Balancing uncertainty: Estimating and managing our capital program

Joint Transportation Committee

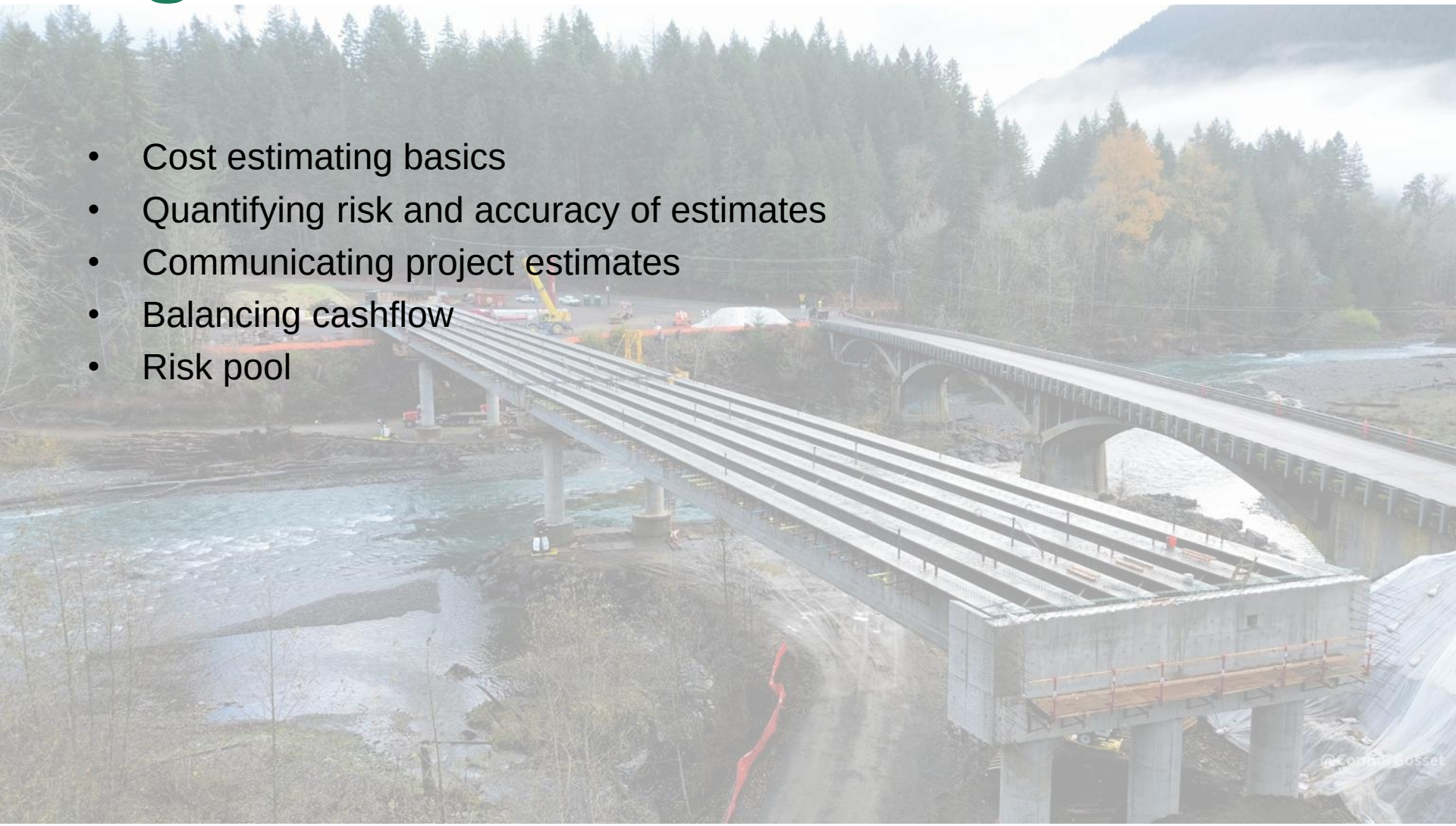
Mark Gaines, WSDOT State Design Engineer
Troy Suing, WSDOT CPDM Director
December 3, 2025

Julie Meredith, Secretary of Transportation
Mike Gribner, Deputy Secretary of Transportation
Steve Nevey, Deputy Secretary of Transportation – WA State Ferries

Proviso Language

(31) The legislature intends to evaluate the state's approach to estimating capital project costs and risks, and to explore pooling risk. The department must present to the joint transportation committee on its cost estimating policies and considerations for creating a project risk pool before the 2026 legislative session.

