



# Joint Transportation Committee

## Efficiencies in the Construction and Operation of State Transportation Projects

Advisory Panel Meeting #3 | Meeting Materials  
October 29, 2013

# October 29 Advisory Panel Meeting

## Objectives



- Provide an update on progress and next steps
- Continue review of analysis of WSDOT project costs and expenditure history for key drivers
- Exploration of:
  - Permitting, Environmental Review and Mitigation
  - Contracting
  - Cost comparisons
- Discuss next steps

# Comparative Costs Approach



- A key question posed in this study is whether, and to what degree, WSDOT projects are more costly than those in other states
- Given the challenges of ensuring that project comparisons reflect truly comparable projects, we have chosen to address this question in two ways:
  - Identify key driver-level differences which could lead to significant cost differences between WSDOT projects and projects elsewhere
  - Conduct literature review and where appropriate provide a high level assessment of comparable project costs across states
- The driver-level analysis will explore how each cost driver impacts project costs overall and puts this into a broader state to state comparison
- Since data availability will be an issue in the driver-level analysis, we will ensure that every driver includes a comparison with Oregon and Utah to provide a complete top-to-bottom review with two western peer states

# Summary of Issues Alternatives



## Alternatives Discussed at Meeting 2

Sales & Use Tax	1. Exempt projects on state-owned highways (all materials & total contract amount)
Sales & Use Tax	2. Reinstate public road construction exemption to state-owned highways (tax all materials – no tax on total contract amount)
Sales & Use Tax	3. Direct sales & use tax receipts to transportation
Prevailing Wage	1. Exempt WSDOT projects from state prevailing wage act (retain federal prevailing wage on federal-aid projects)
Prevailing Wage	2. Exempt WSDOT federal-aid projects from state prevailing wage act (federal rate only on federal-aid projects)
Prevailing Wage	3. Set threshold for WSDOT projects below which there is no state prevailing wage
Prevailing Wage	4. Use federal rate as state rate
Prevailing Wage	5. Other alternatives to set state rate <ul style="list-style-type: none"> <li>a) Annual survey</li> <li>b) Collective bargaining agreements</li> <li>c) Highway category</li> </ul>

# Summary of Issues Alternatives



## Alternatives to Discuss at Meeting 3

Contracting	1. Grant broad authority to WSDOT to determine project delivery methods
Contracting	2. Modification to existing WSDOT authority for Design-Build contracting
Contracting	3. Facilitate GC/CM project delivery for WSDOT projects
Contracting	4. Introduce Expedited Delivery Contracting (EDC)
Contracting	5. Consider opportunities to accept contractor warranties in lieu of some inspections
Contracting	6. Consider giving design-build contractors additional design flexibility to support innovation and cost containment
Environmental Review	1. Allow smaller projects that qualify for a NEPA categorical exclusion but not a SEPA categorical exemption to submit NEAP documentation only (and not the SEPA checklist).
Environmental Review	2. Expand SEPA exemptions to better match the NEPA categorical exclusions.

# Summary of Issues

## Open Questions



### Issues under development, still awaiting data or other information

Apprenticeship Programs	Still in development
Cost Comparison	Working on getting data from Oregon and Utah
Funding	Federal aid requirements; cost of bonding
Right of Way	Waiting on parcel database

# Prevailing Wage Follow-up

## State & Federal Scope



*Question: Why does the State prevailing wage have broader requirements than the Davis-Bacon Act?*

### Definition of State Prevailing Wage Broader than Davis-Bacon

- State RCW 39.12: Provides for prevailing wages to be paid to **laborers, workers, or mechanics**, upon **all** public works
- Davis-Bacon Act: Provides for “payment of prevailing wages to **mechanics and laborers** employed **directly on the site of work**”

Sample Area	State/Federal	Court Case
Off-site production of custom equipment	State: Applies if customer made for the public work Federal: Applies if nexus to the public work project (i.e. locality, relationship, character of project)	Washington State Supreme Court Everett Concrete Products vs. L&I 1988 Tunnel liners – Mt. Baker Ridge
Delivery of gravel etc.	State: Applies if not being delivered to a stockpile because incorporated into the public work Federal: Does not apply	Washington State Supreme Court Silverstreak Inc. vs. L&I 2007 End dump truck drivers SeaTac 3 <sup>rd</sup> runway
Construction site surveyors	State: Applies as they are workers on a public work Federal: Does not apply	Gov. Ruling 2012 affirm L&I LSAW Petition to Repeal WAC 296-127-01396 “Any changes should be made by the legislature”

# Prevailing Wage Follow-up

## State & Federal Scope



### Cost

- Silverstreak Case - \$500,000 differences in wages to end dump truck drivers
- No other specific studies found

### Out-of-State Competition

- Complaints from in-state firms that the prevailing wage requirements can favor out-of-state companies
  - Land Surveyors Association of Washington – in complaint note that Oregon specifically excludes land surveys from state prevailing wage laws as does the Davis-Bacon Act (not clear about competitive situation)
  - Steel fabricators - [http://www.steeladvice.com/steel\\_advice\\_061.htm](http://www.steeladvice.com/steel_advice_061.htm) - out of state steel fabricators have 20 to 25% cost advantage due to prevailing wage, justifying the added shipping costs

