Design Documentation

Course Introduction

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December 2019

Roger Millar, Secretary of Transportation

Keith Metcalf, Deputy Secretary of Transportation

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

Course Outline

This training will cover:

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

Class Goals and Objectives

After taking this course, you should understand:

- Why we document
- 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?

- Demonstrate practical & logical decision making
- Consistency
  - Inconsistency can quickly establish a breach
  - If a particular document (decision process) is missing then there is a gap in telling our design story
  - 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 Document?

- Mitigate Liability Risk
  - Washington State is a Joint and Several state
  - Washington State has no cap on the value of liability damages in a civil lawsuit
  - It is easier to defend a well documented decision than a good decision without documentation

Why Do We Set Expectations for Documentation?

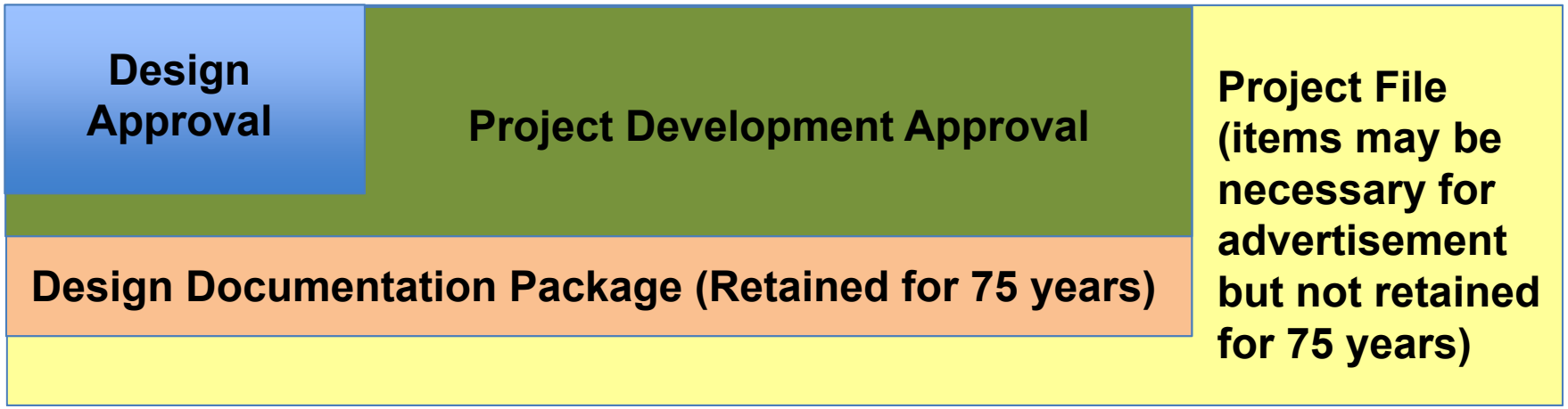
Most Importantly it captures:

What you did and why you did it?

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

Design Documentation Package

- Maximum Extent Feasible
- Intersection Control Evaluation
- 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

Contents

- Stamped Cover Sheet
- Project Description Memo
- Vicinity Map
- Project Summary Documents
- Basis of Design
- Alternatives Comparison Table
- Design Parameter Worksheet
- Crash Analysis Report
- Design Analysis
- Design Variance Inventory System Form
- Interchange and/or Intersection Plans
- Alignment Plans and Profiles
- Basis of Estimate

Design Approval

Description	DM Ref.	Comments
DESIGN APPROVAL DOCUMENTS		
Stamped Cover Sheet *	300.04(1)	
Design Approval Memorandum Describing the Project	300.04(1)	
Project Vicinity Map	PPM 400.06(4)	
Project Summary Documents Project Definition, Project Change Requests, (Contact your ASDE for list)	300.06(1) 1510.5(2)	
Interchange and/or Intersection Plans See region Channelization Plan Checklist	1360.07 1310.07(2),	
Alignment Plans and Profiles If significantly modified	300.04(1), 1210.06, 1220.06	
Basis of Estimate (BOE) with Cost Estimate Compare to budget	300.06(3)	

See handout and online at [WSDOT - Design Support]

Project Development Approval

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

PROJECT DEVELOPMENT APPROVAL DOCUMENTS		
Stamped Cover Sheet*	300.04(2)	
Project Development Approval Memorandum Describing the Project	300.04(2)	
Project Vicinity Map	PPM 400.06(4)	
Any Design Approval items listed above that have been revised or added	300.04(1)	
NEPA Approvals	300.02(1), 300.06(1)(b)	
SEPA Approvals	300.02(1), 300.06(1)(b)	

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.		
Description	**DM Ref.**	**Comments**
Maximum Extent Feasible *	1510.05(1)	
Intersection Control Evaluation (ICE)*	321.05(2), 1300.05(1)	
Roundabout Geometric Design Report*	1330.02(1)	
Signals Permit	1510.05(1)	
Pedestrian Facilities	1510	
Value Engineering Recommendation Approval Form	310.03(1)	
Justifications (Subjects range throughout the DM)	Multi	
Approvals (Subjects range throughout the DM)	Multi	

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

Project Type	Basis of Design (BOD) Approval	Design Analysis Approval [1] [2] [11]	Design Approval and Project Development Approval

See handout

Approval Authorities

Design Manual Exhibit 300-2

Item	Approval Authority		
	Region	HQ	FHWA
Program Development			
Work Order Authorization		X	X [1]
Public Hearings			
Corridor Hearing Summary		X [2]	
Design Hearing Summary		X [3]	X[8]
Limited Access Hearing Plan		X [4]	
Limited Access Findings and Order		X [5]	
Environmental Document			
Class I NEPA (EIS)		[7]	X
SEPA (EIS)		X	
Class II NEPA – Categorical Exclusion (CE) Documented in ECS form	X		
SEPA – Categorical Exemption (CE)	X		
Class III NEPA – Environmental Assessment (EA)		[7]	X
SEPA Environmental Checklist & Determination of Non-Significance (DNS)	X		
Design			
Basis of Design (BOD)	[9]	[9]	[9]
Intersection Control Type	X [22]	X [24]	
Experimental Features		X	X
Environmental Review Summary	X		
Final Project Definition		X [10]	
Interstate Interchange Justification Report		[7]	X
Any Break in Interstate Limited Access		[7]	X
Non-Interstate Interchange Justification Report		X	
Break in Partial or Modified Limited Access		X	
Intersection or Channelization Plans	X [11]		
Right of Way Plans	[12]	X	
Monumentation Map	X		
Materials Source Report		X [13]	
Pavement Determination Report		X [13]	
Roundabout Geometric Design (see Chapter 1320 for guidance)	X		
Resurfacing Report		X [13]	
Signal Permits	X [14]		
Geotechnical Report		X [13]	
Tied Bids	X [15]		

Item	Approval Authority		
	Region	HQ	FHWA
Bridge Design Plans (Bridge Layout)	X	X	
Preliminary Bridge Plans for Unusual/Complex Bridges on the Interstate		[7]	X
Structures Requiring TS&Ls		X	
Hydraulic Report	X [16]	[16]	
Preliminary Signalization Plans		X [6][20]	
Signalization Plans	X [22]		
Illumination Plans	X [22]		
Intelligent Transportation System (ITS) Plans	X [22]		
ITS Systems Engineering Analysis Worksheet (Exhibit 1050-2)	X [22]		
Rest Area Plans		X	
Roadside Restoration Plans	X [18]	X [19]	
Planting Plans	X [18]	X [19]	
Grading Plans	X		
Continuous Illumination – Main Line		X [20]	
Tunnel Illumination		X [20]	
High Mast Illumination		X [20]	
Project Change Request Form	X [21]	X [21]	
Work Zone Transportation Management Plan/Traffic Control Plan	X [22]		
Public Art Plan – Interstate (see Chapter 950)	X [18]	X [19][23]	X
Public Art Plan – Non-Interstate (see Chapter 950)	X [18]	X [19][23]	
ADA Maximum Extent Feasible Document (see Chapter 1510)	X	X	

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 Right of Way Plans Manager.
[5] Refer to Chapter 210 for approval requirements.
[6] Final review & concurrence required at the region 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 the FHWA for federal approval. (See Chapter 210.)
[9] See Exhibit 300-1 for BOD Approvals.
[10] Approved by HQ Capital Program Development and Management (CPDM).
[11] Include channelization details.
[12] Certified by the responsible professional licensee.
[13] Submit to HQ Mats Lab for review and approval.
[14] Approved by Regional Administrator or designee.
[15] Per 23 CFR 635.111.
[16] See the *Hydraulics Manual* for approvals levels.
[18] Applies to regions with a Landscape Architect.
[19] Applies to regions without a Landscape Architect.
[20] Approved by State Traffic Engineer.
[21] Consult CPDM for clarification on approval authority.
[22] Region Traffic Engineer or designee.
[23] The State Bridge and Structures Architect reviews and approves the public art plan (see Chapter 950 for further details on approvals).
[24] State Traffic Engineer or designee.

See handout

Definitions

- ***design up:*** An approach to developing project alternatives utilizing the smallest dimension that meet the need by providing the desired performance. [see DM 1106.04]
- ***minimum:*** the least dimension allowed without an approved design analysis.
- ***maximum:*** the greatest 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.

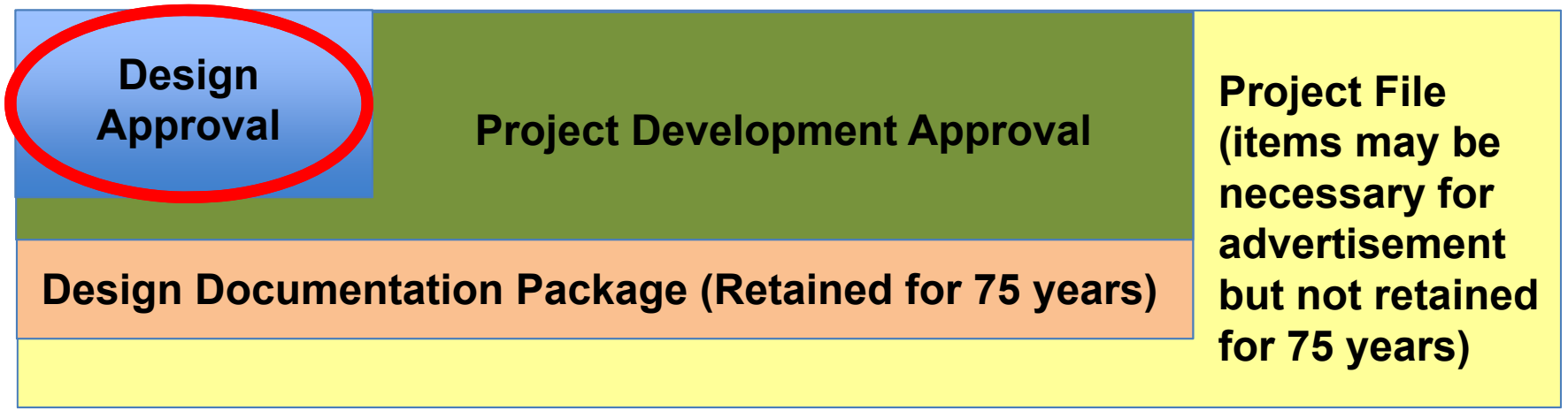
- ***document*** (verb): The act of including a short note to the DDP that explains a design decision.

- ***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. Use design decision template.