Agenda



- Cost estimating basics
- Quantifying risk and accuracy of estimates
- Communicating project estimates
- Balancing cashflow
- Risk pool

Cost estimating basics

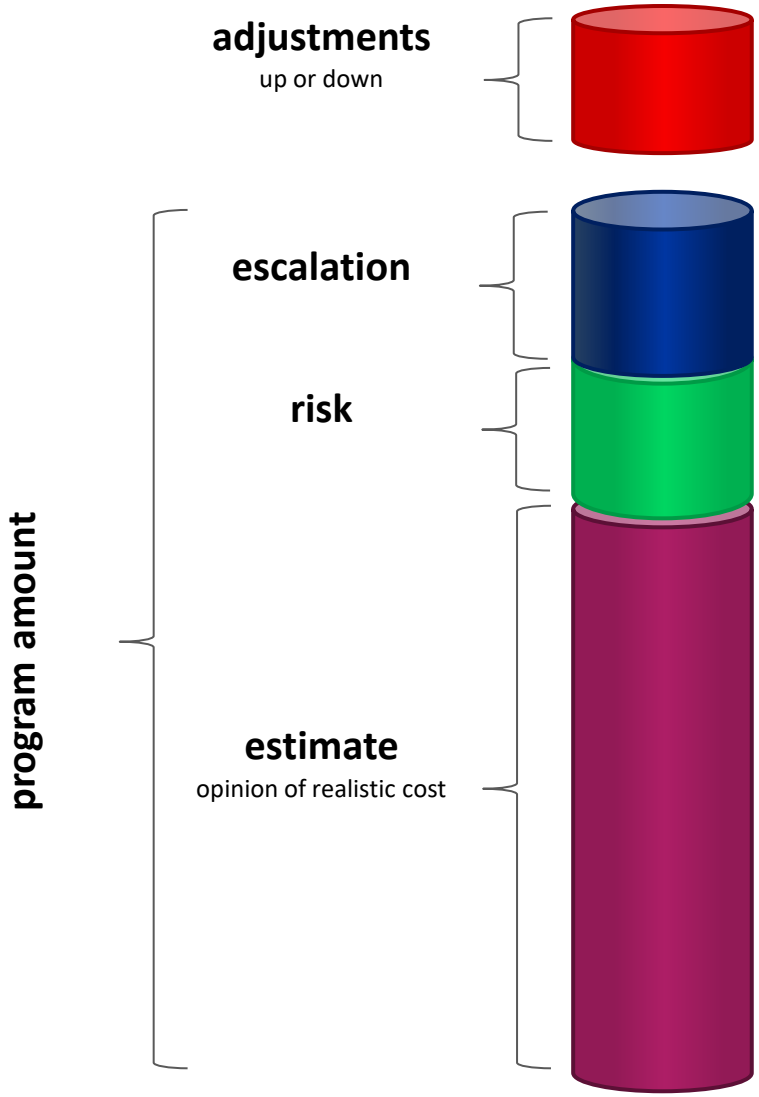
Design-Bid-Build

- Projects are designed to 100%
- Most risks are mitigated during the design effort
- Competitive bid process to select the contractor
- Project is awarded to the lowest responsive bidder

Design-Build

- Project is designed to ~20% level
- Selection process used to select the design-builder
- A price is provided to complete the design and build the project
- Significant risk is transferred to the design-build team

Cost estimating basics



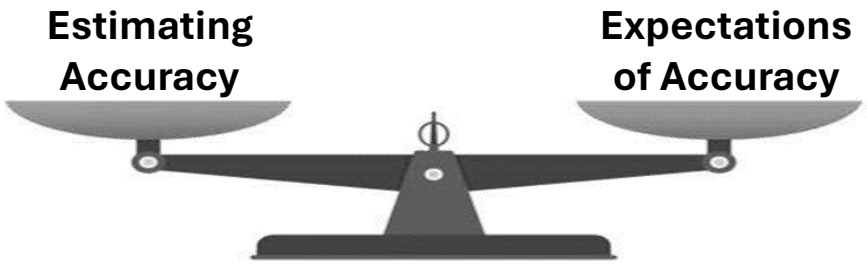
unknown risks	revealed as encountered
escalation	inflation policy
known risks	risk register
base estimate	objective neutral and unbiased documented

How WSDOT quantifies risk

Total Project Size Includes PE, RW, CN (M = million)	**Minimum Risk Management Process Required** If a value engineering study is required, coordinate with risk-based estimating.
Qualitative, QL Risk Assessment	
$20 M or less	Project teams may use the Qualitative Spreadsheet or their own format as preferred. No matter the format, the following information must be included: risk name, risk description, risk trigger, classification (threat or opportunity), impact, and probability.
Quantitative, QT Risk Assessment	
$20 M to $50 M	**Risk-Based Estimating Meeting** The project team convenes to identify and assess project risks, potentially including other participants. The analysis can be qualitative, or quantitative utilizing WSDOT's Project Risk Analysis Model (PRAM). Support is available from the HQ Design Office.
$50 M to $200 M	**Cost Risk Assessment (CRA)** The project team and subject matter experts collaboratively assess cost and schedule estimates, identifying risks in a structured review. These inputs feed into a Monte Carlo Analysis model that integrates cost and schedule risk. For high-risk items, independent cost estimation and input from industry experts is ***recommended***.
$200 M or more	**Cost Estimate Validation Process (CEVP®)** The project team and independent subject matter experts collaboratively review and validate cost and schedule estimates, identifying risks in a structured review. These inputs feed into a Monte Carlo Analysis model that integrates cost and schedule risk. For high-risk items, independent cost estimation and input from industry experts is ***required***.