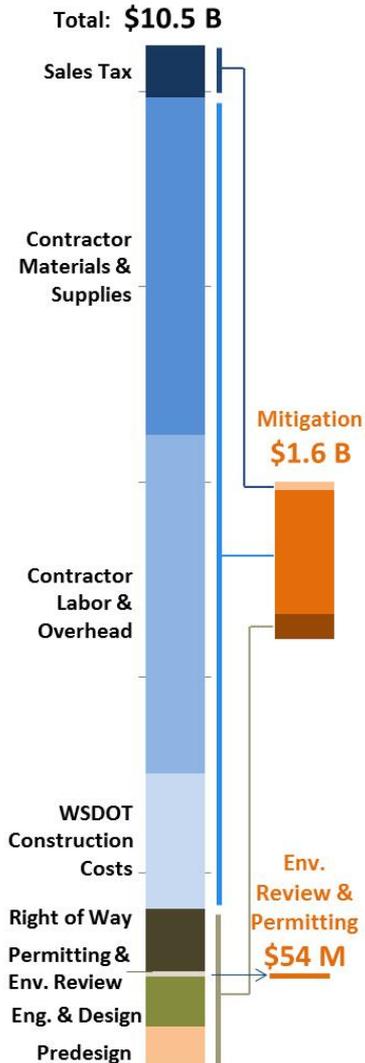
### Legislative Alternative

- Revise RCW 39.12 language so that the construction is more similar to Davis-Bacon Act

Cost Analysis

# **ENVIRONMENTAL REVIEW & PERMITTING**

# Environmental Review and Permitting Introduction



**Environmental review** aids understanding of a project's impacts *consists of the range of proposed activities, alternatives, and impacts to be analyzed in an environmental document, in accordance with SEPA's goals and policies*

**Permitting** provides legal authority to proceed with commitment to address any environmental impacts that need mitigation

**Mitigation** actions taken to avoid, minimize or mitigate environmental impacts

# Environmental Review and Permitting

## Summary of Review & Permitting

	Environmental Review	Permitting
<b>Federal</b>	<ul style="list-style-type: none"> <li>National Environmental Policy Act (NEPA)</li> <li>National Historic Preservation Act Section 106 Concurrence</li> <li>Endangered Species Act (1973) Section 7 Consultation</li> <li>Department of Transportation Act (1966) Section 4(f) Evaluation</li> </ul>	<ul style="list-style-type: none"> <li>Clean Water Act (1972) Section 404</li> <li>Rivers and Harbors Act (1899) Section 10</li> <li>General Bridge Act (1946) Section 9</li> </ul>
<b>State</b>	<ul style="list-style-type: none"> <li>State Environmental Policy Act (SEPA)</li> <li>Noise Assessment</li> <li>Executive Order 05-05</li> <li>NPDES Municipal Permit Compliance</li> </ul>	<ul style="list-style-type: none"> <li>WDFW Hydraulic Project Approval (HPA)</li> <li>NPDES Construction Stormwater General Permits</li> <li>Section 401 Water Quality Certification (ECY)</li> <li>Costal Zone Management Certification (ECY)</li> <li>Aquatic Lands Use Authorization (DNR)</li> <li>Forest Practices (DNR)</li> </ul>
<b>Local</b>	<ul style="list-style-type: none"> <li>Local Noise Ordinances</li> <li>Critical Areas Compliance</li> </ul>	<ul style="list-style-type: none"> <li>Land Use Approvals</li> <li>Shoreline Permits</li> <li>Floodplain Permits</li> <li>Clearing and Grading Permits</li> </ul>

**Note:** Tribal governments also serve as permitting agencies in Washington

# Environmental Review and Permitting

## SEPA Actions

- SEPA Review is required for all state or local agency “actions” not categorically exempt, including:
  - Project Actions:
    - Construction of roads, public buildings, utilities
    - Private construction project that require a state or local permit
  - Non-project Actions:
    - Rules, ordinances or regulations
    - Comprehensive Plans or zoning codes
    - Road, street and highway plans
- WAC 197-11-704
- 17 states plus the District of Columbia and Puerto Rico have state environmental policy acts (see table)

State	Year
CA	1970
CT	1971
DC	1989
GA	1991
HI	1974
IN	1972
MD	1973
MA	1972
MN	1973
MT	1971
NY	1976
NC	1971
PR	1970
SD	1974
VA	1973
WA	1971
WI	1971

# Environmental Review and Permitting

## NEPA Actions



- NEPA Review and documentation are required for all Federal agency “actions” not categorically excluded, including:
  - Federal Projects
  - Issuance of Federal Permits
  - Projects with Federal Funding
  - Projects on Federal Land

# Environmental Review and Permitting

## NEPA/SEPA Integration



- Some projects may require approval from both federal agencies and state or local agencies – requiring review under SEPA and NEPA
- Agencies are permitted (and encouraged) to prepare and issue combined documents that meet the requirements of both
- NEPA and SEPA lead agencies can agree to be co-lead agencies and issue joint NEPA/SEPA documents
- SEPA rules (WAC 197-11-610) allow the use of NEPA documents to meet SEPA requirements
  - A NEPA EA may be adopted to satisfy requirements of a SEPA DNS or an EIS
  - A NEPA EIS may be adopted as a substitute for a SEPA EIS
  - Federal documents may also be incorporated by reference as support for issuance of a SEPA document (WAC 97-11-635)

# Environmental Review and Permitting

## NEPA/SEPA Integration



- NEPA requirements are equal to or more stringent than SEPA requirements
- NEPA requires additional or expanded evaluations of:
  - Environmental Justice
  - Social, Economic, and Relocation
  - Public Lands (Section 4(f), 6(f) and Forests)
  - Farmland and Agriculture
  - Historic, Cultural, and Archeological Resources
- NEPA Review is typically longer
  - DEIS comment period: SEPA: 30 days (as long as 45 days) – NEPA: 45/60/75 days
  - Final Appeal period: SEPA: 7 days – NEPA: 25 days
- NEPA page limit is higher, implying a greater level of expected documentation  
150-300 vs. 75-150

# Environmental Review and Permitting WSDOT Practices



WSDOT has three typical review scenarios:

1. Large projects that use combined NEPA/SEPA documents. In this case, NEPA requirements are used by WSDOT;
2. Projects that are categorically exempt by SEPA and don't require any further SEPA review; and
3. Smaller projects that qualify for a NEPA categorical exclusion but not a SEPA categorical exemption. These require both NEPA categorical exclusion documentation and a SEPA checklist with comment period.

