located on the new lid structure. Work included as part of the new lid will include the addition of two new HOV direct access ramps at the reconstructed 24th Ave E interchange, including an eastbound on-ramp (HDXE) and a westbound off-ramp (HWDX).

The two new HOV direct access ramps will be located within the SR 520 median and will provide a "drop ramp" type connection from the SR 520 HOV lanes to 24th Ave E and transit stops located on the Montlake lid structure. In addition to transit vehicles, the HOV direct access ramps will accommodate HOV 3+ vehicles.

Related documents (such as a Basis of Design):
The Basis of Design (BOD) and Alternatives Comparison Table (ACT) for the "SR 520, Montlake to Lake Washington I/C and Bridge Replacement" project (signed and approved on 7/14/2016) are attached.
## Design Analysis

### General Project Information

**Issues Description**

- Variance Reference ID #
- Design Element
- Location
- DM Guidance
- Proposed
- Appendix Sheet #

### Section 2: Issues Description

Describe the decision(s) that will be discussed. Identify the design elements that are involved, including the locations. Identify the proposed dimensions and how they compare to Design Manual Guidance.

<table>
<thead>
<tr>
<th>ID #</th>
<th>Design Element</th>
<th>Location</th>
<th>Guidance</th>
<th>Proposed</th>
<th>Shown on (Sheet #)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TW1</td>
<td>Traveled Way Width</td>
<td>HWDX 16+26.25 PC to HWDX 17+28.60 PCC</td>
<td>15 Ft.</td>
<td>14 Ft.</td>
<td>Appendix B, CH10 &amp; CH18</td>
</tr>
<tr>
<td>SW1</td>
<td>Inside Shoulder Width</td>
<td>HWDX 16+06.03 to HWDX 18+12.34 Rt</td>
<td>2 Ft.</td>
<td>Varies 1 to 2 Ft.</td>
<td>Appendix B, CH10, CH11 &amp; CH18</td>
</tr>
<tr>
<td>SW2</td>
<td>Outside Shoulder Width</td>
<td>HWDX 15+87 to HWDX 16+18 Lt</td>
<td>8 Ft.</td>
<td>Varies 1 to 8 Ft.</td>
<td>Appendix B, CH10 &amp; CH18</td>
</tr>
</tbody>
</table>

**Details:**
The subject Design Analysis documents dimensions for traveled way width (at turning roadway), shoulder widths and related geometric elements for the westbound SR 520 HOV direct access off-ramp at 24th Ave E (HWDX), as discussed below:
### Design Analysis

**Context, Background, History**

#### Section 2: Issues Description

**Traveled Way Width for Turning Roadway (TW1)** — The subject project will build a new westbound HOV direct access off-ramp and a new eastbound HOV direct access on-ramp at the reconfigured 24th Ave E interchange. For lane widths on HOV direct access ramps, Design Manual (DM) 1420.03(5)(a) [July 2016] instructs the designer to “use widths for separated roadway HOV facilities”, referencing the “Minimum Traveled Way Widths for Articulated Buses in Chapter 1410”, and per DM Exhibit 1410-1 [June 2009]. The westbound HOV direct access off-ramp (HWDX) includes one location where planned traveled way width will not meet the minimum width per DM Exhibit 1410-1. The portion of the off-ramp from HWDX 16+26.25 PC to HWDX 17+28.60 PCC is located within a horizontal curve with a 510-foot radius (496-foot radius measured at the outside edge of the traveled way). Per DM Exhibit 1410-1, the minimum traveled way width for a single-lane roadway with a 496-foot radius is 15 feet. The planned traveled way width through this horizontal curve location is 14 feet.

**Shoulder Width (SW1 & SW2).** Per DM 1420.03(5)(b) [July 2016], the minimum width for the sum of the two HOV direct access shoulders is 10 feet for one-lane ramps. The minimum width for one of the shoulders is 8 feet (for disabled vehicles) and the minimum width for the other shoulder is 2 feet. Additionally, it is noted that the wider shoulder may be on the left or the right, but the wide shoulder shall be maintained on the same side of the ramp throughout the ramp.