Design Documentation

Design Approval

Design Documentation Package



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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

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Stamped Cover Sheet

Design and Project Development Approval
I-405 –NE 30th St & NE 44th St Ramp Improvement Project
SR 405 MP 6.48 to MP 6.84

XL-4653 PIN-16A801

July 2016

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
Northwest Region
Seattle, Washington

Joe Przychodzen, PE
Project Engineer

Washington State Department of Transportation

JOSEPH PRZYCHODZEN STATE OF WASHINGTON 34442 REGISTERED PROFESSIONAL ENGINEER
8-2-2016

Approval Signatures	
Engineer of Record Joe Przychodzen, P.E	7-28-16 Date
Engineering Manager Lisa Hodgson, P.E.	7/28/16 Date
HEADQUARTERS Assistant State Design Engineer Greg Lippincott, P.E.	8/2/16 Date
FHWA Lindsey Handel, P.E.	8/2/16 Date

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

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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
  - Access Revision Reports (ARR)
  - Limited access acquisition and public hearings
  - Agreements
- Design Approval Memorandum template is online

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- Basis of Estimate

Project Summary - Changes

PROJECT SUMMARY

CURRENT

Stored in FileMaker Pro

CONTAINS

Project Definition
Design Decision Summary/BOD
Environmental Review Summary

FUTURE

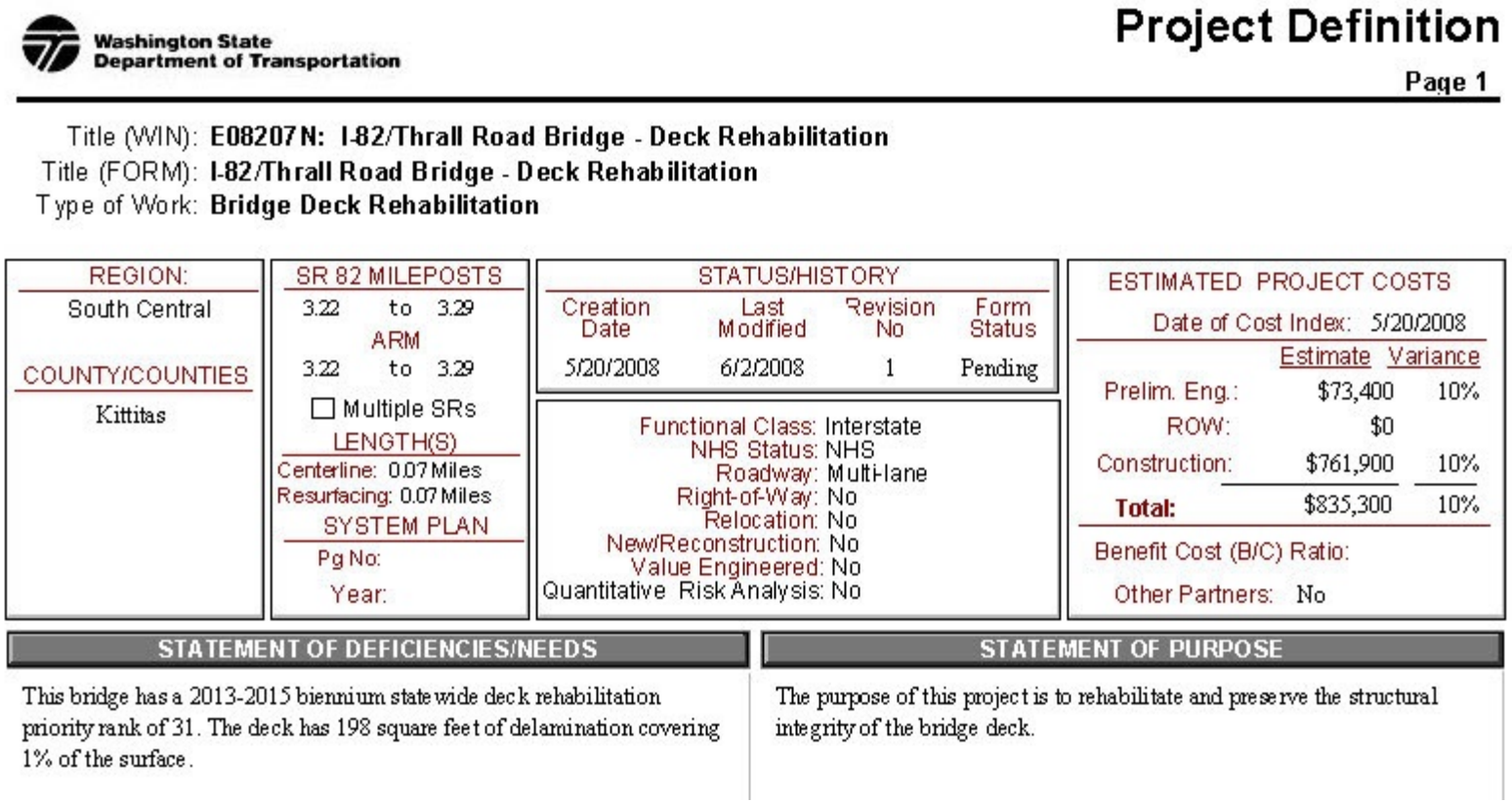
Stored in TEIS (Transportation Executive Information System)

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



Washington State Department of Transportation

Project Definition

Page 1

Title (WIN): **E08207N: I-82/Thrall Road Bridge - Deck Rehabilitation**
Title (FORM): **I-82/Thrall Road Bridge - Deck Rehabilitation**
Type of Work: **Bridge Deck Rehabilitation**

REGION:	SR 82 MILEPOSTS	STATUS/HISTORY	ESTIMATED PROJECT COSTS
South Central	3.22 to 3.29 ARM 3.22 to 3.29	Creation Date: 5/20/2008	Date of Cost Index: 5/20/2008
COUNTY/COUNTIES	☐ Multiple SRs	Last Modified: 6/2/2008	Estimate / Variance
Kittitas	LENGTH(S)	Revision No: 1	Prelim. Eng.: $73,400 10%
	Centerline: 0.07 Miles	Form Status: Pending	ROW: $0
	Resurfacing: 0.07 Miles	Functional Class: Interstate	Construction: $761,900 10%
	SYSTEM PLAN	NHS Status: NHS	**Total:** $835,300 10%
	Pg No:	Roadway: Multi-lane	Benefit Cost (B/C) Ratio:
	Year:	Right-of-Way: No	Other Partners: No
		Relocation: No	
		New/Reconstruction: No	
		Value Engineered: No	
		Quantitative Risk Analysis: No	

STATEMENT OF DEFICIENCIES/NEEDS

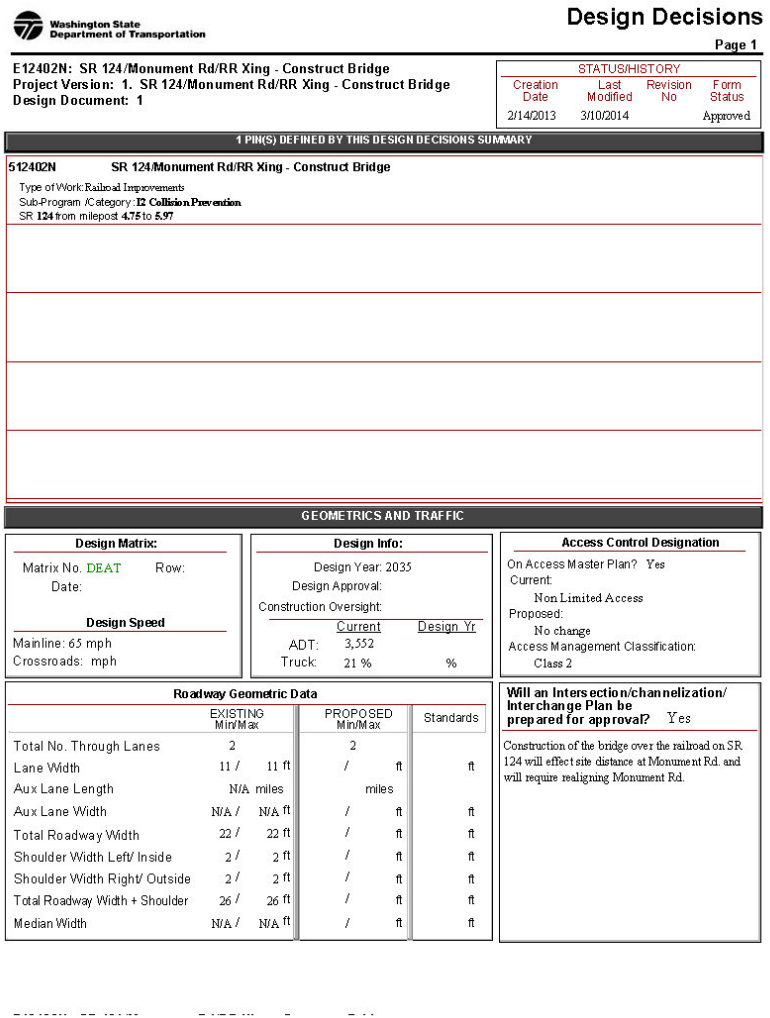
This bridge has a 2013-2015 biennium statewide deck rehabilitation priority rank of 31. The deck has 198 square feet of delamination covering 1% of the surface.

STATEMENT OF PURPOSE

The purpose of this project is to rehabilitate and preserve the structural integrity of the bridge deck.

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



Washington State Department of Transportation

Design Decisions

Page 1

E12402N: SR 124/Monument Rd/RR Xing - Construct Bridge
Project Version: 1. SR 124/Monument Rd/RR Xing - Construct Bridge
Design Document: 1

STATUS/HISTORY			
Creation Date	Last Modified	Revision No	Form Status
2/14/2013	3/10/2014		Approved

1 PIN(S) DEFINED BY THIS DESIGN DECISIONS SUMMARY

512402N SR 124/Monument Rd/RR Xing - Construct Bridge

Type of Work: Railroad Improvements
Sub-Program /Category: **I2 Collision Prevention**
SR **124** from milepost **4.75** to **5.97**

GEOMETRICS AND TRAFFIC

Design Matrix:

Matrix No. DEAT Row:
Date:

Design Speed

Mainline: 65 mph
Crossroads: mph

Design Info:

Design Year: 2035
Design Approval:
Construction Oversight:

	Current	Design Yr
ADT:	3,552	
Truck:	21 %	%

Access Control Designation

On Access Master Plan? Yes
Current:
Non Limited Access
Proposed:
No change
Access Management Classification:
Class 2

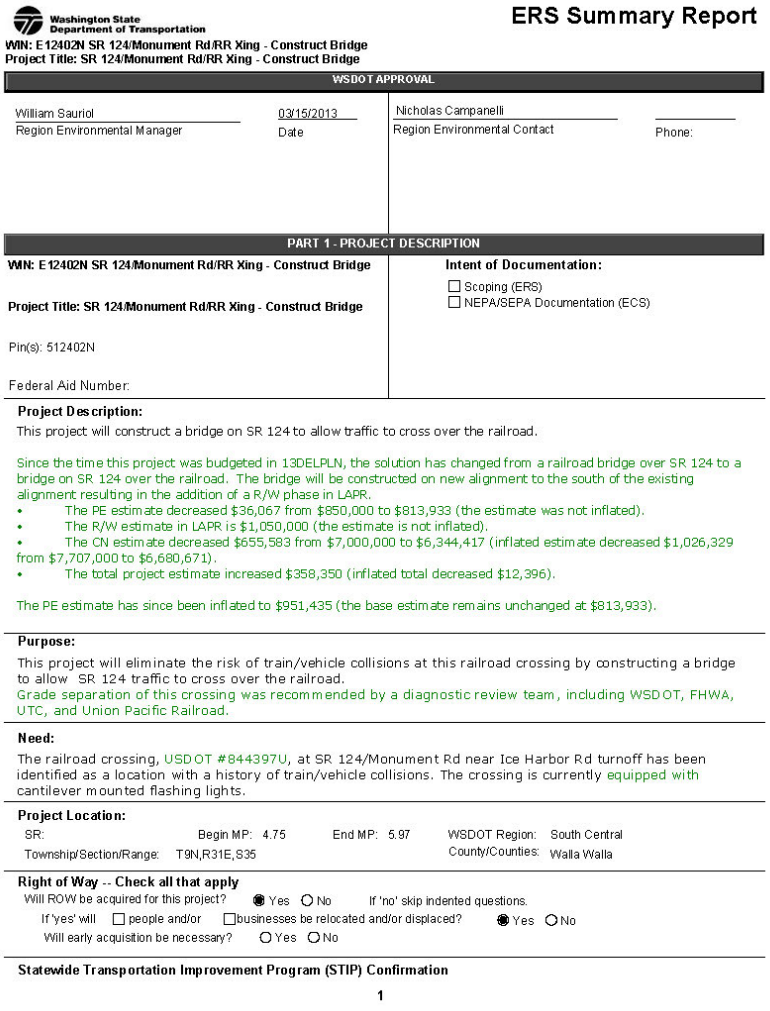
Roadway Geometric Data

	EXISTING Min/Max	PROPOSED Min/Max	Standards
Total No. Through Lanes	2	2	
Lane Width	11 / 11 ft	/ ft	ft
Aux Lane Length	N/A miles	miles	
Aux Lane Width	N/A / N/A ft	/ ft	ft
Total Roadway Width	22 / 22 ft	/ ft	ft
Shoulder Width Left/ Inside	2 / 2 ft	/ ft	ft
Shoulder Width Right/ Outside	2 / 2 ft	/ ft	ft
Total Roadway Width + Shoulder	26 / 26 ft	/ ft	ft
Median Width	N/A / N/A ft	/ ft	ft

Will an Intersection/channelization/ Interchange Plan be prepared for approval? Yes

Construction of the bridge over the railroad on SR 124 will effect site distance at Monument Rd. and will require realigning Monument Rd.