# Environmental Review and Permitting WSDOT Practices



- NEPA guidelines are usually followed by WSDOT so that projects can qualify for federal funding in the future
  - Federal funding could be excluded from some projects - limiting project to SEPA review
  - Process and scope of review are often determined by federal standards
- The level and scope of environmental review are determined through WSDOT procedures and depend on potentially impacted resources
- WSDOT generally takes a conservative approach to the extent and type of environmental documentation
  - In some cases, WSDOT procedures could be modified to decrease scope of reviews, but tradeoffs would have to be considered
  - WSDOT could pursue less intensive review processes (i.e. checklist/EA vs. EIS), but would assume more risk
- Environmental review may increase public acceptance and lead to improvements/efficiencies in overall project design
- Legislative or rule making modifications could change state requirements, but tradeoffs would have to be considered

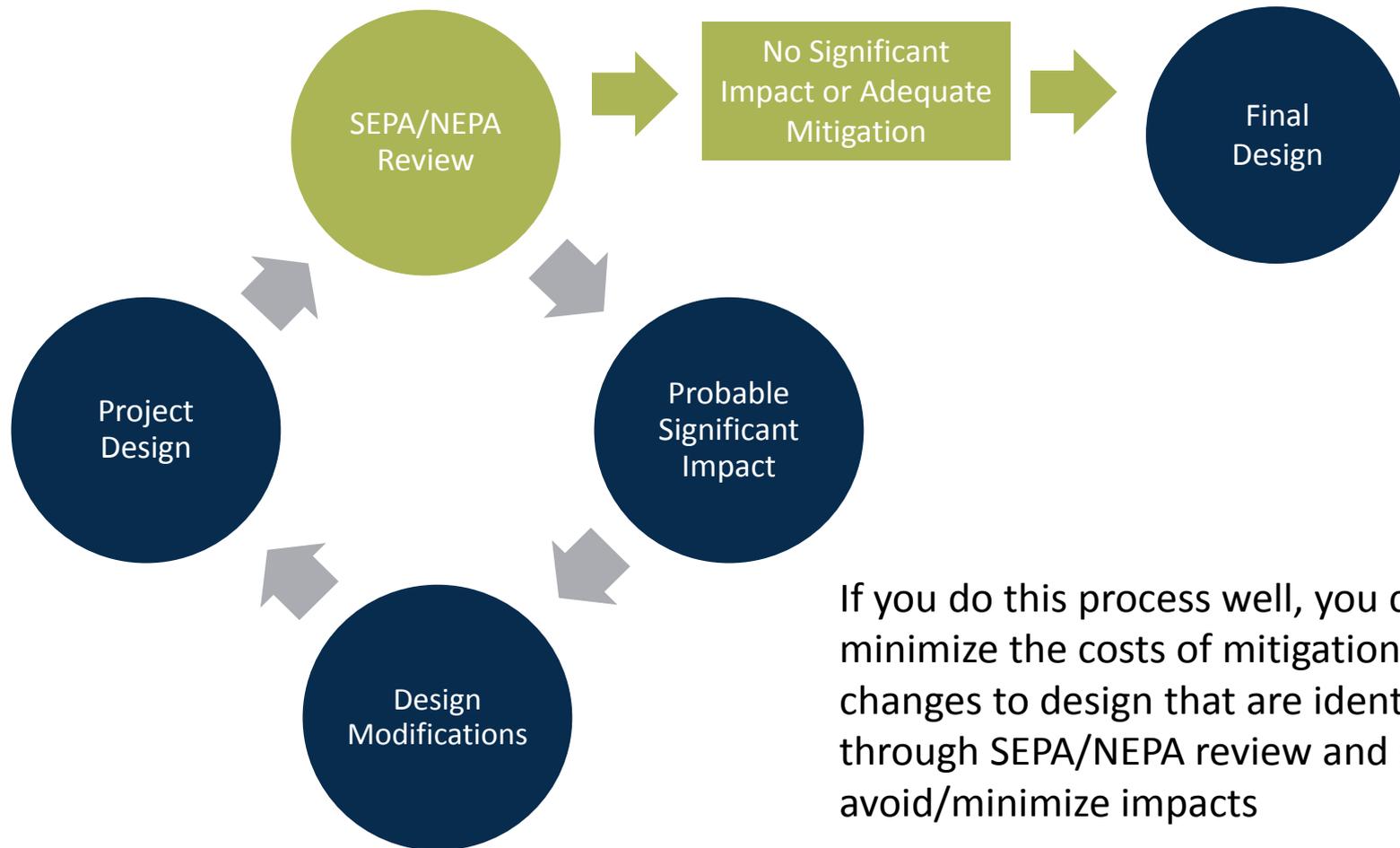
# Environmental Review and Permitting

## Legal Authority: Environmental Review

Federal  
State  
Local

Direction	Administered By	Legal Authority From
NEPA EIS, EA or DCE	Federal Lead Agency (typically FHWA)	National Environmental Policy Act (NEPA) 1969
National Historic Preservation Act Section 106 Concurrence	WA Dept. of Archeology and Historic Preservation (DAHP)	National Historic Preservation Act (1966)
Endangered Species Act (ESA) Section 7 Consultation	National Marine Fisheries Service (NMFS) or U.S. Fish and Wildlife Service (USFW)	Endangered Species Act (1973)
Section 4(f) of the Department of Transportation Act	FHWA or other USDOT	Department of Transportation Act (1966)
Noise Assessments	WSDOT	FHWA - 23 CFR 772 (2010)
NPDES Municipal Permit Compliance	WA Department of Ecology	Clean Water Act (1972) and National Pollutant Discharge Elimination System (NPDES)
SEPA EIS or Checklist	State Lead Agency (Typically WSDOT)	State Environmental Policy Act (1971)
Governor's Executive Order EO 05-05	WA Dept. of Archeology and Historic Preservation (DAHP)	Governor's Executive Order 05-05 (2005)
Critical Areas Compliance	Local Government	WA Growth Management Act

# Environmental Review and Permitting SEPA/NEPA in the Design Process



If you do this process well, you can minimize the costs of mitigation through changes to design that are identified through SEPA/NEPA review and serve to avoid/minimize impacts

# Environmental Review and Permitting

## Legal Authority: Permitting



Environmental Permits	Administered By	Legal Authority From	Federal	State	Local
<b>Section 404 Permit</b>	U.S. Army Corps of Engineers	Clean Water Act (1972) Section 404			
<b>Section 10 Permit</b>	U.S. Army Corps of Engineers	Rivers and Harbors Act (1899)			
<b>Bridge Permit</b>	U.S. Coast Guard	General Bridge Act (1946)			
<b>Section 401 Water Quality Certificate</b>	WA Department of Ecology (Ecology) or EPA on Tribal and Federal lands	Clean Water Act (1972) Section 401			
<b>Coastal Zone Management Certificate</b>	WA Department of Ecology (Ecology)	Coastal Zone Management Act (1972)			
<b>Hydraulic Permit Approval (HPA)</b>	WA Department of Fish and Wildlife (WDFW)	RCW 77.55 & WAC 220-110			
<b>Aquatic Lands Use Authorization</b>	WA Department of Natural Resources (DNR)	RCW 79.105 & WAC 332-30			