- **SW1.** The westbound HOV direct access off-ramp and the adjacent eastbound HOV direct access on-ramp can be considered a "two-way ramp" where the two ramps are separated by a narrow raised median (HWDX 16+06.03 to HWDX 19+33.17). The planned inside shoulder width for the westbound off-ramp (along the aforementioned raised median) varies from 1 foot to 4 feet. The portion of the off-ramp where the planned inside shoulder width would be less than 2 feet (per DM criteria) is located at the vicinity of the off-ramp terminal from HWDX 16+06.03 to HWDX 16+12.34.

- **SW2.** At the vicinity of the off-ramp terminal, the westbound HOV direct access off-ramp's outside shoulder will be reduced to one-foot at the vicinity of the off-ramp stop line (vicinity HWDX 16+87 to HWDX 16+18). The reduction in shoulder width at the vicinity of the off-ramp terminal is one measure that would help to discourage wrong way movements by providing a narrower throat width in accordance with DM 1310.02(10)(4) [Nov 2015].

If guidance other than the Design Manual was used describe it here

N/A
Design Analysis
Discussion of Methodology

- Discuss evaluation methodology
- Describe metrics / considerations used to pick preferred alternative.

Methodology for comparing design elements (Shoulder and ramp width)

Section 3: Options Evaluation and Decision

Discuss the evaluation methodology. Describe the metrics/considerations that will be used to choose between options. Describe methodology (quantitative or qualitative) and any performance targets. The performance metrics, methods and targets you choose will be part of your performance trade-offs “story”

Although the project’s Basis of Design included three baseline needs and six contextual needs; only two contextual needs were determined to be pertinent in evaluating between options including contextual needs CN4 to improve regional and local transit connectivity and operations and CN6 metric to improve sustainability. For the subject Design Analysis, a comparison of safety performance versus operational performance were the primary performance measures utilized in evaluating between options.

The methodology for comparing performance for each geometric element is described in more detail as follows:

- **Shoulder Width (SW1 & SW2) and Total Ramp Width (TR1)** – For evaluating inside shoulder width at the vicinity of the two-way ramp median (SW1), the outside shoulder width at the vicinity of the off-ramp terminal (SW2), and total ramp width at the vicinity of the off-ramp terminal (TR1), a qualitative approach that considers safety performance, operational / mobility performance, and functional needs has been utilized. For SW1, SW2 and TR1, contextual needs CN4 and CN5 were also utilized.
## Design Analysis
### Options Comparison Table

#### Section 3: Options Evaluation and Decision

<table>
<thead>
<tr>
<th>Options Comparison Table</th>
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</table>

<table>
<thead>
<tr>
<th>Issue and Location:</th>
</tr>
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<tbody>
<tr>
<td>Inside Shoulder Width (SW1) - HWDX 16+06.03 to HWDX 18+12.34 Rt; Outside Shoulder Width (SW2) – HWDX 15+87 to HWDX 16+18 Lt; and Total Ramp Width (TR1) – HWDX 15+87 to HWDX 16+10.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Metrics / Considerations</th>
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<tbody>
<tr>
<td>Safety Performance</td>
</tr>
<tr>
<td>Operational and Mobility Performance</td>
</tr>
<tr>
<td>CNT – Improve Regional Transit Connectivity and Operations</td>
</tr>
<tr>
<td>CN6 - Sustainability</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Options Evaluated ↓</th>
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</table>

<table>
<thead>
<tr>
<th>Full Standard Option Ramp Terminal Width 25' [2, 15, 8]</th>
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</thead>
<tbody>
<tr>
<td>SW1, SW2, TR1</td>
</tr>
<tr>
<td>Does not Provide Traffic Calming for Low Speed Context Change</td>
</tr>
<tr>
<td>A-BUS Fully Accommodated Including Ability for One A-BUS to Pass Another Stalled A-BUS for Entire Length of Off-Ramp</td>
</tr>
<tr>
<td>Improved Transit Connectivity and Operations</td>
</tr>
<tr>
<td>Area of Pavement Surface = 172 SF more than Narrower Width Option</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Narrower Width Option Ramp Terminal Width 16' [1,14,1]</th>
</tr>
</thead>
<tbody>
<tr>
<td>SW1, SW2, TR1</td>
</tr>
<tr>
<td>Provides Traffic Calming, Potentially Reduces Wrong Way Movements, and is Consistent with Low Speed Context</td>
</tr>
<tr>
<td>A-BUS Not Fully Accommodated Where One A-BUS is Not Able to Pass Another Stalled A-BUS at Off-Ramp Terminal Area</td>
</tr>
<tr>
<td>Slightly Reduced Transit Connectivity and Operations (Only When an A-BUS is Stalled at Vicinity of Off-Ramp Terminal)</td>
</tr>
<tr>
<td>Area of Pavement Surface = 172 SF less than Full Standard Option</td>
</tr>
</tbody>
</table>