Environmental Review Summary



Washington State Department of Transportation

ERS Summary Report

WIN: E12402N SR 124/Monument Rd/RR Xing - Construct Bridge
Project Title: SR 124/Monument Rd/RR Xing - Construct Bridge

WSDOT APPROVAL

William Sauriol Region Environmental Manager	03/15/2013 Date	Nicholas Campanelli Region Environmental Contact	Phone:

PART 1 - PROJECT DESCRIPTION

WIN: E12402N SR 124/Monument Rd/RR Xing - Construct Bridge

Project Title: SR 124/Monument Rd/RR Xing - Construct Bridge

Pin(s): 512402N

Federal Aid Number:

Intent of Documentation:

☐ Scoping (ERS)
☐ NEPA/SEPA Documentation (ECS)

Project Description:

This project will construct a bridge on SR 124 to allow traffic to cross over the railroad.

Since the time this project was budgeted in 13DELPLN, the solution has changed from a railroad bridge over SR 124 to a bridge on SR 124 over the railroad. The bridge will be constructed on new alignment to the south of the existing alignment resulting in the addition of a R/W phase in LAPR.

- The PE estimate decreased $36,067 from $850,000 to $813,933 (the estimate was not inflated).
- The R/W estimate in LAPR is $1,050,000 (the estimate is not inflated).
- The CN estimate decreased $655,583 from $7,000,000 to $6,344,417 (inflated estimate decreased $1,026,329 from $7,707,000 to $6,680,671).
- The total project estimate increased $358,350 (inflated total decreased $12,396).

The PE estimate has since been inflated to $951,435 (the base estimate remains unchanged at $813,933).

Purpose:

This project will eliminate the risk of train/vehicle collisions at this railroad crossing by constructing a bridge to allow SR 124 traffic to cross over the railroad.
Grade separation of this crossing was recommended by a diagnostic review team, including WSDOT, FHWA, UTC, and Union Pacific Railroad.

Need:

The railroad crossing, USDOT #844397U, at SR 124/Monument Rd near Ice Harbor Rd turnoff has been identified as a location with a history of train/vehicle collisions. The crossing is currently equipped with cantilever mounted flashing lights.

Project Location:

SR: Begin MP: 4.75 End MP: 5.97 WSDOT Region: South Central
Township/Section/Range: T9N,R31E,S35 County/Counties: Walla Walla

Right of Way -- Check all that apply

Will ROW be acquired for this project? ◉ Yes ○ No If 'no' skip indented questions.
If 'yes' will ☐ people and/or ☐ businesses be relocated and/or displaced? ◉ Yes ○ No
Will early acquisition be necessary? ○ Yes ○ No

Statewide Transportation Improvement Program (STIP) Confirmation

1

- Completed by the Environmental Office for your project

Project Summary - Changes

PROJECT SUMMARY

CURRENT

Stored in FileMaker Pro

CONTAINS

Project Definition
Design Decision Summary/BOD
Environmental Review Summary

FUTURE

Stored in TEIS

CONTAINS

Project Profile
(includes Basis of Estimate)
Basis of Design
Environmental Review Summary

Beginning July 2020, there will be a Pre-Design phase

Pre-Design Phase

- With PE phase starting after July 2020
  - New Pre-Design Phase instigated
  - BOD approved by Region
  - Concurrence by ASDE

- BOD and Project Summary are the deliverables

- Upon completion of the Pre-Design Phase, remaining PE funds will be dispersed

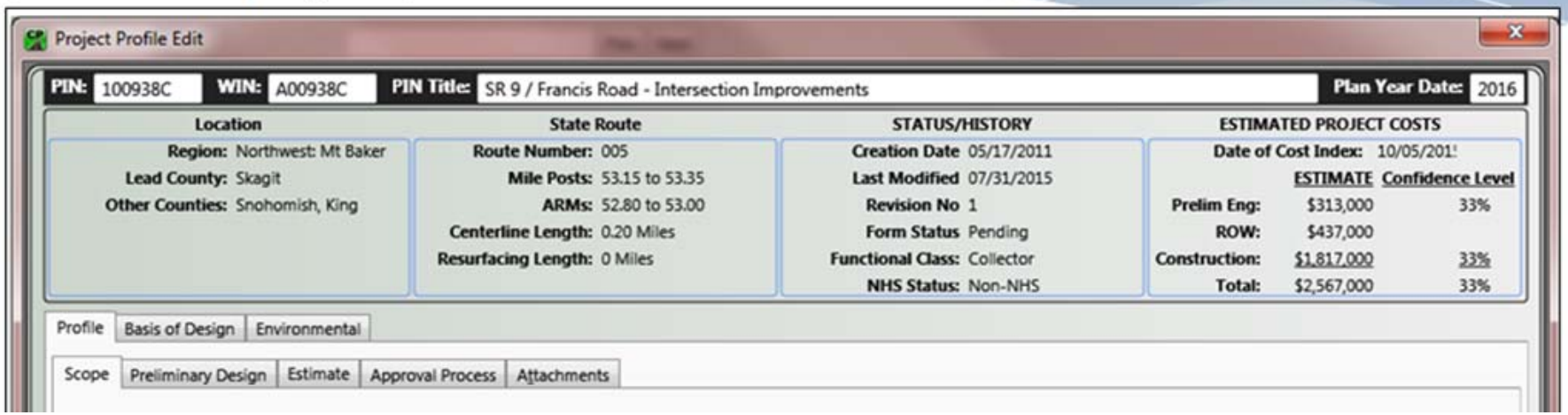
- Change Management after Pre-Design will require CPDM and ASDE involvement

Project Profile

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

TEIS Capital Projects
Version 4.0

Profile - Scoping Tab



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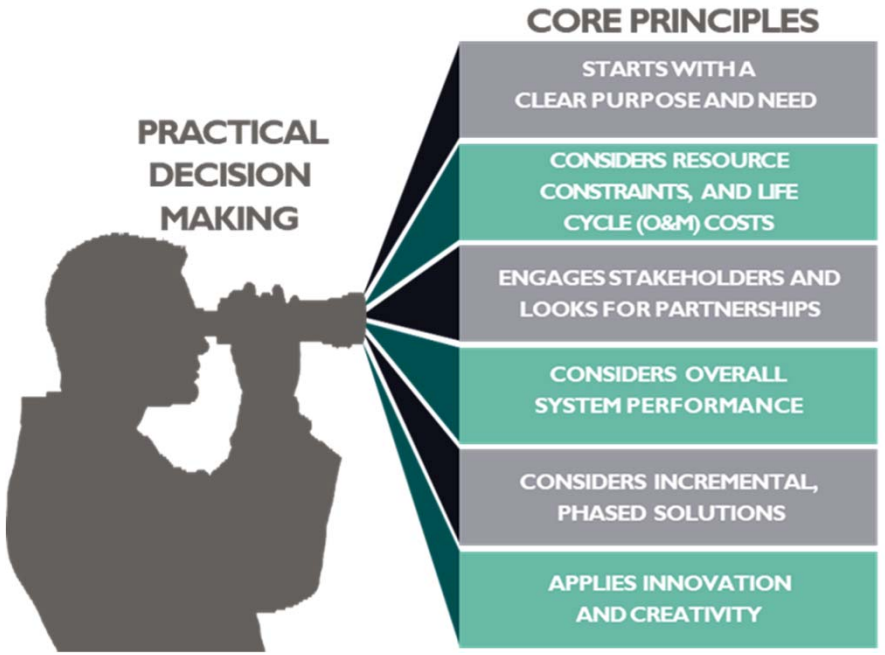
Basis of Design

WSDOT Projects

Basis of Design (BOD)

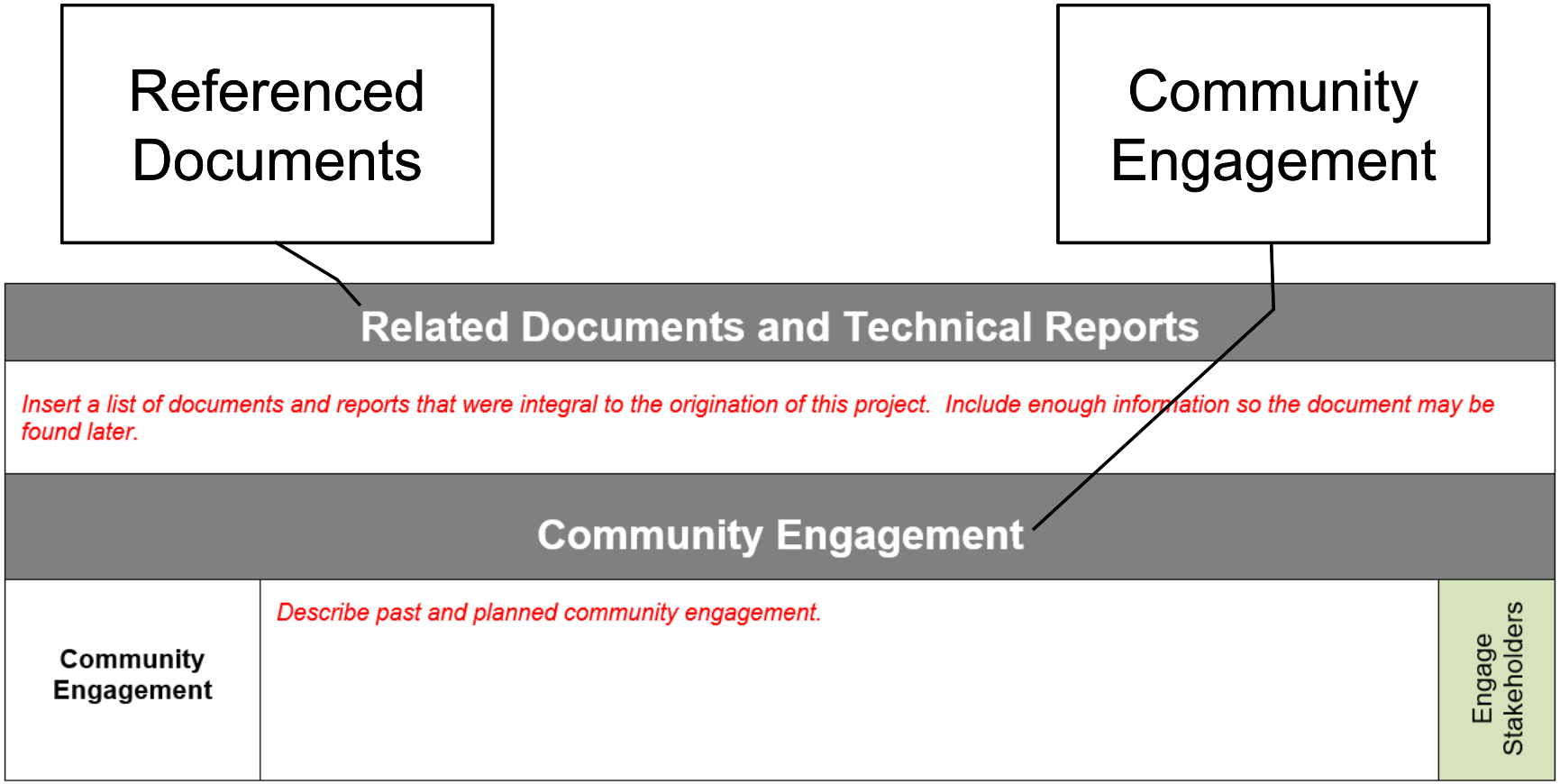
WSDOT Projects

- Current Version is September 2017
- New form December 2019
  - Incorporates Six Core Principles
  - Simplifies data entry
  - Incorporates guidance into the form
- Contact your ASDE about switching



Six Core Principles noted on the right side of the BOD

Basis of Design



- 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.