<b>Shoreline Permits and Exemptions</b>	Local Government or Ecology	WA Shoreline Management Act (1972)			

# Summary of Major Permitting Streamlining Efforts



## WHEN

## WHAT

## RESULTS

2000 ●  **Blue Ribbon Commission Report**  
Recommendation 11: Streamline permitting for transportation projects

2001 ●  **Transportation Permit Efficiency and Accountability Committee (TPEAC)** .....▶  
Established in May with passage of the Environmental Permit Streamlining Act (RCW 47.06C)

2003 ●  **Multi-Agency Permit (MAP) Team**  
To provide permit services for a set of WSDOT projects. Membership includes: WSDOT, WDFW, Ecology, US Army Corps, King County DES

2005 ●  **Overview of Environmental Permitting for Transportation Projects - Joint Legislative Audit Review Committee (JLARC)**  
Four recommendations and four topics for future study

●  **Business Process Review of Environmental Permitting for Transportation Projects - JLARC**  
Review of 10 transportation projects with 8 recommendations

2006 ●  **TPEAC Sunsets in March 2006** .....▶

- TPEAC Subcommittees
- Compliance Training and Reporting
- Programmatic Permits
- Watershed Mitigation
- Permit Delivery
- Local Government Task Force

- Compliance tracking system
- Integrated Mitigation Policy Guidance
- Multi-agency web-based permitting tools
- Mitigation Screening Tool
- Programmatic Nighttime Noise Permits
- Programmatic Permits for 10 project types
- Shoreline Management Act - Exempt Activities
- Interdisciplinary Teams to coordinate permits on 2 mega-projects
- WSDOT Development Services Manual

●  **Final Letter re: Business Process Review of Environmental Permitting for Transportation Projects - Transportation Performance Audit Board (TPAB)**  
Discussion of JLARC recommendations with emphasis and new ideas

●  **Executive Order 06-02: Regulatory Improvement - Improve, Simplify, and Assist**  
Directed at all regulatory, taxing, licensing, and permitting agencies

2008 ●  **MAP Team** .....▶  
Begins production of semi-annual performance reports

2012 ●  **2ESSB 6406**  
Ecology to update the categorical exemptions to the State Environmental Policy Act, increasing maximum threshold levels for specified project types, and to update the environmental checklist

2013 ● **Senate Majority Caucus Coalition**  
Proposal to examine costs associated with permit approval while maintaining adherence to federal standards

- Reports on:
- Permitting predicability
  - Inter-agency early project coordination
  - Inter-agency accessibility
  - Inter-agency relationships
  - Effective environmental protection and mitigation

# Environmental Review and Permitting Mitigation Overview



Mitigation Type	% of Estimated Mitigation Cost	Requirement Source	Administered Through	Technical Requirements
Stormwater Facilities	51.3%	Federal Clean Water Act (CWA)	Ecology NPDES Permit	HRM <sup>1</sup> , SMMWW <sup>2</sup> , SMMEW <sup>3</sup>
Wetland Restoration	20.9%	CWA; GMA; Fed and State No Net Loss Policy	ACOE 404 permitting & Local CAOs	Wetland Mitigation in Washington State
Noise Walls	14.6%	Federal Rule 23 CFR 772; FWHA Guidance	WSDOT	WSDOT: Noise Policy and Procedures
Stream Protection	10.3%	CWA; GMA; ESA	ACOE 404 permitting & WDFW HPA	WDFW
Context Sensitive Solutions	1.9%			
Temporary	0.7%			
Dust Control	0.3%			