Discuss the performance tradeoffs shown in the table, and compare the performance of the options:
Design Analysis
Detailed Description of Each Option

**Section 3: Options Evaluation and Decision**

**Detailed description of the options evaluated is as follows:**

The Full Standard Option provides a minimum 2-foot inside shoulder width and an 8-foot outside shoulder width for the full length of the westbound HOV direct access off-ramp including 15-foot traveled way width for the turning roadway at the horizontal curve at PI HWDX 16+77.60 (for a total roadway width of 25 feet) and 14-foot traveled way width for the remainder of the off-ramp (for a total roadway width of 24 feet). The Full Standard Option also provides the total ramp width necessary for one A-BUS to pass another stalled A-BUS for the full length of the off-ramp.

The Narrower Width Option reduces the inside and outside shoulder widths for a portion of the westbound HOV direct access off-ramp (as compared with the Full Standard Option). At the vicinity of the off-ramp terminal, the Narrower Width Option includes an inside shoulder that is 1-foot wide from HWDX 16+06.03 to HWDX 17+50.74 Rt. and an inside shoulder that varies from 1 to 2 feet from HWDX 17+50.74 to HWDX 18+12.34 Rt. (Associated Issue SW1). The remainder of the off-ramp will provide a minimum 2-foot inside shoulder width. The Narrower Width Option also reduces the outside shoulder width from 8 feet to 1-foot from HWDX 15+87 to HWDX 16+18 Lt. (Associated Issue SW2), maintaining an 8-foot outside shoulder width for the remainder of the off-ramp. Additionally, the Narrower Width Option maintains a 14-foot traveled way width for the full length of the off-ramp (for 16-foot total roadway width at vicinity of off-ramp terminal and a minimum 24-foot total roadway width for majority of the remaining off-ramp).
Design Analysis
Performance Comparison and Tradeoffs

The Options Comparison Table above combines three associated issues (SW1, SW2 & TR1) due to their intertwined performance and tradeoff comparison. Although this Design Analysis compares and evaluates tradeoffs for Contextual Need CN4 (Improve Regional and Local Transit Connectivity and Operations) and Contextual Need CN6 (Sustainability), the primary tradeoffs are between Safety Performance versus Operational and Mobility Performance. More specifically, associated issues SW1 and SW2 both reduce the inside and outside shoulder widths (respectively) at the vicinity of the HOV direct access off-ramp terminal. The reduced shoulder widths provide safety performance benefits that are described in greater detail below. Conversely, the reduced shoulder widths will limit the ability of one A-BUS to pass another stalled A-BUS thereby reducing the off-ramp's operational performance in the event of a breakdown or other disabling event. Additional evaluation of tradeoffs is provided as follows:
Design Analysis
Performance of Safety

Section 3: Options Evaluation and Decision

Safety Performance – This performance metric is evaluated for shoulder width at the vicinity of the off-ramp terminal for two safety related elements: 1) traffic calming treatments; and 2) reduction in potential for wrong way movements.

Under the Narrower Width Option, Associated Issues SW1 and SW2 both propose to reduce the inside and outside shoulders to 1-foot at the vicinity of the off-ramp terminal. As part of coordination efforts with the City of Seattle and WSDOT’s Northwest Region Traffic Office, it was requested that a “bulb out” be provided along the outside shoulder at the vicinity of the off-ramp terminal as a traffic calming treatment and for reducing wrong way movements. Providing narrower lane and shoulder widths can be used to influence driver comfort, thereby encouraging drivers to reduce their operating speed. Drivers exiting the westbound HOV direct access off-ramp will be leaving the freeway and entering onto low speed (25 mph) city streets. The narrowing of shoulders at the off-ramp terminal will increase the driver’s awareness of the contextual change from urban freeway to low-speed city street.