Six Core Principles

Basis of Design

BOD – Header

Route Information	Project Information and Background	Future and Related Projects	Major Enviro Considerations

General Project Information								
Route Information	SR	NHS (Y/N)	Functional Class	City		County		Clear Purpose and Need
Project Information	Begin SRMP	End SRMP	Budget	Funding Sub-Program	Posted Speed	AADT	Truck %	
Important Project History or Background								
Future and Related Projects								
Major Environmental Considerations								

Basis of Design

BOD – Section 1

Understand the
Project Need
Including the contributing factors

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

Contributing Factors

Section 1) Project Needs		
Baseline Need (BN)	**BN1 Statement:** *Describe the first baseline need* Metric: Target:	Clear Purpose and Need
	Contributing Factors: *What are the contributing factors to each Baseline Need?*	
	BN# Statement: *Describe BN2, BN3, BN4, etc. Delete if not applicable.* Metric: Target:	
	Contributing Factors: *What are the contributing factors to each Baseline Need?*	

Baseline need(s) – must be addressed by the project

Basis of Design

BOD – Section 1

Understand the
Project Need
Including the contributing factors

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

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

Contributing Factors

Section 1) Project Needs		
Contextual Need (CN)	**CN1 Statement:** *Describe the contextual need* Metric: Target:	Consider Resource Constraints Engage Stakeholders
	Contributing Factors: *What are the contributing factors to each Contextual Need?*	
	CN# Statement: *Describe additional contextual needs using CN2, CN3, CN4, etc. Delete if not applicable.* Metric: Target:	
	Contributing Factors: *What are the contributing factors to each Contextual Need?*	

Contextual Needs – may or may not be addressed

Basis of Design

BOD – Section 1

Understand the
Project Need
Including the contributing factors

SAFETY ANALYSIS
See Safety Analysis Guide

Section 1) Project Needs		
Safety Analysis	☐ No ☐ Yes *If YES, enter the title and date. If NO enter why it was not needed. See DM Chapter 321 and the Safety Analysis Guide.*	Consider Overall System Performance

Place Safety Analysis in the Design Approval

Basis of Design

BOD – Section 2

Consider the **Context**

List your Multidisciplinary Team Members: Maintenance, Construction, Local Agencies, Community Stakeholders, etc.

Land Use Context

Section 2) Context

In consultation with Multidisciplinary Team Members

Roadway _____ MP _____ to MP _____

[Duplicate this section as necessary to reflect distinct segments with different context]

Multidisciplinary Team Members	*List the different agencies, community stakeholders, and divisions involved in determining the context for this project.*			Engage Stake-holders
Land Use Context	**Freeway**	☐ Rural ☐ Urban	☐ Interstate ☐ Non-Interstate	Consider Overall System Performance
	Non-Freeway	☐ Rural ☐ Rural Town Center ☐ Suburban ☐ Urban ☐ Urban Core		

Basis of Design

BOD – Section 2

Consider the
Context

Section 2) Context
In consultation with Multidisciplinary Team Members

Transportation Context

Bicycles

Usage	None	Rare	Low	Med	High	Involve Multidisciplinary Team Members
Current	☐	☐	☐	☐	☐	
Future	☐	☐	☐	☐	☐	
Comments	*Coordinate with Multidisciplinary Team Members. Describe any special design considerations that apply. Utilize the Context Modal Accommodation Report (CMAR) to fill in this information.*					

User Type	Recreational	Interested but Concerned	Experienced	Involve Multidisciplinary Team Members
Current	☐	☐	☐	
Future	☐	☐	☐	
Comments	*Coordinate with Multidisciplinary Team Members. Describe any special design considerations that apply. Utilize the Context Modal Accommodation Report (CMAR) to fill in this information. You may check more than one box.*			

Pedestrians

Usage	None	P1 Rare	P2 Low	P3 Med	P4 High	Involve Multidisciplinary Team Members
Current	☐	☐	☐	☐	☐	
Future	☐	☐	☐	☐	☐	
Comments	*Coordinate with Multidisciplinary Team Members. Describe any special design considerations that apply. Utilize the Context Modal Accommodation Report (CMAR) to fill in this information.*					

Consider Overall System Performance

Use the Context Modal Accommodation Report to assist with this information

Basis of Design

BOD – Section 2

Consider the
Context

Section 2) Context In consultation with Multidisciplinary Team Members									
Transportation Context	**Freight**	Classification	T-1	T-2	T-3	T-4	T-5	See Truck Freight Classification	Consider Overall System Performance
		Current	☐	☐	☐	☐	☐		
		Future	☐	☐	☐	☐	☐		
		Comments	*Coordinate with Multidisciplinary Team Members. Describe any special design considerations that apply.*						
	Transit		None	Low	Medium	High	Transit Agencies		
		Current	☐	☐	☐	☐	*List all transit agencies that operate within the project limits.*		
		Future	☐	☐	☐	☐			
		Comments	*Coordinate with Multidisciplinary Team Members. Describe any special design considerations that apply.*						
	Complete Streets and Main Street Highways	☐ No ☐ Yes *Does the city have a Complete Street ordinance or plan? Is it a Main Street highway? Consult with the Region Planning Office and the City.*							

- See Truck Freight Classification
- Talk to Local Transit Agency
- Talk to cities/towns about Complete Streets plans and ordinances
- Talk to Region Planning about Main Street Highway designation

Basis of Design

BOD – Section 3

Evaluate
Design Controls

Section 3) Design Controls
In consultation with Multidisciplinary Team Members

Roadway _____ MP _____ to MP _____

[Duplicate this section as necessary to align with the Context described in Section 2]

Design Year	*Design year and selection rational*				*Incremental Phased Solutions*
Modal Accommodation Priorities *Priority 1,2,3 etc. 1 is highest*	Mode	Priority Current	Priority Future	Notes	Consider Overall System Performance
	Automobiles				
	Transit				
	Freight				
	Pedestrians				
	Bicyclists				
	Other				

DESIGN YEAR with selection rational

Current and Future Modal Priority

Add narrative about the modes to help explain the priority

Basis of Design

Evaluate
Design Controls

Intersection Design Vehicle

Terrain Classification

Access Control

Target Speed

Section 3) Design Controls
In consultation with Multidisciplinary Team Members

I/S Design Vehicle	*Describe the intersection design vehicles for all intersections that will be modified by the project. State the Design Vehicle for each leg of the intersection.*		Consider Overall System Performance
Terrain	☐ Level ☐ Rolling ☐ Mountainous		
Access Control	Existing		
	Planned	*See Region Planning Office for the Access Master Plan*	
	Proposed		
Target Speed	*State the Target Speed and how you it was determined.*		

Basis of Design

BOD – Section 4

Formulate & Evaluate
Alternatives
That meet the need

- Use BOD for simple alternative comparison
- Detailed comparison in Alternative Comparison Table (ACT)
- Intersection Control Evaluation (ICE) may be referenced

Section 4) Alternative Analysis			
		Alternative Name and Description	Consider Resource Constraints and Life Cycle Cost Consider Incremental Phased Solutions Apply Innovation and Creativity
Alternatives Considered (circle the preferred alternative)	**A**	*Provide a brief description of each alternative considered. Talk about key elements of the alternative that came into consideration when selecting the preferred alternative. Include cost.*	
	B		
	C		
	D		
Preferred Alternative ____ was selected because: *Describe why you selected the preferred alternative. 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. If the prime considerations for selecting an alternative were documented in another document, you do not need to go into detail here. Instead, provide a summary, reference the document, and include it in the Design Approval.*			

Basis of Design

BOD – Section 5

Document selection of
Design Elements

- 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

Section 5) Design Element Selection

For each design element below, identify whether or not the design element is included in the preferred alternative for each alignment or location. You can group alignments into a single location if desired. You may need to add or delete columns.

Design Element	Alignment #1- SR 999	Alignment #2	Alignment #3	Alignment #4	Alignment #5	Alignment #6
1. Lane	X					
2. Median / Buffer	X					
3. Shoulder	X					
4. Streetside / Roadside Zone						
5. Pedestrian Facility						

Basis of Design (BOD)

For Non-Interstate and Non-WSDOT Projects

- WSDOT Jurisdiction is Curb to Curb
  - RCW 47.24.020
  - City Streets as Part of State Highways
- WSDOT BOD
  - Consultant or Local Agency is designing the project on the behalf of the WSDOT
  - Interstate projects
- Summary of Design (SOD)
  - Local Agency/Tribal/Developer projects within WSDOT jurisdiction
  - Not applicable on Interstate projects

Statement of Design (SOD)

Contains Four Sections:

1. Proponent Information
2. Concurrency/Approval Signatures
3. Project Information
4. Design Elements

Washington State Department of Transportation

Summary of Design (SOD)

For Non-Interstate, Non-WSDOT Projects, such as Tribal, Local Agencies, and Development Services Projects

This SOD captures important decisions that control the outcome of a Non-WSDOT project on a state route, including operational, safety, and design controls and design elements necessary to implement practical design.

Proponent Information			
SR (Multiple SR's may be listed)	**Region** Choose an item.	**Local Programs Proj. #**	**Region Contact**

SOD Proponent Information

- Basis Project Information
  - SR
  - Region
  - Project Title
  - Project Proponent
  - Year of Construction

SOD Project Information

Short write-ups on the following items:

- Project Description (including alternatives considered)
- Project History/Background
- Community Engagement
- Applicable Related Documents
- Funding
- Future/Nearby Projects
- Relationship to Proposed Land-Use Development
- Additional Land-Use Phases Required?
- Multimodal Considerations
- Project Metadata: SRMP, Functional Class, ADT, Truck%, County, City, Access Control, Design Year

SOD Design Elements

Declare design criteria: AASHTO, WSDOT, LAG

Declare *existing* and *proposed* dimensions:

Design Elements *(Design Manual 1105)*			
Design Element	**Changed**	**Existing Dimension(s)**	**Proposed Dimension(s)**
1. Lane Width(s) *	☐		
2. Median / Buffer	☐		
3. Shoulder Width(s) *	☐		
4. Streetside / Roadside Zone	☐		
5. Pedestrian Facilities	☐		
6. Bicycle Facilities	☐		
7. Bridges	☐		
8. Horizontal Alignment	☐		
9. Vertical Alignment	☐		
10. Cross Slope	☐		
11. Side Slope	☐		
12. Clear Zone	☐		

Can SOD Replace BOD?