<sup>1</sup> WSDOT Highway Runoff Manual

<sup>2</sup> Stormwater Management Manual for Western Washington

<sup>3</sup> Stormwater Management Manual for Eastern Washington

# Environmental Review and Permitting Mitigation Overview



- Stormwater facilities, wetland mitigation and noise abatement comprise ~ 87% of mitigation costs
- Stormwater facilities are designed based on federal requirements and Ecology standards
- Stormwater facilities are designed through site-specific conditions – costs can vary depending on approach
- Wetland mitigation type and size is negotiated with the U.S. Army Corps of Engineers and local government on a case-by-case basis – type, size, and cost can vary
- Wetland mitigation is determined through Ecology, U.S. Army Corps of Engineers Corps, and Environmental Protection Agency (EPA) guidance
- State guidance/requirement could be modified through legislative action or rule making, but would have to be consistent with federal standards

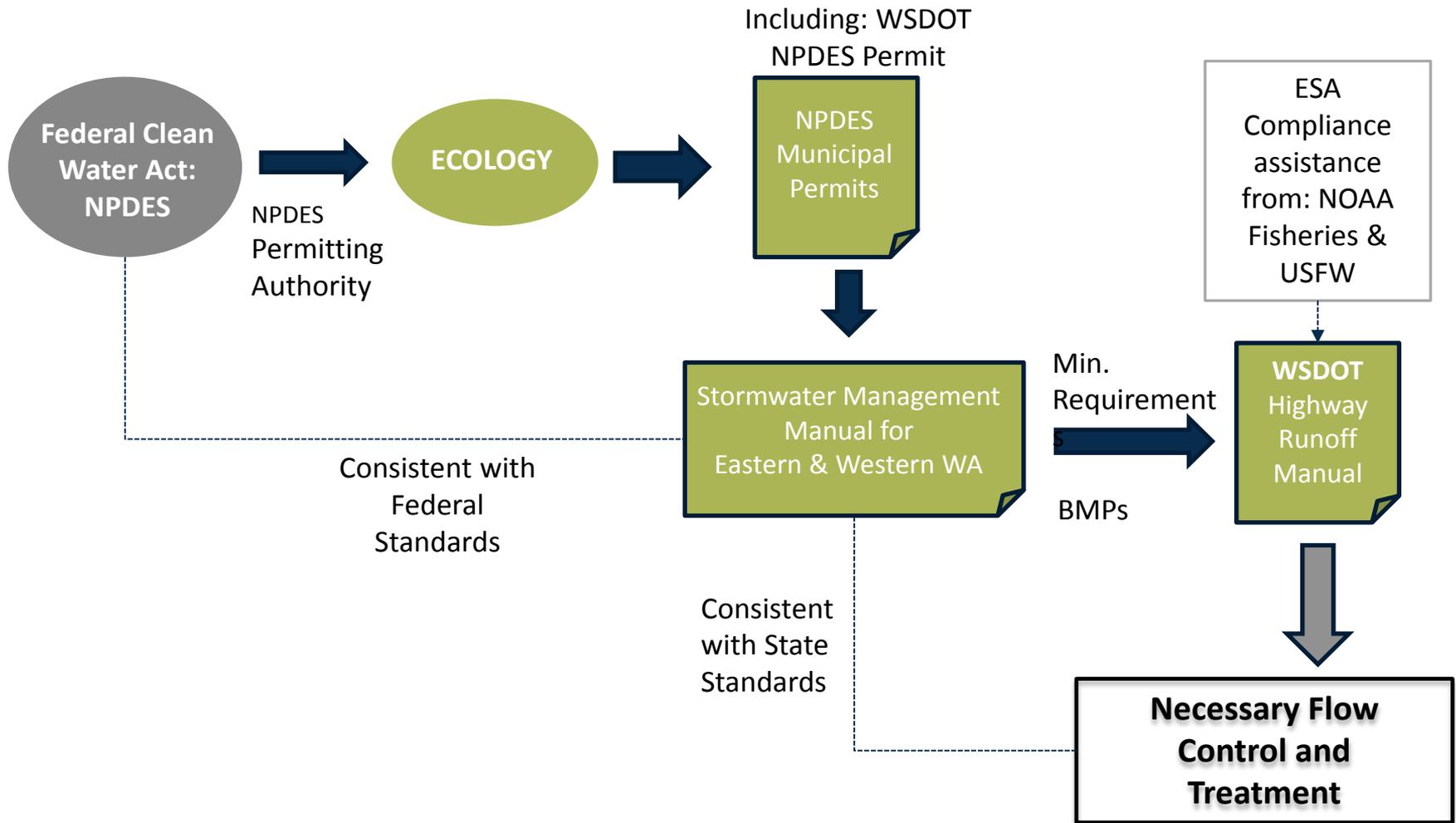
# Environmental Review and Permitting

## Stormwater



- WSDOT operates and maintains about 40,000 acres of impervious surfaces
- WSDOT must comply with federal and state water quality laws
- WSDOT achieves stormwater compliance through following the stormwater permit including the Highway Runoff Manual (HRM)
- The HRM includes minimum requirements and best management practices equal to those found in Ecology's Stormwater Management Manuals For Western and Eastern Washington (SMMWW & SMMEW)
- Stormwater costs come primarily from requirements for:
  - Flow Control
  - Treatment Facilities