1. The reduction of the inside and outside shoulder widths at the vicinity of the off-ramp also provides an additional safety benefit. Per DM 1310.02(10)(4) [Nov 2015], narrowing the off-ramp throat width is one measure that can reduce the potential for wrong way movements when the terminals for on- and off-ramps are adjacent to each other. By reducing the inside and outside shoulder widths to one-foot at the vicinity of the off-ramp terminal, along with a slightly narrower turning roadway width (described previously as Associated Issue TW1), the off-ramp throat width is reduced by a total of 9 feet (from 25 feet per the Full Standard Option to 16 feet in the Narrower Width Option), thus meeting the intended objective of traffic calming, contextual change, and reduced wrong way movements.

In summary, safety performance is considered to be enhanced under the Narrower Width Option over the Full Standard Option.
Operational and Mobility Performance – This performance metric is evaluated for operational and functional needs of the shoulder in order to provide the width for disabled vehicles and support maintenance functions. For HOV direct access ramps, this performance metric is also evaluated for the ramp’s ability to allow one articulated bus (A-BUS) to pass another stalled A-BUS.

With the exception of the terminal portion of the HOV direct access off-ramp, the Full Standard Option and the Narrower Width Option both provide minimum 2-foot inside shoulders and 8-foot outside shoulders. The 8-foot outside shoulder will provide the following operational and functional benefits:

- Vehicles involved in crashes have a shoulder wide enough for vehicles to move out of the traveled way, thereby reducing the potential for secondary crashes. Similarly, vehicle breakdowns also have adequate shoulder width available to move out of the traveled way. The opportunity to move vehicle breakdowns and crashes out of the traveled way improves operational performance by minimizing the potential for traffic backups that might otherwise occur under conditions with narrower shoulders. It should also be noted that SR 520 utilizes Incident Response Team (IRT) vehicles to assist disabled vehicles. The 8-foot outside shoulder provides a location where the IRT can push disabled vehicles out of the traveled way.

- The 8-foot outside shoulder better allows WSDOT maintenance forces to perform routine maintenance activities without having to close the off-ramp or portions of the off-ramp.

- The 8-foot outside shoulder better allows the Washington State Patrol (WSP) to perform driver assistance and enforcement activities.
Design Analysis
Performance of CN4

Section 3: Options Evaluation and Decision

**CN4 – Improve Regional and Local Transit Connectivity and Operations** – This performance metric is evaluated for accommodation of transit vehicles. The westbound HOV direct access off-ramp, along with the eastbound HOV direct access on-ramp, and transit facilities planned for the Montlake lid surface, will make significant improvement towards meeting the target for CN4. Added HOV lanes along mainline SR 520 will also significantly improve transit connectivity and operations. Both options evaluated would provide a new westbound HOV direct access off-ramp that would be restricted to transit and HOV vehicles only. In terms of Associated Issues SW1, SW2 and TR1, the narrowed shoulder widths at the vicinity of the off-ramp terminal (per the Narrower Width Option) would perform slightly below the Full Standard Option, but only during a blocking event where a transit or HOV vehicle breakdown could not be moved out of the traveled way. For the reasons listed, the Full Standard Option has been rated as “improved transit connectivity and operations”, whereas the Narrower Width Option has been rated as “slightly reduced transit connectivity and operations”.
**Design Analysis**

Performance of CN6

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**Section 3: Options Evaluation and Decision**

**CN6 – Sustainability** - This performance metric is evaluated for maximum reduction, reuse, and/or recycling of construction materials associated with the shoulder width at the vicinity of the HOV direct access off-ramp terminal. The two options evaluated would use a slightly different amount of construction materials that is related to the pavement surface area for each option. The Full Standard Option would require a slightly larger footprint (172 SF larger) as compared with the Narrower Width Option, and therefore would require slightly more use of construction materials. In terms of CN6, the Narrower Width Option would perform the best of the options considered.
Discuss any mitigating measures added to address performance trade-offs:

SR 520 employs an Active Traffic Management System (ATMS) including variable message signs that can be used to notify drivers of any unanticipated blockages of the HOV direct access off-ramp as well as providing guidance to drivers regarding temporary detours. Transit agencies are also capable of communicating with drivers as might be needed to re-route subsequent transit vehicles as well as for coordinating removal of any transit vehicle breakdowns or blockages. WSDOT also utilizes an Incident Response Team (IRT) along SR 520 to assist disabled vehicles during peak commuting periods.