SOD CAN REPLACE BOD ALL OTHER ELEMENTS OF DESIGN APPROVAL ARE REQUIRED (IF APPLICABLE)

- Stamped Cover Sheet
- Design Approval Memorandum
- Vicinity Map
- Project Summary Documents
- ***SUMMARY 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

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 you're 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

BOD – Exemptions

Design Manual Chapter 1100.10(1)(a)(3)

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

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Alternatives Comparison Table

Use Baseline Need(s) from BOD

Use Contextual Need(s) from BOD

Alternatives Comparison Table -
SR 999 Elm Street to Fulton Street - Paving

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

	Baseline Performance Metrics				Contextual Performance Metrics				Cost
Mode	Vehicles & Bikes				Bikes	Vehicles & Bikes	Vehicles	Affected modes here.	
Add the names of your alternatives / Performance METRIC / ALTERNATIVE	BN1 - Zero Square yards of pavement deterioration				CN1 - Bike connectivity between MP 1.00 and 1.32	CN2 - Similar or less risk of fatal or injury crashes	CN3 - LOS A	In these columns, insert the metrics that you will use to weigh each alternative.	
A - Retain Existing Channelization	++				- -	-	O	Rate the alternatives against each other in this area.	$1M
B - 5 ft. Bike lanes, an 11 ft. lane in each direction, and a center 12 ft. two-way left-tum lane	++				++	++	++		$1M
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-tum lane	++				+	++	++		$1M + Maintenance of candle sticks
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-tum lane	++				+	+	+		$1M + Maintenance of candle sticks

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.

Trade off notes here.

Ledged
++ Very Good
+ Good
O Neutral
- Poor
- - Poorest

Alternatives Comparison Table

Alternatives Comparison Table -
SR 999 Elm Street to Fulton Street - Paving

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

	Baseline Performance Metrics				Contextual Performance Metrics						Cost
Mode ⇨	Vehicles & Bikes				Bikes	Vehicles & Bikes	Vehicles				
Add the names of your alternatives ⇩ / Performance METRIC ⇨ / ALTERNATIVE	BN1 - Zero Square yards of pavement deterioration				CN1 - Bike connectivity between MP 1.00 and 1.32	CN2 - Similar or less risk of fatal or injury crashes	CN3 - LOS A				
A - Retain Existing Channelization	++				--	-	O				$1M
B - 5 ft. Bike lanes, an 11 ft. lane in each direction, and a center 12 ft. two-way left-turn lane	++				++	++	++				$1M
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	++				+	++	++				$1M + Maintenance of candle sticks
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	++				+	+	+				$1M + Maintenance of candle sticks

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
O Neutral
- Poor
-- Poorest

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

Legend

++ Very Good
+ Good
O Neutral
- Poor
-- Poorest

Alternatives Comparison Table may be found on the ASDE website

Alternatives Comparison Table

Example – SR 509 Completion Project

Scenario Comparison Table - SR 509 Completion Project

Date: 6/8/16

Performance Category	Essential Performance Metrics											Contextual Performance Metrics									Cost
	Mobility								Economic Vitality		Safety	Safety	Mobility				Env't	Other			
Mode	Auto / Freight	HOV / BUS	Freight / Auto / Transit	Freight / Auto / Transit	Freight / Auto / Transit	Freight / Auto / Transit	Freight / Auto / Transit	Freight / Auto / Transit							Ped	Ped & Bike					
Performance METRIC / SCENARIO	SR 509 Performance		I-5 Performance	Delay	Airport - Travel Time	Airport - Travel Time Reliability	Centers - Travel Time	Centers - Travel Time Reliability	Economic Benefit	Local and Regional Comprehensive Plan	Safety	Safety	Support multimodal choices to SeaTac Airport and KDM Link Light Rail	Improve intermodal relationships between the SeaPort, Airport, and	Number and location of Crossings	Continuity and Consistency of Pedestrian and Bicycle facilities	Sensitive Area Impact	Forward Compatibility with future highway widening	Right of Way Impact	Sound Transit FWLE Project Compatibility	PRELIMINARY COST REVIEW
No Build	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	●	○	●	●	
Scenario 1 - Closing the Gap	◔	◔	◑	◑	◑	◑	◑	◑	◑	◔	◔	◑	◑	◔	◔	◕	●	◔	●	◕	$ 710M
Scenario 2 - Limited Connectivity	◔	◔	◑	◑	◕	◑	◑	◑	●	◑	◔	◑	◕	◑	◕	◑	●	◑	◔	◔	$ 860M
Scenario 3 - Moderate Connectivity	◕	◕	◑	◕	◕	◑	◕	◑	●	◑	◑	◕	◕	◕	◕	◕	◕	◕	◕	◑	$ 880M
Scenario 4 - Full Connectivity	◕	◕	◕	◑	●	◑	◕	◑	◕	●	◑	◕	●	◕	◕	◑	◕	◕	◔	◑	$ 1050M
Scenario 5 - Full-Build	◑	●	◕	◕	●	◑	◕	◑	◕	●	◑	◕	●	●	◕	◕	◑	●	◔	◔	$ 1880M

Performance Trade-Offs Discussion and Recommended Preferred Scenario

● Very Good
◕ Good
◑ Moderate
◔ Fair
○ Poor

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Design Parameters Worksheet

If there is an "X" in Section 5 of the BOD, Fill out the corresponding section in the Design Parameters Worksheet … and vice-versa.

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

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

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Safety Analysis Guide

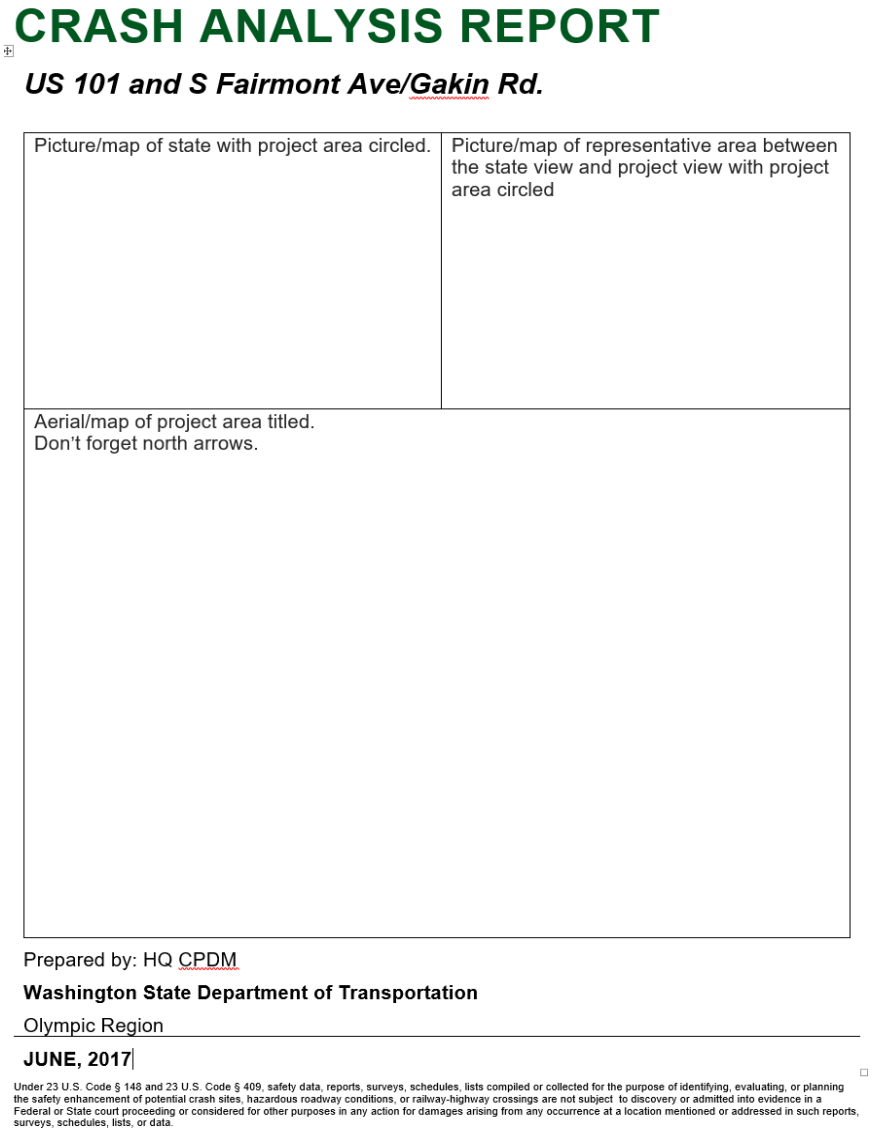
- Will give direction on safety analysis by funding category (I1, I2, P1, P2, etc.)
- Will include a table that details:
  - What Triggers an Analysis
  - Study Area
  - Study Period
  - Scope of an Analysis
  - Methodology
  - Suggested Tools
  - Goals (What we are trying to accomplish by an analysis)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

Crash Analysis Report vs. Safety Analysis

Crash Analysis Report (CAR)	Safety Analysis
Crash Analysis Report (CAR) Only required in I-2 safety projects	**Safety Analysis** Required on other project types
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 & 2019-2021
- Using the 2019-2021 CAR template replaces the need for a BOD.



CRASH ANALYSIS REPORT

US 101 and S Fairmont Ave/Gakin Rd.

Picture/map of state with project area circled.	Picture/map of representative area between the state view and project view with project area circled
Aerial/map of project area titled. Don't forget north arrows.	

Prepared by: HQ CPDM

Washington State Department of Transportation

Olympic Region

JUNE, 2017

Under 23 U.S. Code § 148 and 23 U.S. Code § 409, safety data, reports, surveys, schedules, lists compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential crash sites, hazardous roadway conditions, or railway-highway crossings are not subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

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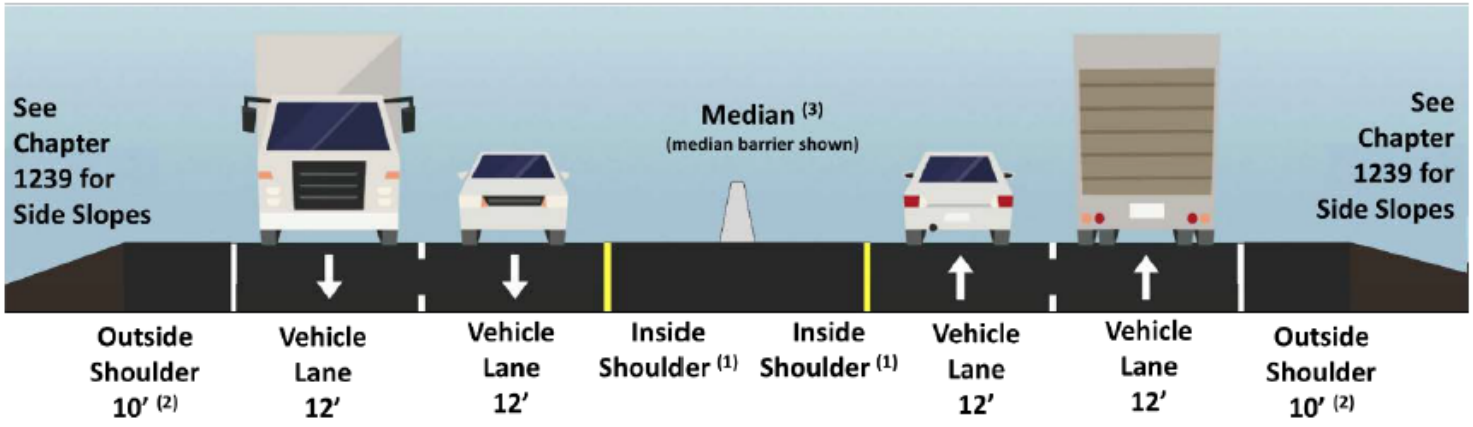
When do I need a Design Analysis?

- Any time you want to vary from the policy set forth in the Design Manual
  - Required when specifically stated
  - Required when a chosen dimension does not meet the value or fall within the range of values

When do I need a Design Analysis?

- Required when specifically stated:

Exhibit 1232-1 Geometric Cross Section - Interstate (4 lanes shown, can vary)



Notes:

See Chapter 1410 for HOV lane guidance.

Use of the shoulder on a freeway for transit only use or as an HOV lane requires a Design Analysis.