# Environmental Review and Permitting Stormwater



# Environmental Review and Permitting

## Wetland Mitigation



*Governor's Executive Order 89-10: "Achieve no overall net loss in acreage and function of Washington's remaining wetlands base"*

- Mitigation Sequencing;
  - **Step 1.** Avoid - Adverse impacts to aquatic resources are to be avoided and no discharge shall be permitted if there is a practicable alternative with less adverse impact
  - **Step 2.** Minimize - If impacts cannot be avoided, appropriate and practicable steps to minimize adverse impacts must be taken
  - **Step 3.** Compensate - Appropriate and practicable compensatory mitigation is required for unavoidable adverse impacts which remain. The amount and quality of compensatory mitigation may not substitute for avoiding and minimizing impacts
- Mitigation type and cost based on size and function of impacted wetland

# Environmental Review and Permitting

## U.S. Army Corps Mitigation



- Section 404 of the Federal Clean Water Act regulates discharge of dredge or fill materials to Waters of the U.S.
- Waters of the U.S. include: Lakes, Rivers, Stream, and Wetlands
- Fill in waters of the U.S. require mitigation to achieve “No Net Loss”
- Mitigation costs are driven by type and scope of mitigation
  - Avoid, minimize or compensate
  - Preserve, Restore, Enhance, Create
  - Type and size of compensatory mitigation based on size of impact and loss of functions
- Compensatory Mitigation ratios in WA are based on Wetland Mitigation in Washington State  
- Joint guidance provided by:
  - Washington State Department of Ecology;
  - U.S. Army Corps of Engineers Seattle District; and
  - U.S. Environmental Protection Agency Region 10

# Environmental Review and Permitting

## State and Local Mitigation



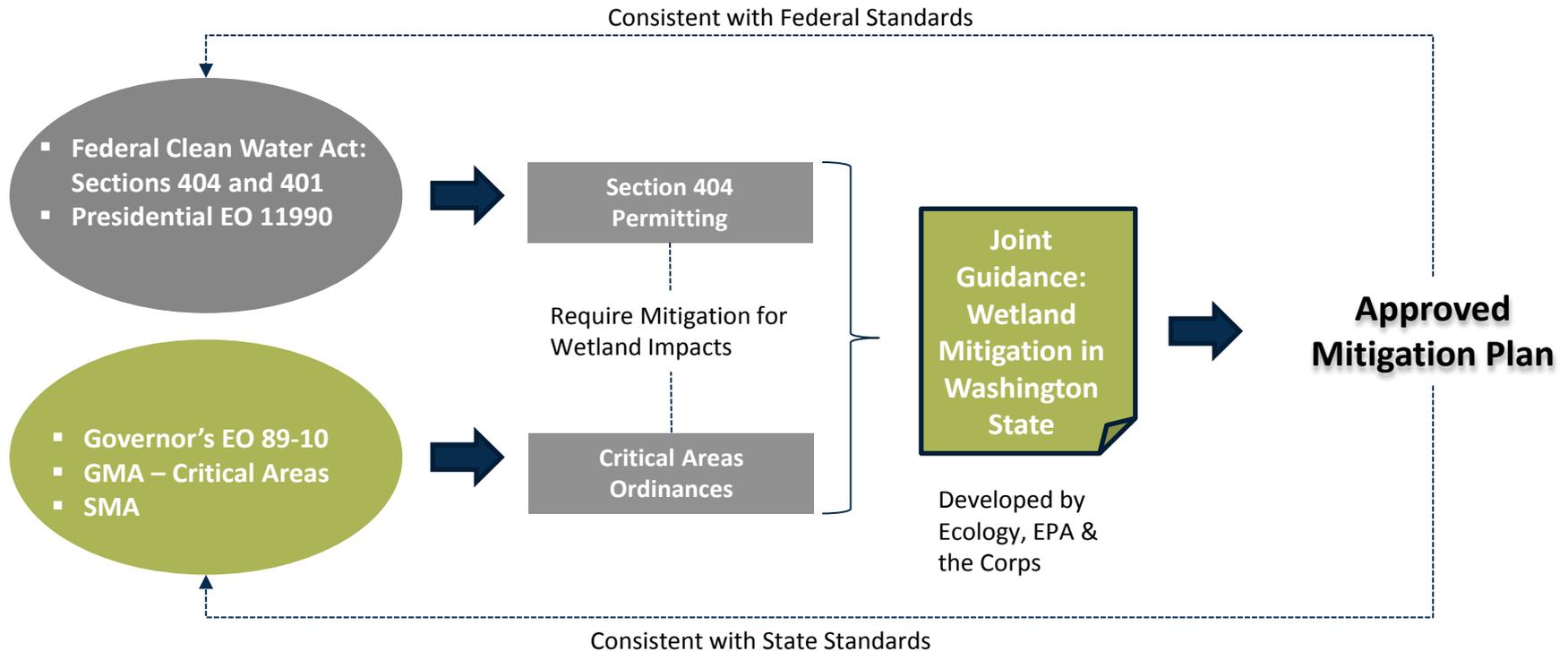
- The Growth Management Act (GMA) requires that all Cities and Counties in the state designate and protect the functions and values of critical areas using best available science
- Critical Areas include:
  - Wetlands
  - Areas with a critical recharging effect on aquifers used for potable water
  - Fish and wildlife habitat conservation areas
  - Frequently flooded areas, and
  - Geologically hazardous areas
- Critical Areas Ordinances (CAO) protect streams and wetlands through buffers
- CAO require mitigation for impacts to critical area AND buffers (NEPA only requires critical areas)
- Mitigation ratios for buffers are typically 1:1
- Mitigation ratios for wetlands consistent with *Wetland Mitigation in Washington State* (2006)