The outside shoulder width reduction, or “bulb out”, at the vicinity of the HOV direct access off-ramp terminal (Associated Issue SW2) will be built with a mountable curb and truck apron surface. As such, in the event of a breakdown event at the vicinity of the off-ramp terminal, emergency vehicles will typically be able to bypass a blocking incident by traversing over the “bulb out”.

The subject project will also require that all final configuration edge lines be applied with profiled methyl-methacrylate pavement markings. The methyl-methacrylate marking material will provide a durable and highly visible edge line marking to better assist drivers during hours of darkness and inclement weather. The profiled edge line will also provide a “rumble strip” effect that will better alert drivers of the edge of travelled way. The HOV direct access off-ramp will also be illuminated during hours of darkness.
Preferred option and reasoning for selecting the preferred option:

The selection of the Narrower Width Option can be summarized as providing greater safety performance while trading off slightly reduced operational performance at the ramp terminal. The Narrower Width Option to reduce shoulder widths and not increase traveled way width at turning roadways at the vicinity of the off-ramp terminal was selected as it will benefit safety performance by narrowing the HOV direct access off-ramp’s throat width and, subsequently reducing the potential for wrong way movements and encouraging reduced operating speeds. Although, the narrower shoulder widths and narrower traveled way width at turning roadways (both at the vicinity of the off-ramp terminal) will slightly reduce operational or mobility performance for transit or HOV vehicles, the benefits of the enhanced safety performance are considered to outweigh reduced operations during rare vehicle breakdown occasions. In terms of the project’s contextual needs, the Narrower Width Option will improve regional and local transit connectivity and operations in accordance with CN4 and will also slightly reduce the off-ramp footprint and amount of construction materials needed in accordance with CN6 (as compared with the Full Standard Option).
Design Analysis
Section 4: Attachments

<table>
<thead>
<tr>
<th>Section 4: Attachments</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Vicinity Map</td>
</tr>
<tr>
<td>□ Basis of Design</td>
</tr>
<tr>
<td>□ Alternatives Comparison Table</td>
</tr>
<tr>
<td>□ Appendix A – Quantitative Analysis</td>
</tr>
<tr>
<td>□ Appendix B – Alignment and Channelization Plans (w/HSM segments delineated)</td>
</tr>
<tr>
<td>□ Appendix C – Auto-Turn Exhibits</td>
</tr>
</tbody>
</table>
Design Analysis

Section 5 Approvals

Design Decisions approved by Project Engineer. See WSDOT Design Manual Chapter 300 and required approvals for Design Analysis.

Design Analysis Approvals: ☑ WSDOT Region / ☑ WSDOT HQ / ☑ FHWA

Design Decision / Design Analysis - Recommended for Approval:
- Signed: Phil Mervall
- Print: Phil Mervall
- Date: 08/16/17
- SR 520 Project Engineer Staff

Design Decision Approval / Design Analysis Recommended for Approval:
- Signed: Daniel Magleby
- Print: Daniel Magleby
- Date: 09/01/17
- SR 520 Project Engineer

Design Analysis Approval:
- Signed: Christian Frutiger
- Print: Dawn Yankeirken
- Date: 09/03/17
- SR 520 Engineering Manager

Design Analysis Approval:
- Signed: [Signature]
- Print: Ricky Bhalla
- Date: 09/18/17
- WSDOT HQ

Design Analysis Approval:
- Signed: [Signature]
- Print: Jeffrey L. Horton
- Date: 10/5/17
- FHWA

Check needed Approvals
- Engineer of Record
- Project Engineer
- Engineering Manager
- WSDOT HQ ASDE
- FHWA Area Engineer