[1] 4 ft minimum on facilities up to 4 lanes, and 10 ft minimum on 6-lane facilities.
In mountainous terrain, inside shoulder may be reduced to 4 ft on facilities up to 6 lanes.

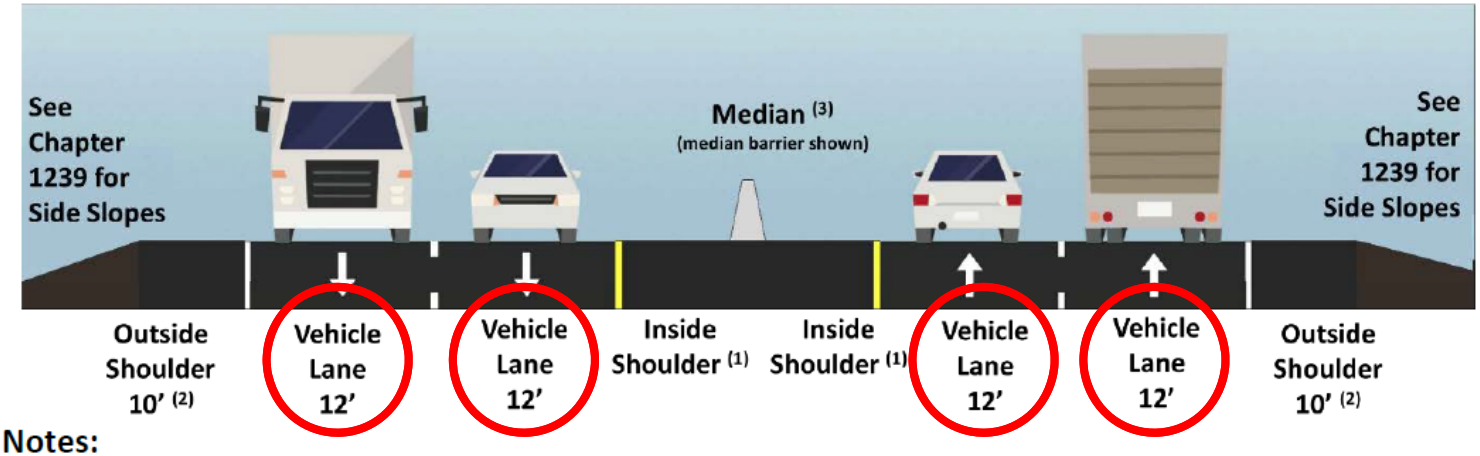
[2] In mountainous terrain, outside shoulders may be reduced to 8 ft on facilities up to 6 lanes.

[3] Overall median width and design will vary. See Chapter 1239 and 1610.

When do I need a Design Analysis?

- Required when a chosen dimension does not meet the value or fall within the range of values
  - Meet: Lane wide 12’ on Interstate

Exhibit 1232-1 Geometric Cross Section - Interstate (4 lanes shown, can vary)



Notes:

See Chapter 1410 for HOV lane guidance.

Use of the shoulder on a freeway for transit only use or as an HOV lane requires a Design Analysis.

[1] 4 ft minimum on facilities up to 4 lanes, and 10 ft minimum on 6-lane facilities.
In mountainous terrain, inside shoulder may be reduced to 4 ft on facilities up to 6 lanes.

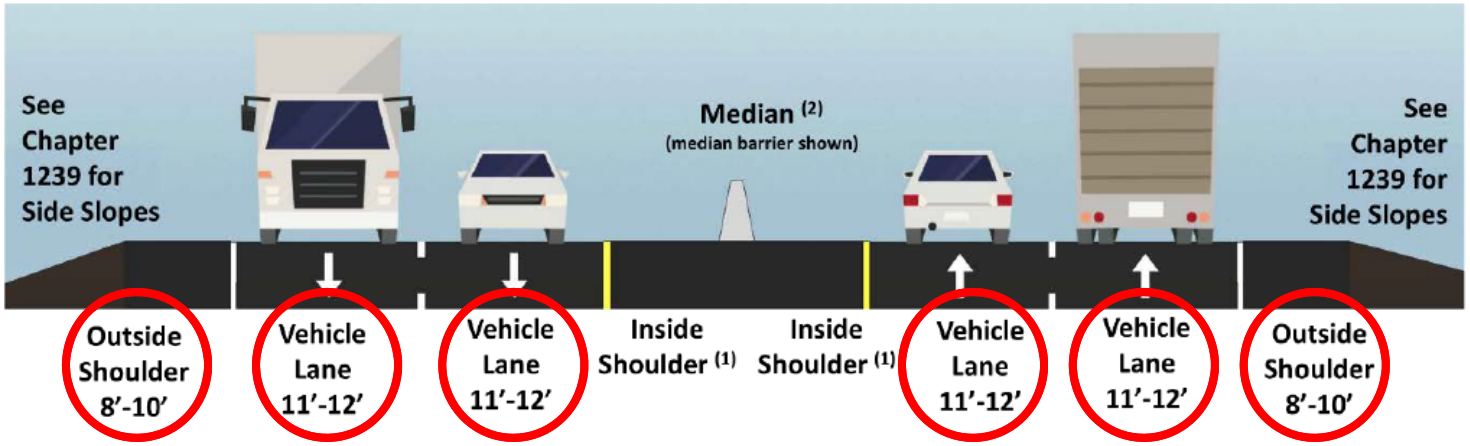
[2] In mountainous terrain, outside shoulders may be reduced to 8 ft on facilities up to 6 lanes.

[3] Overall median width and design will vary. See Chapter 1239 and 1610.

When do I need a Design Analysis?

- Required when a chosen dimension does not meet the value or fall within the range of values
  - Range: 11-12’ lanes, 8-10’ shoulders

Exhibit 1232-2 Geometric Cross Section – Non-Interstate (4 lanes shown, can vary)



Notes:

See Chapter 1410 for HOV lane guidance.

Use of the shoulder on a freeway for transit only use or as an HOV lane requires a Design Analysis.

[1] 4 ft minimum on facilities up to 4 lanes, and 8 ft minimum on 6-lane facilities.
In mountainous terrain, inside shoulder may be reduced to 4 ft on facilities up to 6 lanes

[2] Overall median width and design will vary. See Chapter 1239 and 1610.

When do I need a Design Analysis?

- The direction may not use “hard” words like “require” or “shall” or “must”:
  - 1360.04(1)(a) Lane Balance and Entrances

    “At entrances, make the number of lanes beyond the merging of two traffic streams not less than the sum of all the lanes on the merging roadways less one (see Exhibit 1360-7a).”
  - 1610.03(5) Length of Need

    “Length of need refers to the total length of longitudinal barrier needed to shield a fixed feature.”

When do I need a Design Analysis?

- Sometimes the work “required” is associated with a process, not a roadway feature:
  - VE study *required* on projects over $25 Million
  - All projects are *required* to have a safety analysis for Design Approval
  - *Required* by law to perpetuate existing recorded monuments.
- Not following a “required” process must receive approval from your Region Management and HQ, but does not require a design analysis

When do I need a Design Analysis?

- Sometime the constraint is found in the Exhibits
  - 1515.02(2)(a) Shared-Use Path Widths

    "Shared-use path shoulders are typically unpaved and 2 feet wide on either side. Exhibits 1515-3 through 1515-5 provide additional information and cross-sectional elements."

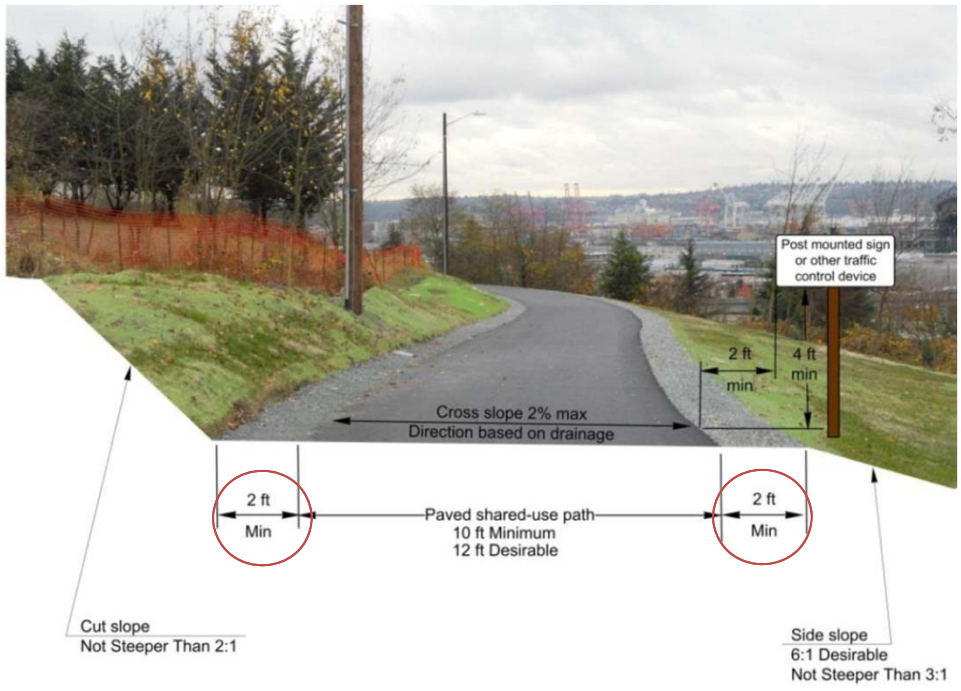


Exhibit 1515-3

Design Analysis Approvals

WSDOT Projects

Classification	Project Type	Approver
Interstate & Projects of Division Interest	All	FHWA Area Engineer & ASDE
National Highway System (NHS)	All	ASDE
Non-NHS	Improvement	ASDE
Non-NHS	Preservation	Region

Design Analysis Approvals

Local Agency & Developer Projects

Classification	Project Type	Approver
Interstate	All	FHWA Area Engineer & ASDE
Limited Access NHS & non-NHS	All	ASDE
Managed Access NHS & non-NHS	All	ASDE

Region Design Analysis

- If a design element cannot meet Design Manual criteria, but can meet current AASHTO guidance adopted by FHWA … it is a Region Design Analysis
  - AASHTO guidance adopted by FHWA is online
- Send a PDF of Region Design Analysis to your ASDE
  - We are required to report to FHWA on a yearly basis

Design Analysis Tips

- Engage your ASDE early
- Use your ASDE as a sounding board
- Read your Design Manual
- Do not begin the Design Analysis process with a preferred alternative
- Find the right answer rather than meet the design criteria
- Do not ***NOT*** do something because it requires a Design Analysis
- If you need examples, ask your ASDE

Design Analysis Tips

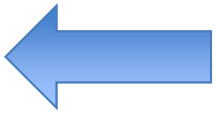
- Use the template as a tool to document the right solution
- Be quantitative when possible
- Safety and Operations … do them
- Thing about mitigation ... What can you do to mitigate risk?
- Use impacts to other things rather than cost
- Cost is a consideration, but not the sole answer

Just the Facts

- Stick to the facts – no opinions
- Consider it a court document
- The form will help provide you the elements necessary for your defense
  - Background
  - Decision Description
    - Design Criteria
  - Options Evaluation
    - Methodology
    - Metrics / Consideration
    - Tradeoffs Show how they meet the metrics
    - Mitigation

Which of these is a fact?

Reducing Speeds, Reduces …

A. Auto Crashes
B. Pedestrian Crashes
C. Severity of Pedestrian Injury 
D. Bike Crashes
E. Work Zone Crashes
F. All of the Above

Road Safety Web Publication No. 16, Relationship between Speed and Risk of Fatal Injury: Pedestrians and Car Occupants, D.C. Richards, Transport Research Laboratory, September 2010

Design Analysis

Road Safety Web Publication No. 16

Conclusions:

- The three pedestrian datasets show a similar pattern in fatality risk. The risk increases slowly until impact speeds of around 30 mph. Above this speed, risk increases rapidly – the increase is between 3.5 and 5.5 times from 30 mph to 40 mph.
- The risk of fatality is generally higher for the dataset from the 1970s, indicating that the risk of pedestrian fatality has reduced over the last 30 years.
- Even though the risk of pedestrians being killed at 30 mph is relatively low, approximately half of pedestrian fatalities occur at this impact speed or below.