# Environmental Review and Permitting

## Wetland Mitigation



### Regulatory Authority



# Environmental Review and Permitting

## Why Mitigation Ratios?



- **Risk of Failure.** Some wetland mitigation projects do not successfully compensate for wetland function loss and degradation
- **Temporal Loss.** It may take many years for a compensation site to achieve the “ecological equivalency” to replace lost wetland function
- **Some Types of Compensation Result in a Net Loss.** Some types of compensation result in a net loss of wetland acreage and/or function (e.g., enhancement or preservation). One way to minimize this loss is to require larger amounts of compensation
- **Type of Wetlands and their Functions.** Loss of a wetland with high functions carries a higher risk of failing to replace the functions
- **The Location and Kind of Compensation.** Out-of-Kind or distant replacement have a higher likelihood of degrading overall wetland functions
- **Permanence or Degree of Impact or Alteration.** In some cases a wetland may only be temporarily disturbed. Impacts that are relatively short in duration generally require lower mitigation ratios than permanent impacts

Source: Wetland Mitigation in Washington State *Part 1: Agency Policies and Guidance* (2006)

# Environmental Review and Permitting

## Mitigation Ratios

- To determine the compensatory mitigation needed, the project applicants must answer the following questions to the satisfaction of the permitting agency:
  - What are the types and extent of wetlands (area and function) affected by the project?
  - How will the proposed mitigation compensate for the impacts (i.e., how will the project contribute to the goal of no net loss of wetland area, functions, or both)?
  - Will the proposed mitigation be successful and sustainable?

# Environmental Review and Permitting Typical Ratios for Compensatory Mitigation

Net Loss  
of Area

Low  
Function

High  
Function

Category and Type of Wetland	Re-establishment or Creation	Rehabilitation Only	Enhancement Only
Category IV	1.5:1	3:1	6:1
Category III	2:1	4:1	8:1
Category II Estuarine	Case-by-case	4:1	Case-by-case
Category II – Interdunal	2:1	4:1	Not considered an option
All other Category II	3:1	6:1	12:1
Category I – Forested	6:1	12:1	24:1
Category I - based on scope or function	4:1	8:1	16:1
Category I – Natural Heritage Site	Not considered possible	6:1	Case-by-case
Category I – Coastal Lagoon	Not considered possible	6:1	Case-by-case
Category I – Bog	Not considered possible	6:1	Case-by-case
Category I - Estuarine	Case-by-case	6:1	Case-by-case

**Adapted from:** Wetland Mitigation  
in Washington State *Part 1: Agency  
Policies and Guidance*; Table 1a.  
Mitigation ratios for western  
Washington

# Environmental Review and Permitting Noise

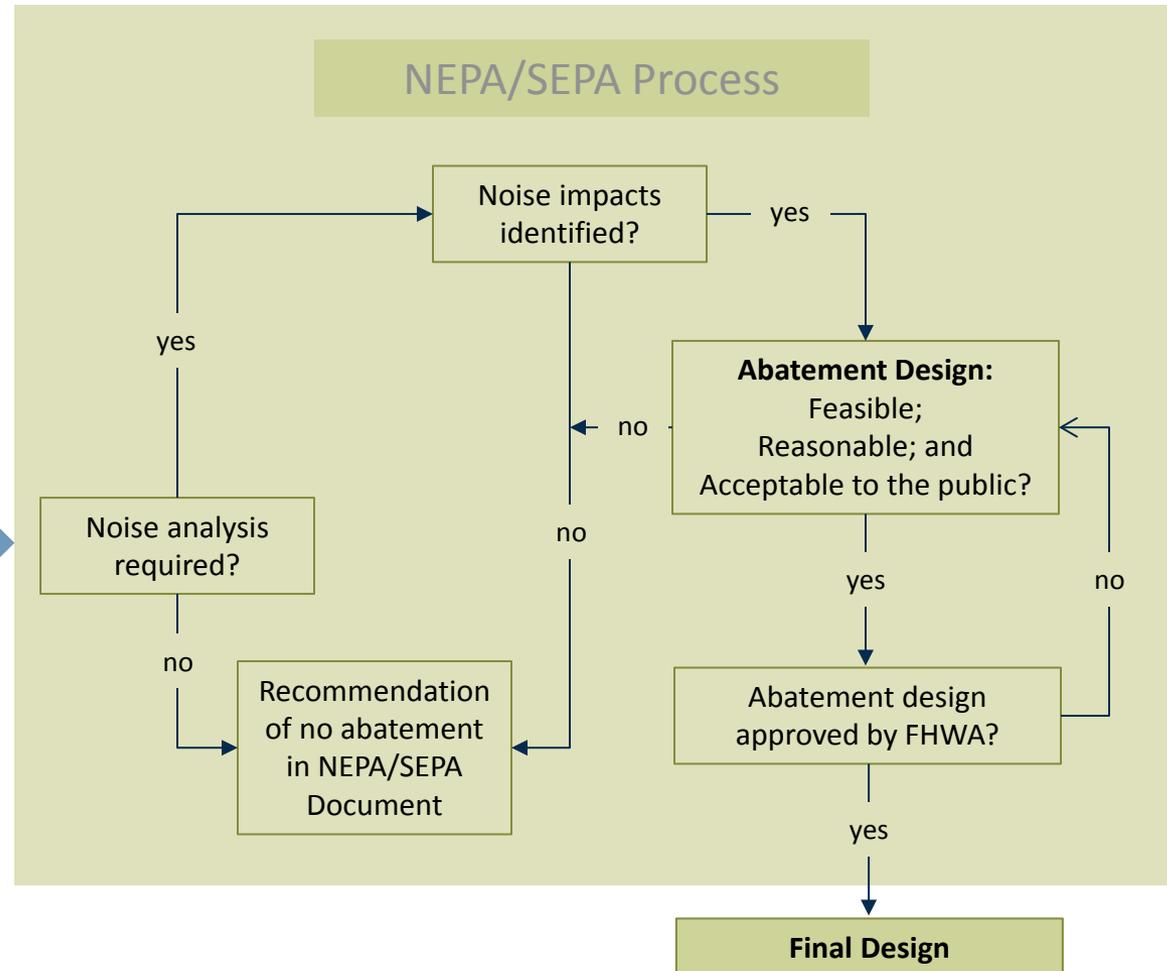
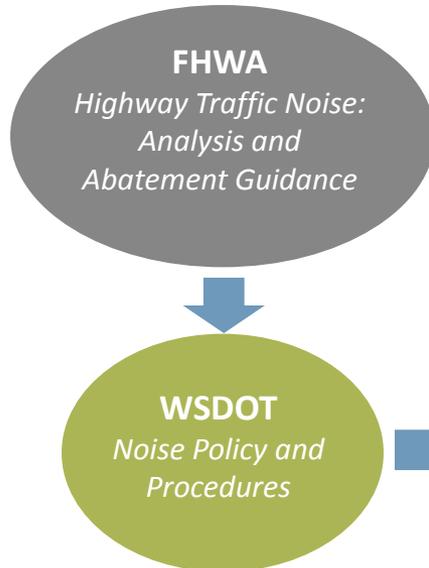