Design Analysis form and example may be found on the ASDE website
Design Approval

Contents

• Stamped Cover Sheet
• Design Approval Memorandum
• Vicinity Map
• Project Summary Documents
• Basis of Design
• Alternatives Comparison Table
• Design Parameter Worksheet
• Crash Analysis Report
• Design Analysis
• Known Variances
• Interchange and/or Intersection Plans
• Alignment Plans, Profiles, & Roadway Sections
• Basis of Estimate
List of Known Variances

- The Design Variance Inventory (DVIS) is discontinued.
- Contact your Liaison/ASDE for a list of known variances
  - Give them the SR # and SRMP to SRMP
- A Design Variance is a:
  - Design Analysis
  - Maximum Extent Feasible
- FHWA Stewardship and Oversight Agreement requires logging and reporting design variances
- All variances must be sent to ASDE/Liaison when approved
- Variances will be logged by the Liaisons/ASDE
Design Approval

Contents

• Stamped Cover Sheet
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• Alignment Plans, Profiles, & Roadway Sections
• Basis of Estimate
Design Documentation
Project Development Approval
Design Documentation Package

Design Approval
- Stamped Cover Sheet
- Project Description Memo
- Vicinity Map
- Project Summary Documents
- Basis of Design
- Alternatives Comparison Table
- Design Parameter Worksheet
- Safety Analysis
- Design Analysis
- List of Known Variances
- Interchange and/or Intersection Plans
- Alignment Plans and Profiles
- Basis of Estimate

Project Development Approval
- All Updated Items from Design Approval plus
- NEPA Approvals
- SEPA Approvals

Project File (items may be necessary for advertisement but not retained for 75 years)
- Maximum Extent Feasible
- Intersection Control Analysis
- Roundabout Geometric Design
- Signal Permit
- Median Crossover Approval
- Traffic Analysis
- Fencing
- Additional Illumination
- ITS System Engineering Docs
- Barrier Length of Need Calcs
- Public Art Plan
- Justifications
- Approvals
Project Development Approval

- Project Development Approval (PDA) is granted after all project development documents are completed and approved.
- The PDA contains any updated Design Approval items plus the following:

<table>
<thead>
<tr>
<th>Description</th>
<th>DM Ref.</th>
<th>Comments</th>
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</thead>
<tbody>
<tr>
<td><strong>PROJECT DEVELOPMENT APPROVAL DOCUMENTS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stamped Cover Sheet*</td>
<td>300</td>
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<td>Project Development Approval Memo</td>
<td>300</td>
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<td>Vicinity Map</td>
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<tr>
<td>Any Design Approval items that have been revised or updated</td>
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<td></td>
</tr>
</tbody>
</table>

* Include Original
Updated Design Approval Documents

• If any of the Design Approval (DA) documents (listed below) have been changed, provide an updated document in the PDA.
  – Basis of Design
  – Alternatives Comparison Table
  – Design Parameters Worksheet
  – Crash Analysis Report or Crash Analysis
  – Design Analysis
  – List of Known Variances
  – Interchange and/or Intersection Plans
  – Basis of Estimate with Cost Estimate

• If an item has not changed, you may simply reference the DA version of the document or include a copy of it in the PDA.

• Shelf life of signed PDA is three years
Project Descriptions Memo

A Word template for the Project Descriptions Memo can be found on the ASDE website:

http://www.wsdot.wa.gov/publications/fulltext/design/ASDE/PDA_Memo.docx

- You must have an engineer’s stamp and PDE approval on the document
- A reader-friendly memorandum that describes the project
Project Descriptions Memo

• Treat the memorandum like an executive summary
• If there are unique issues associated with this project, describe them
• If change management happened on this project, explain what happened and why
• Some project documents are not included in the PDA. Document where these documents are located in this memorandum.
  – Examples of these documents are:
    • Right of way plans: Changes initiated by the project
    • Interchange Justification Reports
    • Limited access acquisition and the public hearings
    • Agreements
• If the PDA is a combined Design Approval and Project Development Approval (DA & PDA), use this memorandum to explain why they were combined.
PDA Cover Sheet