Table taken from WSDOT Project Delivery Memo #25-01 – Project Risk Management and Risk-Based Estimating

Estimating Accuracy



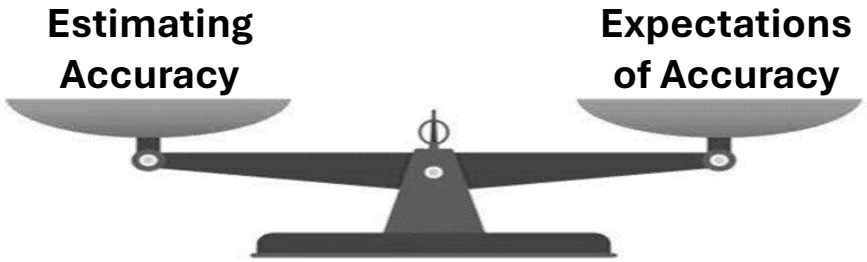
Traditional Design-Bid-Build: EE should be within 10% of lowest bid.

WSDOT is very good at this:

			Engineer's Estimate	Low Bid	Difference	% over/under
7/30/2025	0.7 Miles E of Appleton Rd to School Dr Trail Improvements (Set-Aside)	SW	$210,244	$293,022	$82,779	39.4%
8/6/2025	ER Transportation Management Center Relocation	FAC	$1,195,850	$1,500,000	$304,150	25.4%
8/13/2025	Eagle Harbor Maintenance Facility Welding Shop Building Replacement	WSF	$7,400,806	$12,522,640	$5,121,835	69.2%
8/13/2025	Rimrock Vicinity Emergency Repair	SC	$1,250,405	$1,045,045	-$205,359	-16.4%
8/27/2025	Crawford Bridge Pedestrian Illumination	SW	$415,552	$323,000	-$92,552	-22.3%
9/10/2025	EWC 2025 Demo No. 1 (Small Works Roster)	NC	$188,118	$94,042	-$94,076	-50.0%
10/29/2025	Busch Bridge at Port of Almota - Bridge Rehab	ER	$1,521,887	$1,271,028	-$250,859	-16.5%
10/29/2025	Bridge Over Third Ave SW - Emer. Girder Replacement	NW	$1,760,062	$1,637,355	-$122,707	-7.0%
			$4,003,065,643	**$4,031,150,912**	**$27,246,830**	**0.7%**