Design Analysis

Road Safety Web Publication No. 16

In the text:

Ashton and Mackay data

- It should be noted that there are some slight and serious accidents which are not reported to the police and, therefore, are not present in the national statistics (Department for Transport, 2009). This means that once the results are weighted, they are likely to give an overestimate of the risk of fatality.
- Pasanen calculated the relationship between impact speed and the risk of pedestrian fatality using the data from Ashton
- Pasanen (1992) calculated a relationship between driving speed and the risk of pedestrian fatality:

$$P = \frac{1.027}{1 + 37e^{-0.017v^2}} - 0.027$$

- Pasenen's results are an overestimate of the risk of pedestrian fatality.

Design Analysis

DESIGN DECISION / DESIGN ANALYSIS

Document Title: Design Analysis #7 – WB HOV Direct Access Off-Ramp @ 24th Ave E (HWDX)

Project Title: Montlake to Lake Washington I/C and Bridge Replacement

SR 520 MP 0.84 TO MP 2.34

XL-5097 PIN-852001L

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

Region: SR 520

Office: SR 520

Prepared by: P. Merrell / J. Haukap

Project Engineer: D. Dunjic

PHILIP D. MERRELL STATE OF WASHINGTON 29206 REGISTERED PROFESSIONAL ENGINEER

EXPIRES 5/18/18

Document Phase: ☐ Preliminary / ☒ Final

Under 23 U.S. Code § 409 and 23 U.S. Code § 148, safety data, reports, surveys, schedules, lists compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential crash sites, hazardous roadway conditions, or railway-highway crossings are not subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data

WSDOT

Document Title:
Design Analysis #7 – WB HOV Direct Access Off-Ramp @ 24th Ave E (HWDX)

pg. 1

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.

Project Background

- Briefly describe the project.
- Background information important to decisions
- Related documents including project BOD

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.

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

Any needed details

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 18+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 15+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

Variance ID#s

- TW1
- SW1 & SW2

Any guidance other than Design Manual?

Design Analysis

Discussion of Methodology

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"

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 CN6 were also utilized.

- Discuss evaluation methodology
- Describe metrics / considerations used to pick preferred alternative.
- Methodology for comparing design elements (shoulder and ramp width)

Design Analysis

Options Comparison Table

Metrics / Considerations

Trade Offs

Options

Section 3: Options Evaluation and Decision

Issue and Location:

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.

Options Comparison Table

Options Evaluated ↓	Associated Issues (identified in Section 2)	Metrics / Considerations: *Safety Performance* — Performance Results:	*Operational and Mobility Performance* — Performance Results:	*CN4 – Improve Regional and Local Transit Connectivity and Operations* — Performance Results:	*CN6 - Sustainability* — Performance Results:
Full Standard Option Ramp Terminal Width 25' [2, 15, 8]	SW1, SW2, TR1	Does not Provide Traffic Calming for Low Speed Context Change	A-BUS Fully Accommodated Including Ability for One A-BUS to Pass Another Stalled A-BUS for Entire Length of Off-Ramp	Improved Transit Connectivity and Operations	Area of Pavement Surface = 172 SF more than Narrower Width Option
Narrower Width Option Ramp Terminal Width 16' [1,14,1]	SW1, SW2, TR1	Provides Traffic Calming, Potentially Reduces Wrong Way Movements, and is Consistent with Low Speed Context	A-BUS Not Fully Accommodated Where One A-BUS is Not Able to Pass Another Stalled A-BUS at Off-Ramp Terminal Area	Slightly Reduced Transit Connectivity and Operations (Only When an A-BUS is Stalled at Vicinity of Off-Ramp Terminal)	Area of Pavement Surface =172 SF less than Full Standard Option

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

Full Standard Option Description

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.

Narrower Width Option Description

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

Section 3: Options Evaluation and Decision

Performance Comparison and Tradeoffs Discussion

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:

JUST THE FACTS – OPINIONS ARE NOT DEFENSIBLE IN COURT

Design Analysis

Performance of Safety

Safety Performance Discussion

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.

Design Analysis

Operational and Mobility

Operational and Mobility Discussion

Section 3: Options Evaluation and Decision

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".

Performance Discussion of Contextual Need CN4. Use the CN# from Section 1.

Design Analysis

Mitigation Measures

Mitigation Measures Discussion

Section 3: Options Evaluation and Decision

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.

Design Analysis

Preferred option and reasoning

Reasoning for Preferred Option Selection

Section 3: Options Evaluation and Decision

Preferred option and reasoning for selecting the preferred option:

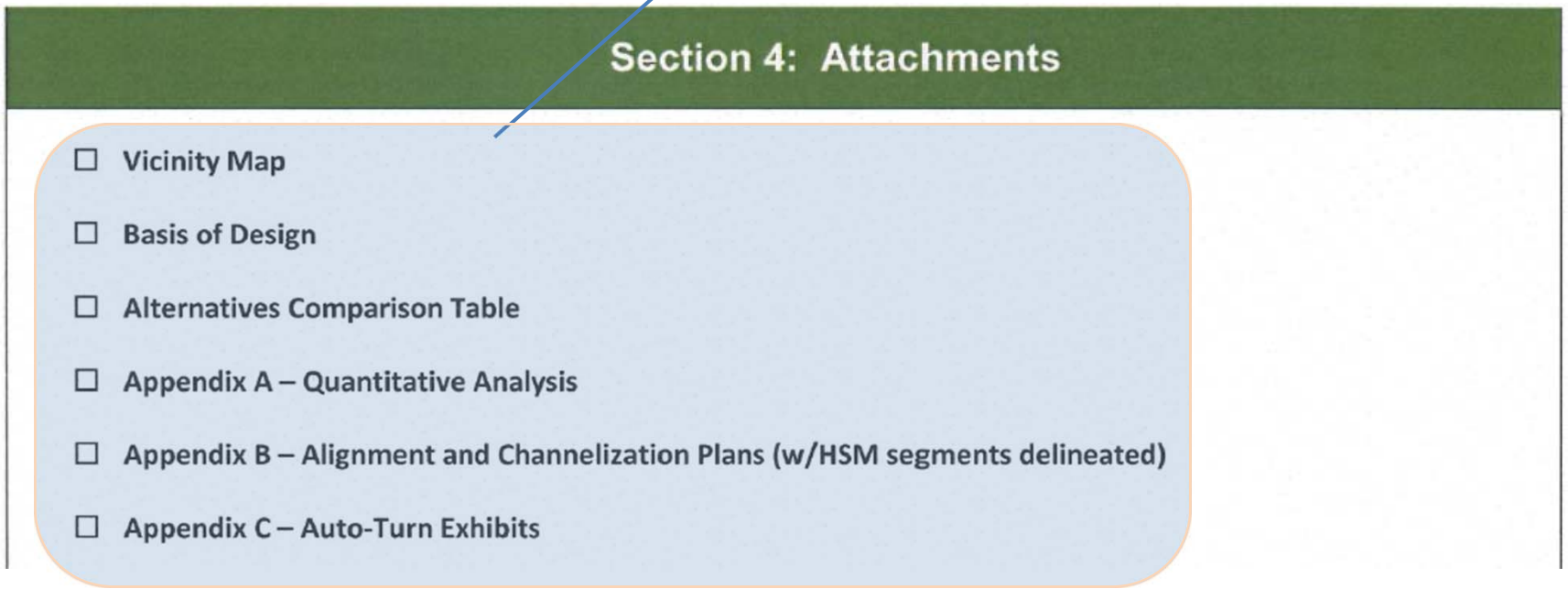
The selection of the **Narrower Width Option** can be summarized as providing greater safety performance while trading off slightly reduced operation l performance at the ramp terminal. The Narrower Width Option to reduce shoulder widths and not increase traveled way width at turning roadways at the 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).

Preferred Option: Narrower Width Option

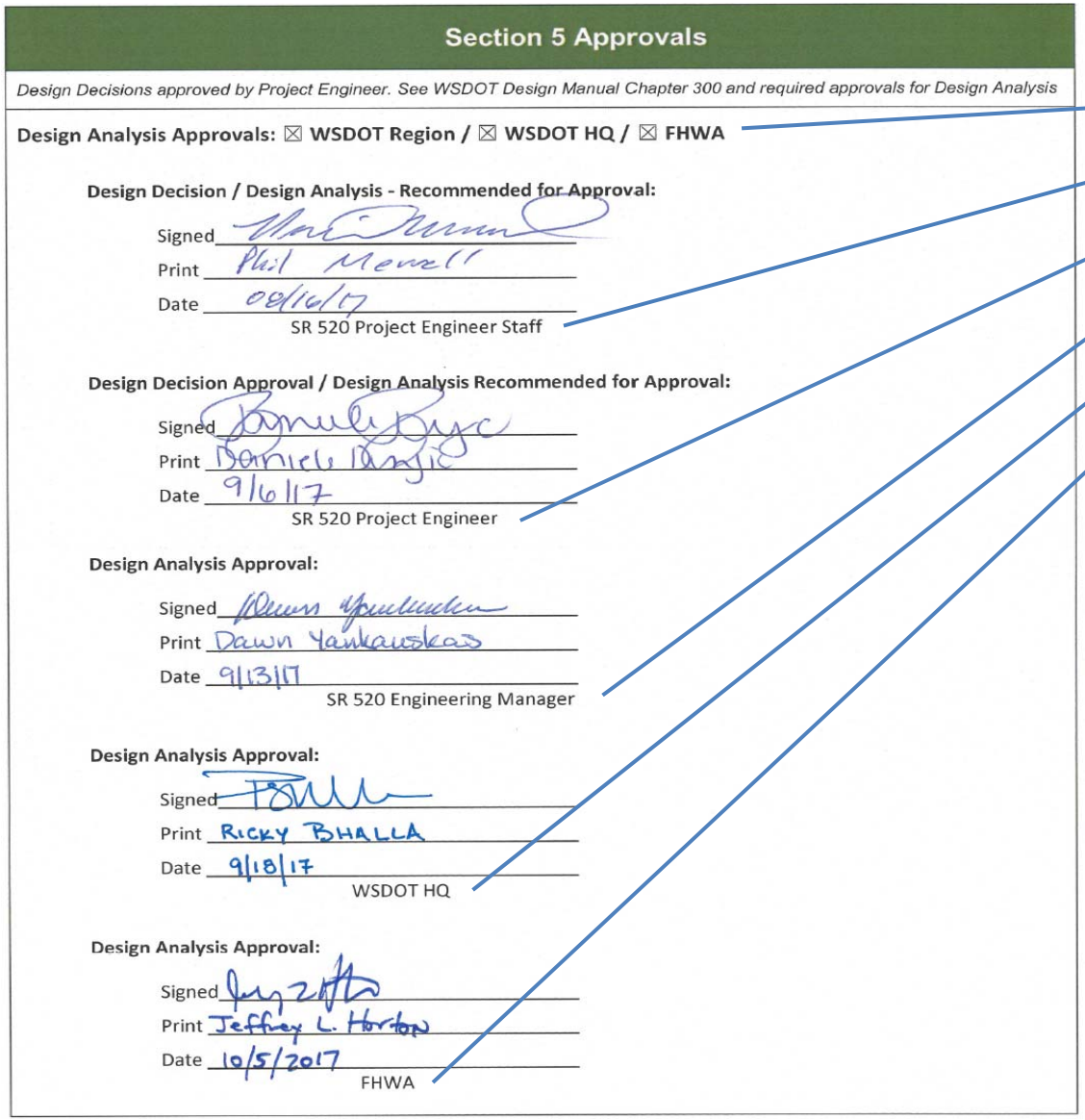
Design Analysis

Section 4: Attachments

Attachments Needed for the Design Analysis



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
Print Phil Mercer
Date 09/16/17
SR 520 Project Engineer Staff