Project Development Approval

SR XXX, Project Title
MP TO MP

XL- PIN-

Month, Year

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

XXXX Region

XXXX, Washington

Name, PE
Project Engineer

PE Stamp

Project Development Approval:

By __________________

Engineering Manager

Date __________________

Engineering Manager Sign & Date

SR Number and Project Title
Mile Post to Mile Post
XL Number and PIN Number
Month and Year
Region Name
Name of Engineer of Record
Stamped & Signed

October 2016
NEPA Approvals

• The following NEPA document must be included:
  – Draft and Final Environmental Impact Statement (EIS) and Record of Decision (ROD), or
  – Environmental Assessment (EA) and Finding of No Significant Impact (FONSI), or
  – Categorical Exempt (CE) Documentation
    • Signed Environmental Classification Summary, or
    • Memorandum excluding the project from CE, or
    • CE Checklist
• The above documents must be a signed original
SEPA Approvals

• The following SEPA document must be included:
  – Draft and Final EIS, or
  – Determination of Non-Significance and Checklist, or
  – Categorical Exempt (CE) Documentation
    • Signed Environmental Classification Summary, or
    • Memorandum excluding the project from CE, or
• The above documents must be a signed original
Design Build Projects

- Design-Build projects are required to meet the documentation requirements of the Design Manual
- Design Approval is required prior to Request for Proposal (RFP)
- Design-Build projects are usually more complex than ‘standard’ WSDOT projects therefore they will have a more complex PDA that will be detailed in the Request for Proposal (RFP)
- In all Design-Build projects, the PDA is required prior to project completion
Design Documentation
Project File
Design Documentation Package

**Design Approval**
- Stamped Cover Sheet
- Project Description Memo
- Vicinity Map
- Project Summary Documents
- Basis of Design
- Alternatives Comparison Table
- Design Parameter Worksheet
- Safety Analysis
- Design Analysis
- List of Known Variances
- Interchange and/or Intersection Plans
- Alignment Plans and Profiles
- Basis of Estimate

**Project Development Approval**
- All Updated Items from Design Approval plus
- NEPA Approvals
- SEPA Approvals

**Design Documentation Package**
- Maximum Extent Feasible
- Intersection Control Analysis
- Roundabout Geometric Design
- Signal Permit
- Median Crossover Approval
- Traffic Analysis
- Fencing
- Additional Illumination
- ITS System Engineering Docs
- Barrier Length of Need Calcs
- Public Art Plan
- Justifications
- Approvals

*Project File (items may be necessary for advertisement but not retained for 75 years)*
The Project File includes the Design Documentation Package (DDP) and other documentation from:

- Planning
- Scoping
- Program Management
- Traffic
- Utilities
- Maintenance
- Local Agency
- Backup Calculations
- Materials
- Geotech
- Bridge
- Real Estate Services
- Advertisement and award
- Construction
- Environmental
Project File

The Project File checklist is a list of documents other than DDP Documents:

http://www.wsdot.wa.gov/publications/fulltext/design/ASDE/Proj_File_Checklist.docx

WSDOT Project File Checklist

These are Project File (PF) items that are not retained long term in the Design Documentation Package. See Design Manual 300.03(3) for further information regarding the PF.

References listed below are Design Manual chapters unless otherwise noted (see Reference notes.)

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This column is a place for you to help future readers understand what is in the project file.

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Project File

The Project File is:

Scalable:
• Delete things from the list that are not in your project

Not all inclusive:
• Add anything to the list that is unique to your project

A Tool to help construction understand:
• What is included in the project file
• Why it is included in the project file
Project File

Retention Policies

• All Project File documents should be purged **3 Years** after Final Contract Voucher Certification

• DDP items are kept for 75 years
Design Documentation
Process Review
Process Review

**What** - Review of region project development and PS&E processes

**Why** - To provide reasonable assurance that projects meet established policies and procedures

**Who** - WSDOT (ASDE & PDE), FHWA (Area Engineer), or a combination of both

**When** - Periodically
Design & PS&E Process Review

Focus Areas

• Determined jointly by WSDOT & FHWA

What could be Reviewed?

• Design Documentation Package Checklist
• Basis of Design
• Design Parameters
• PS&E Review Process

When is it Reviewed?