Since 2017 (~900 projects) overall bid prices ~1% more than EE

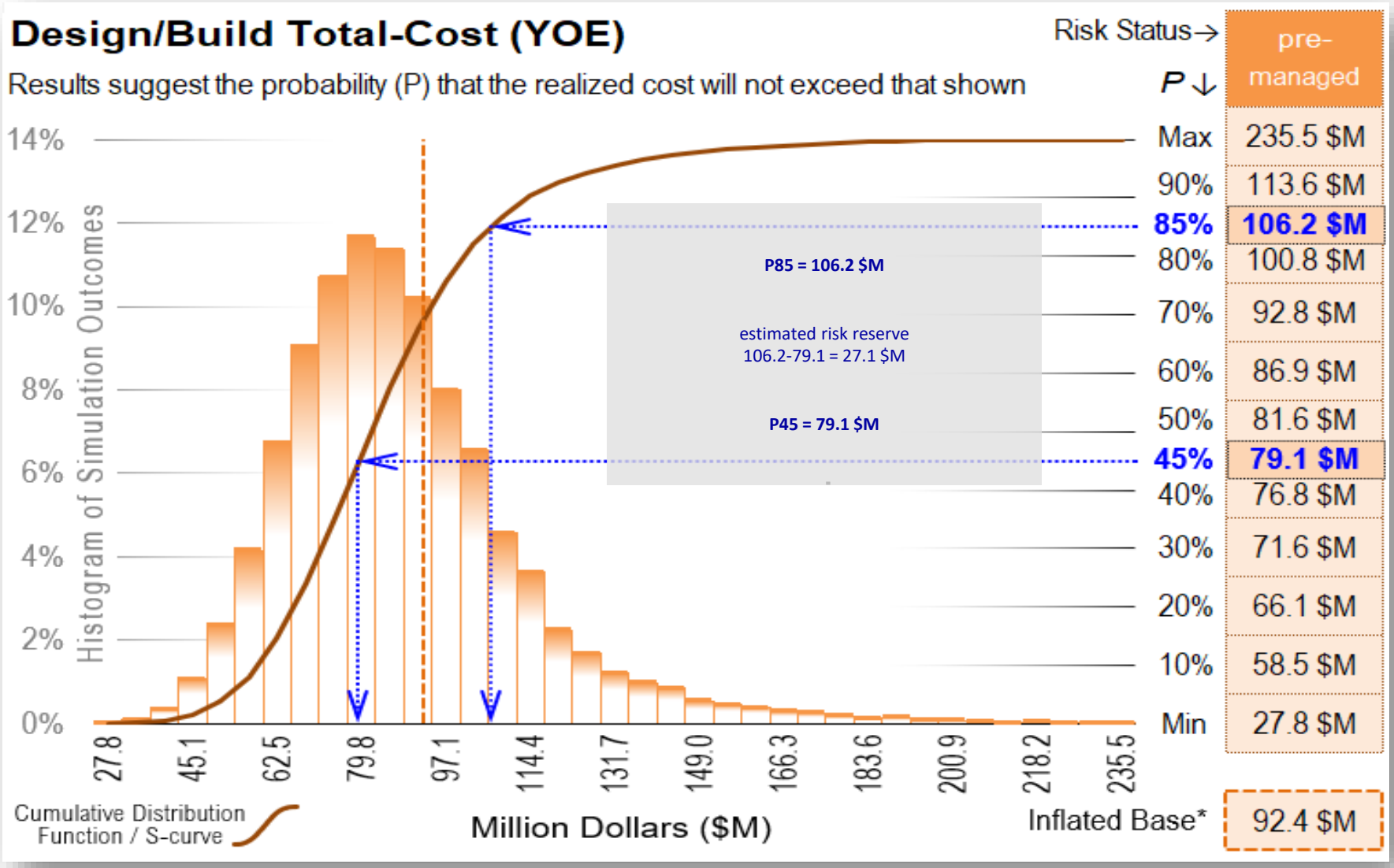
Estimating Accuracy



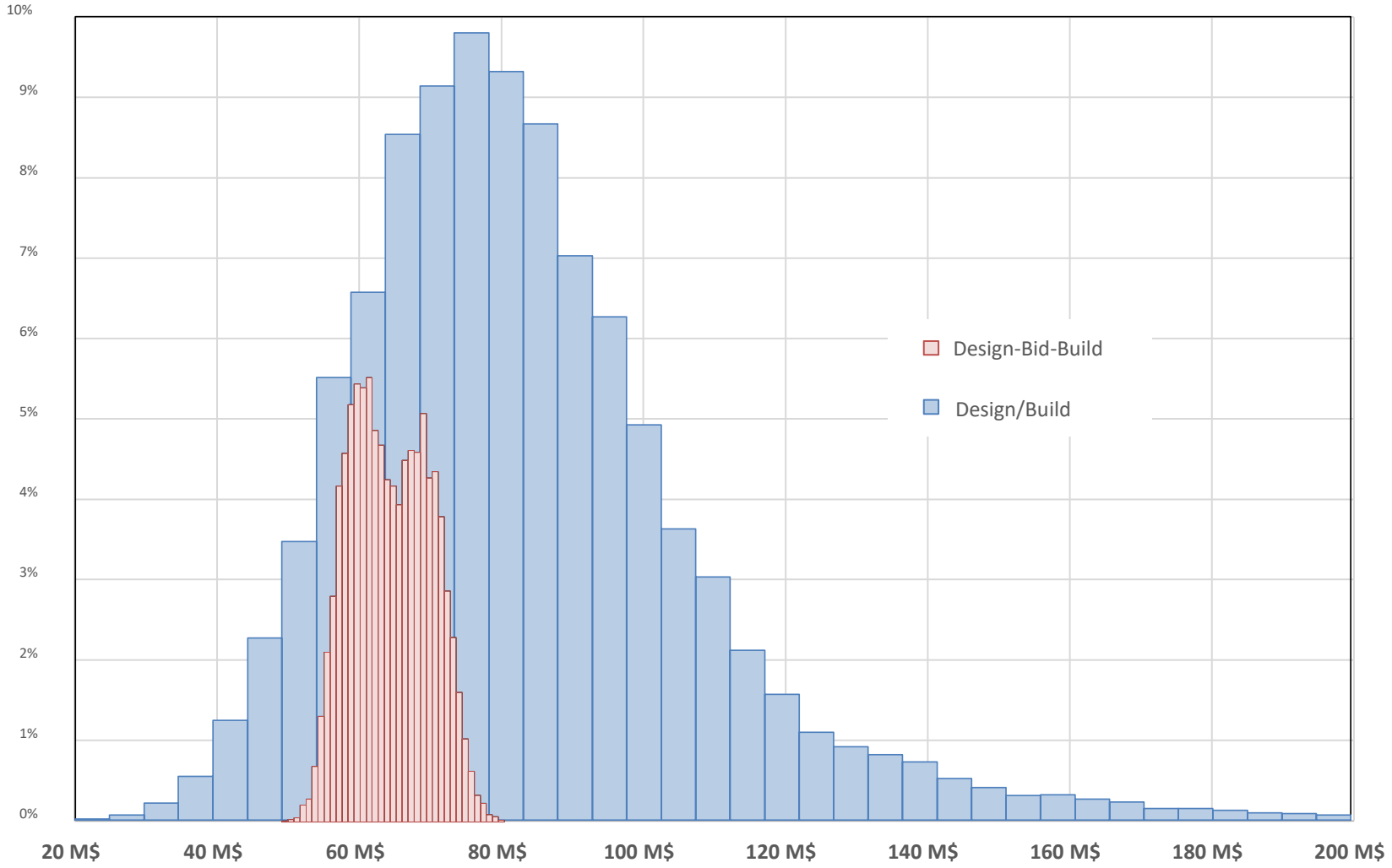
Design-Build Highway Projects – “it’s complicated”