Design Decision Approval / Design Analysis Recommended for Approval:

Signed
Print Daniela Bunjic
Date 9/6/17
SR 520 Project Engineer

Design Analysis Approval:

Signed
Print Dawn Yankauskas
Date 9/13/17
SR 520 Engineering Manager

Design Analysis Approval:

Signed
Print RICKY BHALLA
Date 9/18/17
WSDOT HQ

Design Analysis Approval:

Signed
Print Jeffrey L. Horton
Date 10/5/2017
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

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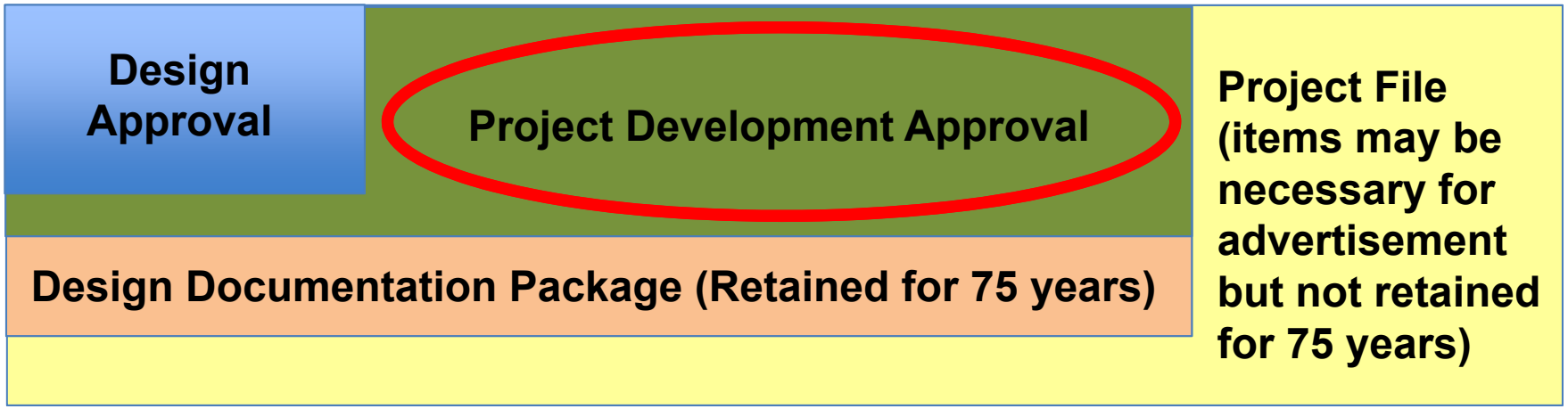
Design Documentation

Project Development Approval

Design Documentation Package



Design Approval

- Stamped Cover Sheet
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- 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 Evaluation
- 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:

Description	DM Ref.	Comments
PROJECT DEVELOPMENT APPROVAL DOCUMENTS		
Stamped Cover Sheet*	300.04(2)	
Project Development Approval Memorandum Describing the Project	300.04(2)	
Project Vicinity Map	PPM 400.06(4)	
Any Design Approval items listed above that have been revised or added	300.04(1)	
NEPA Approvals	300.02(1), 300.06(1)(b)	
SEPA Approvals	300.02(1), 300.06(1)(b)	

* 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 Safety 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:

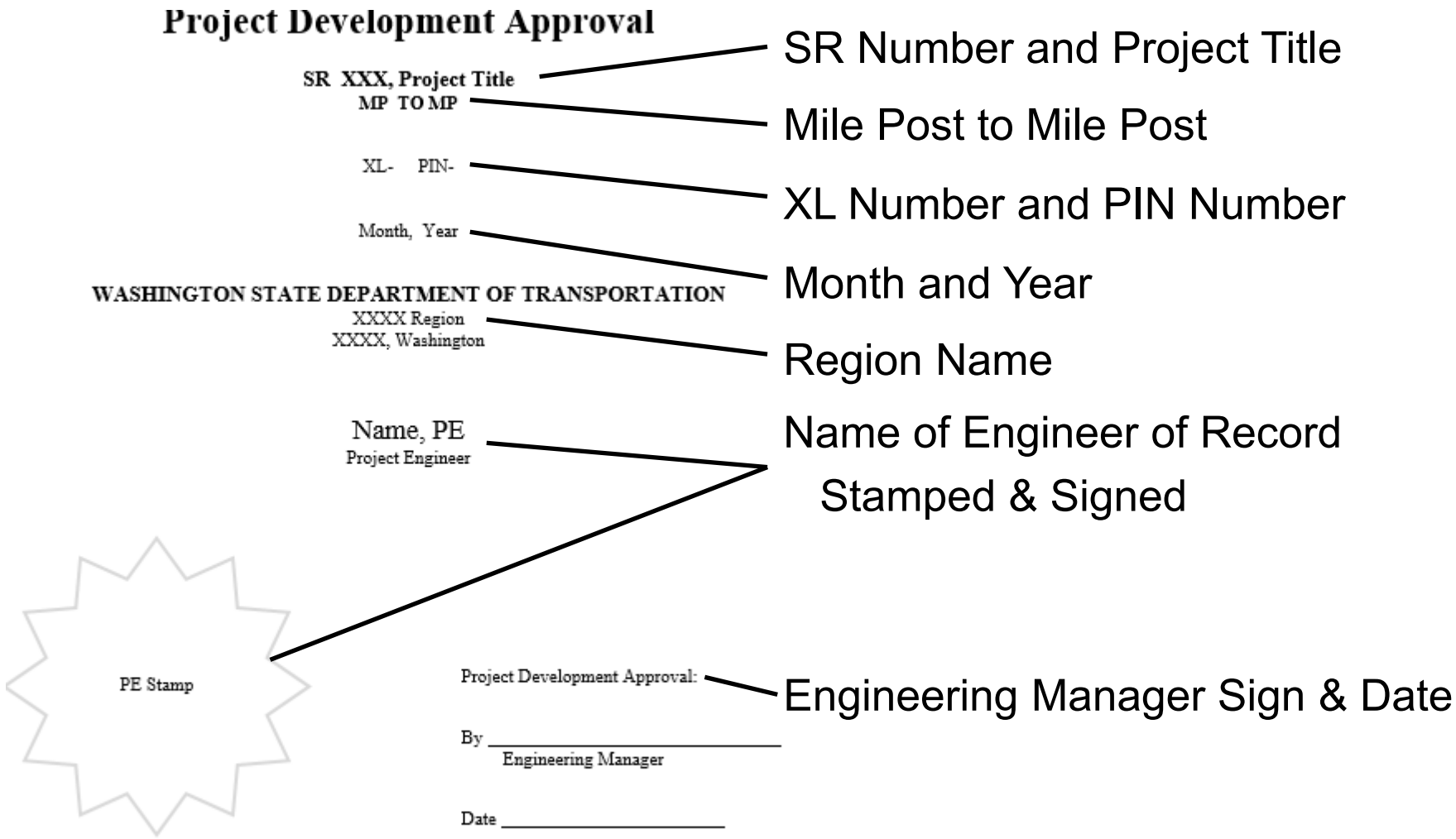
http://www.wsdot.wa.gov/publications/fulltext/design/ASDE/PDA_Memo.docx

- 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/Access Revision 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



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

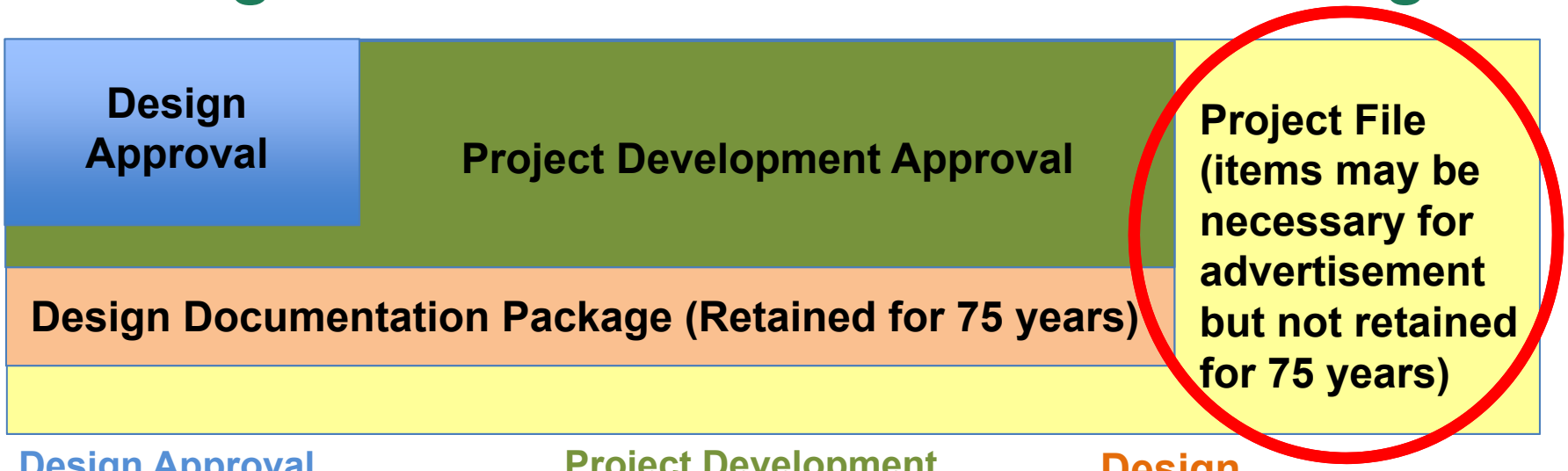
Design Build Projects

- 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 Evaluation
- 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

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.)

Description	Ref.	Comments/Action Strategy/Approvals
Public Agency Coordination	210	
Affidavits	210	
Prehearing Packets	210	
Public Agency Coordination	210	
Open Houses	210	
Hearings	210	

Project File

Comments / Action Strategy / Approvals

Description	Ref.	Comments/Action Strategy/Approvals
Public Agency Coordination	210	
Affidavits	210	
Prehearing Packets	210	
Public Agency Coordination	210	

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

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 - Annually

Design & PS&E Process Review

Focus Areas

- Determined jointly by WSDOT & FHWA

What could be Reviewed?

- Design Documentation Package
  - Basis of Design
  - Alternatives Comparison Table
  - Design Parameters Worksheet
  - Design Analyses and/or Maximum Extent Feasible
  - Basis of Estimate
- Project Plans and Specifications
- Estimate Backup and Engineer's Estimate
- Region Quality Management Plan

When is it Reviewed?

- Projects that have been awarded within the last year

Document Review Process

Plan

- Identify focus areas
- Work with Region to select projects
- Region gathers Design Documentation Package

Conduct

- Short introductory meeting with PE and Design Team Leader
- ASDE and FHWA Area Engineer go through documentation
- Design Team Leader answers questions and clarify issues
- Provide informal feedback and discuss any findings

Report

- Draft report 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

Need Help?

Contact Info and Assignments

ASSIGNMENTS					
ASDE	Vacant 360-705-7272	Dean Moon 360-705-7237	Jim Mahugh 360-705-7245	Scott Zeller 360-705-7253	Kevin Miller Olympia: (360) 705-7236 Vancouver: (360) 905-1559
Liaison	Samih Shilbayeh 360-705-7589	N/A	N/A	N/A	N/A
Region & Mega Project Assign-ments	SW Region SC Region SR 520	NWR – (except John Chi's area)	Eastern Region Sound Transit AWV 405	Olympic Region Gateway Program WSF	NWR – John Chi's area NC Region
Expertise	Design/Build	PDMSG	Safety Training	ADA Policy	Managed Lanes

The End

THANK YOU!

Don’t forget to demonstrate where to find the training slides on the Internet.