• Projects generally selected after contract award
WSDOT/FHWA Review Outline

Initial Meeting

- Notify Region PDE on projects selected for review
- Discuss review objectives with Project Team
- Identify focus areas
- Understand documentation status, location, and file structure
Documentation Review

• Review Design Documentation
  - DDP Checklist Items
  - Basis of Design
  - Design Parameters
  - Other identified focus areas

• PS&E Documents

• Ask questions and clarify any issues of concern

• Provide informal feedback and discuss any findings
WSDOT/FHWA Review (Cont.)

Review Report and Feedback

• Draft report is prepared and sent to region for comments & input
• If a discrepancy is identified, region to report steps for mitigation
• Report is completed and finalized
• Recommendations are forwarded to region for implementation
WSDOT/FHWA Design Stewardship Review

**FEDERAL PROJECT No.**

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<th>NH-0101(307)</th>
<th>BR-0101(331)</th>
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**REVIEW TEAM**

Dean Moberg, FHWA Area Engineer
Mike Fleming, WSDOT Assistant State Design Engineer
Kent Kallsch, WSDOT Design Liaison

**DATE OF REVIEW**

3/8/2011

**PROJECT DESCRIPTION**

US-101 Shore Road to Kitchen-Dick Road Widening:

The Shore Road to Kitchen-Dick Road project widens US 101 from MP 256.91 to MP 260.38, an area located between Sequim and Port Angeles, in Clallam County. The existing facility within the project limits is a two-lane undivided highway. This project will widen the roadway section to four lanes with an unpaved median; it will revise the intersections with County Roads to restrict access and improve safety; replace the existing bridge at McDonald Creek; and, construct a second new parallel structure. Other work includes construction of retaining walls, a pedestrian path under-crossing, intersection improvements, drainage facilities, and landscaping.

**Project Notes:**

This project is one of three that constitute the “west half” of the projects described in the 1993 SEPA FEIS titled ‘US 101 O’Brien Road to Palo Alto Road.’ The project NEPA EA was signed by Dean W. Moberg on 1/31/2011. This project is the last remaining two-lane section on US 101 between Sequim and Port Angeles.

Design is near 60% completion. The design is refined to that level in the computer, but there was not a 60% PS&E review package for review. This is consistent with current practice, using electronic media rather than hard copy plans to solicit review and receive comments upon projects in development. For example, Clallam County Transit has had the opportunity to review the project electronically and has commented upon the design, but issues brought forward by the County, and the Transit organization, are yet to be factored into the acceleration and deceleration design for those bus stops. Inclusion of those comments will occur as the project continues to move toward completion.

**PROJECT COST**

PE: $7,082,695.
ROW: $18,209,064.
Const: $91,260,809.

All amounts as of 2/1/2011.
**OBSERVATIONS**  
*(add cells as necessary)*

| Observation: | US 101/Kitchen-Dick Road intersection WB to NB leg is designed with a WB-50 design vehicle rather than the WSDOT Design Manual 1340.05 guidance SU/Bus design vehicle without supporting documentation as to why that decision was made. Discussion with the design team provided the information that “any time you visit the site you will observe WB-50 vehicles making the WB to NB movement, so that was the selected design vehicle.” |
| Design Manual Requirement: | |
| Recommendation: | When going beyond guidance, the reason should be documented along with the action. |
| Resolution: | The design team will clarify why the WB-50 design vehicle was used and document those reasons in the DDP. |
| Responsible Person: | Jeff Loescher |
| Target Date: | 3/15/2011 |
| Resolution Date: | |
| Follow up phone call on 3/30/2011 provided closure that this was done. |

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**Roadside Safety Focus Area**  
*(add cells as necessary)*

1. **Describe roadside safety features incorporated in the project (if any):** Clear zone, slopes, stopping sight distance on existing roadway.

   This project addresses all of the above, and the project scope improves each to the extent feasible.

2. **Describe roadside safety features not addressed by the project and explain why not:** slopes not laid back where private impacts were too severe, or wetland impacts were too severe.

   Design decisions to provide traversable slopes to avoid severe property and wetland impacts are included in the DDP, approval methods and levels are according to WSDOT Design Manual guidance.