- Very complex projects, often in dense urban areas
- Long duration (3+ construction seasons not uncommon)
- Significant risk transferred to the design-builder
- Limited pool of contractors
- Competition in the heavy civil market (especially in Puget Sound)
- Estimates finalized 12-18 months before bids are received

Design-Build risk distribution



Risk profiles based on delivery method



Design-build estimating accuracy

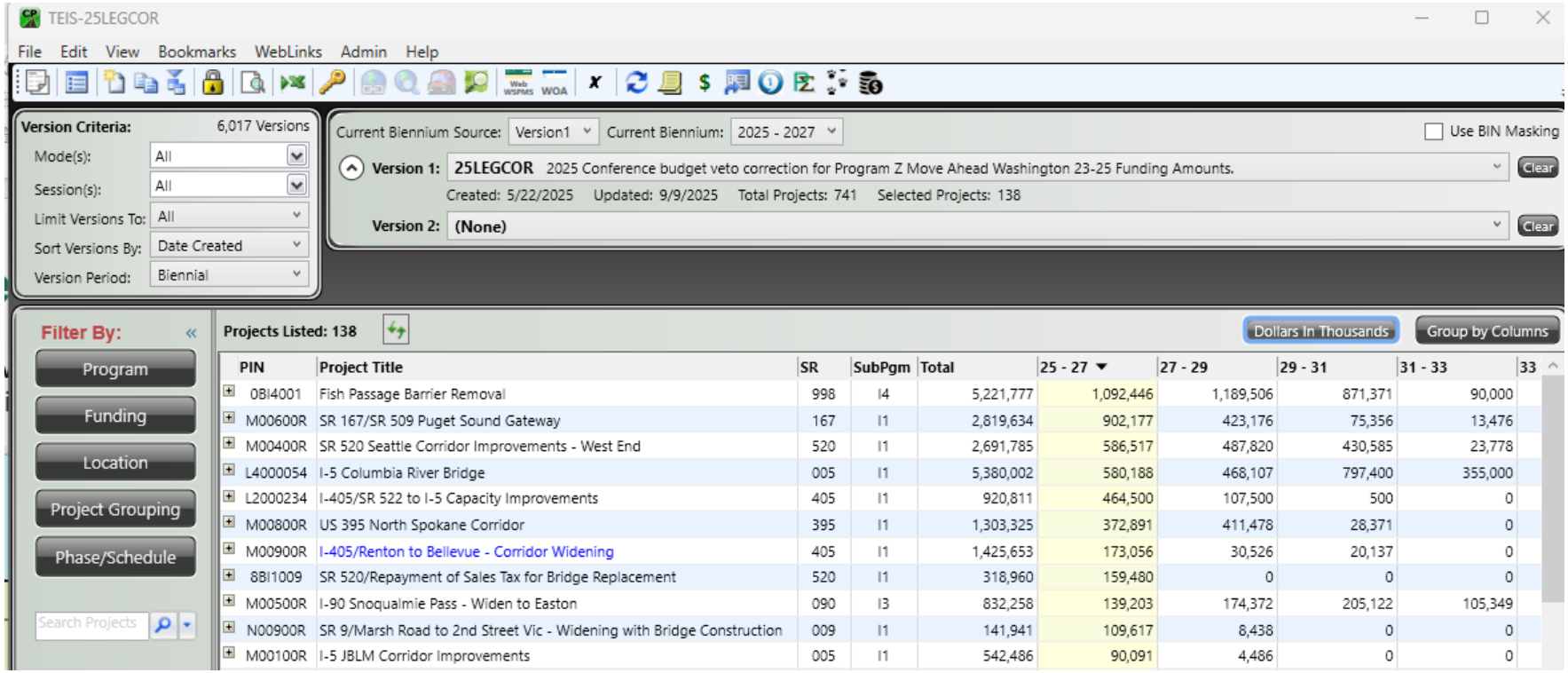
source	Project Development Phase	Design Maturity	End Usage *Purpose of Estimate*	Methodology	Expected Accuracy
1	Scoping	10% to 30%	Budget Authorization or Control Capital Improvement & Preservation Plan (CIPP)	mixed, parametric, bid-based, risk-based	-30% to +50%
2	AACEI Estimate Class 3	10% to 40%	Budget Authorization or Control	mixed, primarily stochastic	2 to 6 -20% to +60%
3	Pre-procurement	10% to 30%	understand project needs, aid decision-making related to project funding, resource allocation, and planning	varies	25%

1. WSDOT Cost Estimating Manual, Exhibit 4-2 Cost Estimating Matrix, November 2024

2. AACEI Recommended Practice 17R97, August 2020, Table 1 2 to 6, Index value of -10/+10 gives -20% to +60%

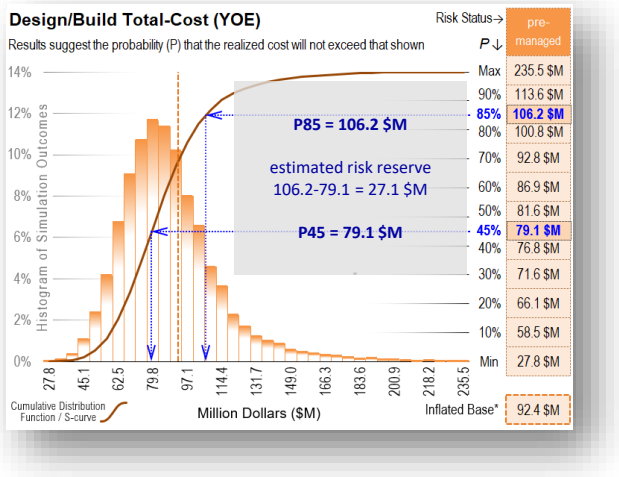
3. Challenges in EE for Best Value DB Highway Projects, 2021, Gaikwad, Calahorra-Jimenez, Moenaar, Torres-Machi

Project Information Submission

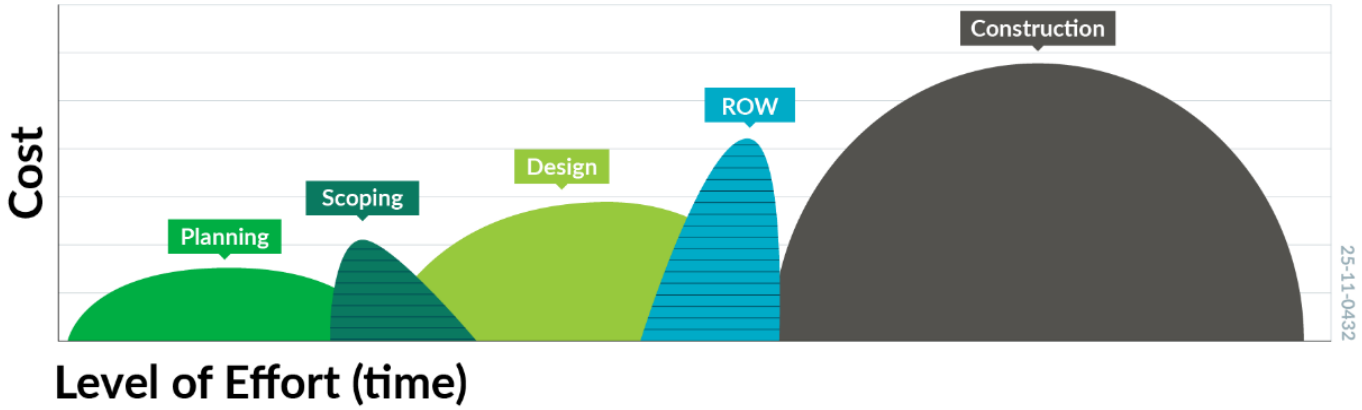


PIN	Project Title	SR	SubPgm	Total	25 - 27	27 - 29	29 - 31	31 - 33	33
0BI4001	Fish Passage Barrier Removal	998	I4	5,221,777	1,092,446	1,189,506	871,371	90,000	
M00600R	SR 167/SR 509 Puget Sound Gateway	167	I1	2,819,634	902,177	423,176	75,356	13,476	
M00400R	SR 520 Seattle Corridor Improvements - West End	520	I1	2,691,785	586,517	487,820	430,585	23,778	
L4000054	I-5 Columbia River Bridge	005	I1	5,380,002	580,188	468,107	797,400	355,000	
L2000234	I-405/SR 522 to I-5 Capacity Improvements	405	I1	920,811	464,500	107,500	500	0	
M00800R	US 395 North Spokane Corridor	395	I1	1,303,325	372,891	411,478	28,371	0	
M00900R	I-405/Renton to Bellevue - Corridor Widening	405	I1	1,425,653	173,056	30,526	20,137	0	
8BI1009	SR 520/Repayment of Sales Tax for Bridge Replacement	520	I1	318,960	159,480	0	0	0	
M00500R	I-90 Snoqualmie Pass - Widen to Easton	090	I3	832,258	139,203	174,372	205,122	105,349	
N00900R	SR 9/Marsh Road to 2nd Street Vic - Widening with Bridge Construction	009	I1	141,941	109,617	8,438	0	0	
M00100R	I-5 JBLM Corridor Improvements	005	I1	542,486	90,091	4,486	0	0	

Cash Flow and Risk



Project Cost Risk Profile



Typical Project Cash Flow

Challenges with Cash Flow Estimating

Challenges include:

Design Phase

- Permit procurement
- Right of way procurement
- Stakeholder Influence

Construction Phase

- Contract type – DBB vs DB
- Contractor payment timing and amount
- Material procurement
- Weather

Overall

System favors conservative cash flow estimates

Cash Flow Development

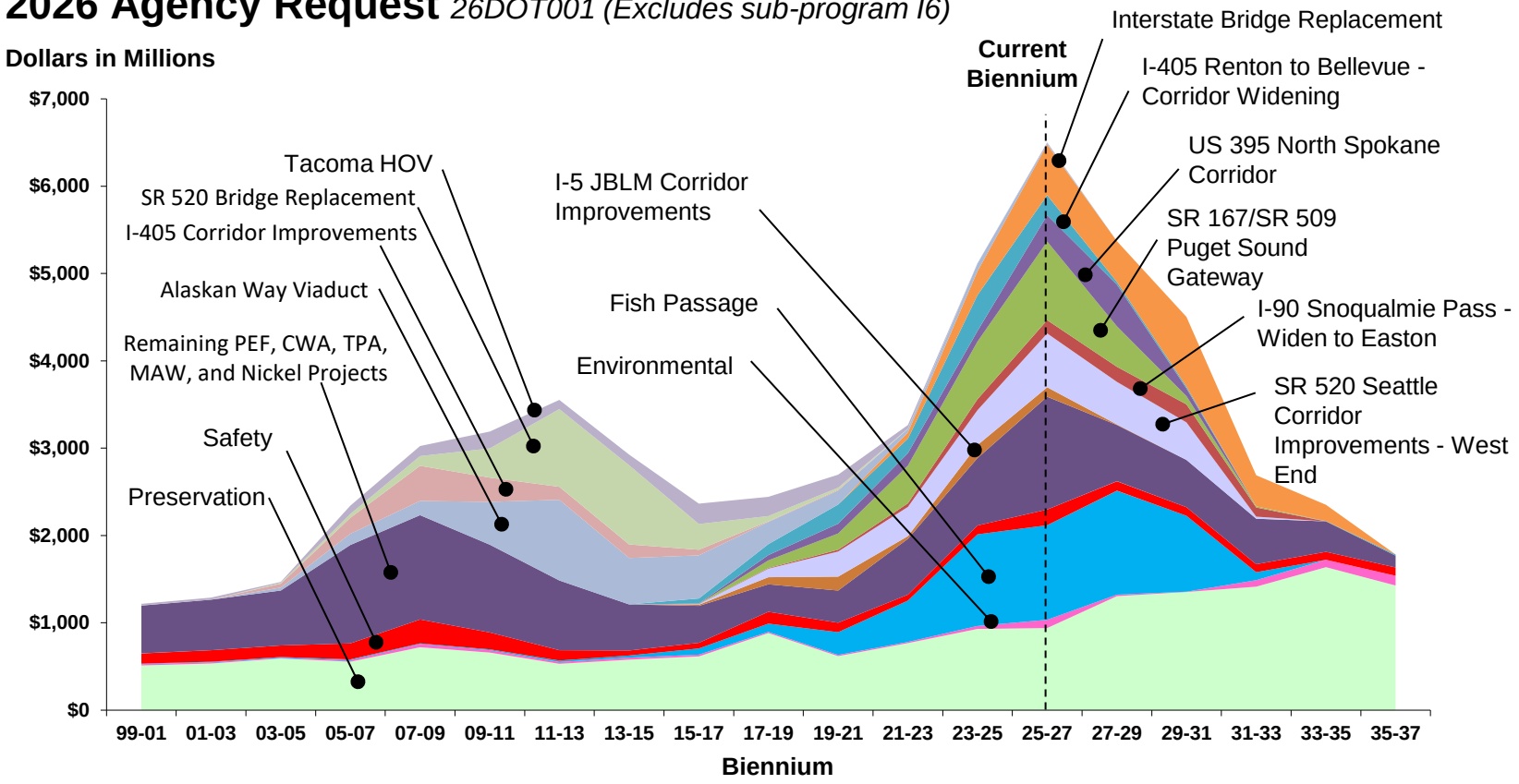
- Estimated monthly expenditures – WSDOT labor, consultant labor, contractor payments
- Project cash flow is aged to completion – ‘Estimate at Completion’

Capital Connect
Funding Plan (Cost Management - Cash Flow)
WSDOT
Funding Plan, as of: 10/16/2025
Expenditures, as of: 09/2025

						Bien.	2023-25 Bien. $1,726,998,197						
						FY	FY 2025 $1,090,154,535						
						FFY	FFY 2025 $1,031,646,780						
						Cal Year	2025 CY $1,301,941,788						
						Mo. No.	4	5	6	7	8	9	
						Mo.	Apr	May	Jun	July	Aug	Sep	
Leg. Project			Capital Project		Work Phase	375,237,219	83,435,724	72,622,308	175,746,072	21,300,447	90,804,812	145,828,184	
Sub Prog	BIN	PME	CPN	CPN Title	Work Phase Title	Prior	2504	2505	2506	2507	2508	2509	
P3	0BP3001	400521K	D00521K	I-5/Koontz Road Bridge - Emergency Bridge	D00521K-3	27,155							
P3	0BP3001	400521K	D00521K	I-5/Koontz Road Bridge - Emergency Bridge	D00521K-1	340,843							
D3	D309701	888813E	S88813E	Corson Ave RHQ Bldg 1 - Canopy Roof	S88813E-3	71,157							
D3	D309701	888813E	S88813E	Corson Ave RHQ Bldg 1 - Canopy Roof	S88813E-1	4,353							
P1	0BP1002	300820H,	C00820H	SR 8/US 12 to US 101 - Paving	C00820H-3	2,371,801	20	0	-	-	-	-	
I2	0BI2010	153003S	A53003S	SR 530/59th Ave NE & 211th Pl NE -	A53003S-3	272,509	545	14	85	1,315	383	43	
P1	0BP1002	300820H,	C00820H	SR 8/US 12 to US 101 - Paving	C00820H-1	452,373	-	-	-				
I2	0BI2010	153003S	A53003S	SR 530/59th Ave NE & 211th Pl NE -	A53003S-1	420,150	-	-	-	-	-	-	
I2	0BI2010	153003S	A53003S	SR 530/59th Ave NE & 211th Pl NE -	A53003T-1	42,341	-	-	-	-	-	-	
I4	0BI4001	301228H	C01228H	US 12 & SR 8 Grays Harbor County -	C01228H-3	1,637,634	2,153,367	2,076,383	2,321,338	136,511	1,235,336	827,085	
I2, P1	0BI2011,	200202F,	B00003G	US 2 & US 97/Leavenworth & N of Blewett	B00003G-3	4,340,865	23,357	12,646	84,293	6,195	139	35,351	
I2, P1	0BI2011,	200202F,	B00003G	US 2 & US 97/Leavenworth & N of Blewett	B00003G-1	790,763	-	-	-	-	-	-	

WSDOT Highway Construction Program with Revenue Packages

2026 Agency Request *26DOT001 (Excludes sub-program I6)*



‘Risk’ Pool Considerations

Assumptions:

- Pool held in ‘unallotted’ status until needed during biennium
- Accountability process to utilize pool on projects

Things to consider:

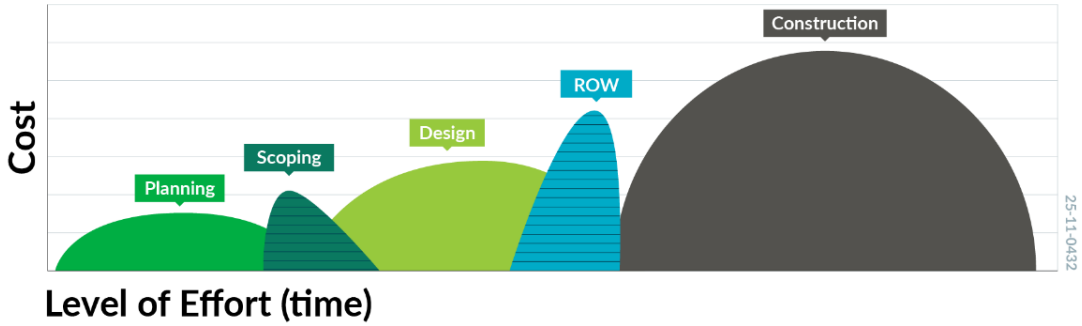
- No change to the overall program management and risk
- Unallotted amount of the pool will still require an appropriation
- Proviso vs Programmatic Programs
- Contract type DB vs DBB
- Nothing ‘freed up’ - Reappropriated I funds are ultimately needed for those projects

Better Cash Flow Management

- Continue Implementing Risk-Based Estimating

  Ensure realistic initial total budget

- Continue Focus on Realistic Project Scheduling/Cash Flow



Questions?

Mark Gaines, PE
State Design Engineer
Mark.Gaines@wsdot.wa.gov
(360) 908-2113

Troy Suing, PE
Director, Capital Program
Development & Management
Troy.Suing@wsdot.wa.gov
(360) 705-7121