- Federal rules require that state DOTs develop noise policies that are approved by FHWA
- WSDOT's noise policy is based on the federal rule
- Noise analysis occurs within NEPA/SEPA process
- Mitigation/Abatement (noise walls) required if:
  - Feasible (sound level reductions, constructability); and
  - Reasonable (w/in allowable cost, design goal achieved)
  - Acceptable to the public (Eligible residents want abatement)
- FHWA must approve final mitigation/abatement design

# Environmental Review and Permitting Noise Abatement



Federal Rule 23 CFR 772



# Environmental Review & Permitting Legislative Alternatives



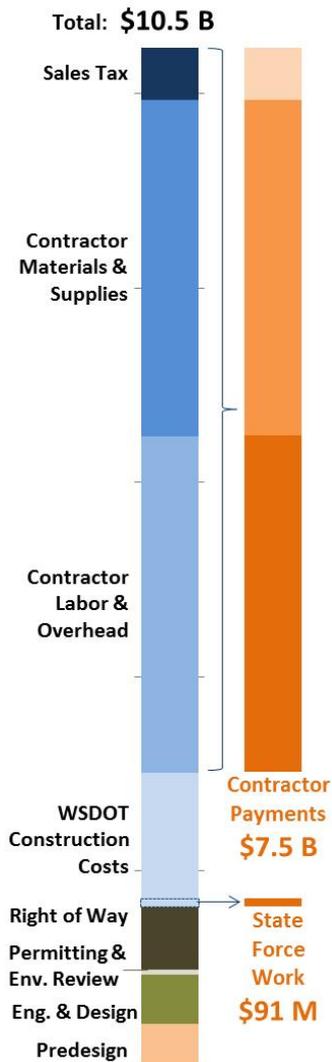
1. *Allow smaller projects that qualify for a NEPA categorical exclusion but not a SEPA categorical exemption to submit NEAP documentation only (and not the SEPA checklist)*
2. *Expand SEPA exemptions to better match the NEPA categorical exclusions*

Alternative	Policy Discussion
<p>1. Allow smaller projects that qualify for a NEPA categorical exclusion but not a SEPA categorical exemption to submit NEAP documentation only (and not the SEPA checklist).</p>	<ul style="list-style-type: none"> <li>▪ It would be less onerous for WSDOT if for projects that fall under this scenario, the NEPA documentation was sufficient to cover SEPA</li> <li>▪ This would require a change to the SEPA rules</li> </ul>
<p>2. Expand SEPA exemptions to better match the NEPA categorical exclusions.</p>	<ul style="list-style-type: none"> <li>▪ This would have the effect of reducing the number of small WSDOT projects that fall under the scenario where they qualify for a NEPA categorical exclusions but not a SEPA categorical exemption</li> </ul>

Project Delivery and Contracting

# **OVERVIEW**

# Project Delivery and Contracting Introduction



- By far the greatest share of WSDOT construction spending takes the form of contractor payments
- Given this, the effectiveness of WSDOT's approach to contracting may be the most significant area in which to explore potential cost efficiencies
- Key questions in this area include:
  - Risk allocation between owner and contractor based on who is in the best position to manage it
  - Project delivery methods that best align risk and responsibility based on project needs
  - Competitiveness of the bid process and management of construction to meet schedule and budget requirements

## Policy Considerations

- Risk allocation
- Project efficiency
- Fairness and objectivity in contract award
- Impact on WSDOT staffing

# Project Delivery Methods Overview



## Alternatives for Advisory Panel Consideration

1. Grant broad authority to WSDOT to determine project delivery methods
2. Modification to existing WSDOT authority for design-build contracting
3. Facilitate GC/CM project delivery for WSDOT projects
4. Introduce Expedited Delivery Contracting (EDC)
5. Consider opportunities to accept contractor warranties in lieu of some inspections
6. Consider giving design-build contractors additional design flexibility to support innovation and cost containment

# Project Delivery Methods Overview



*Project delivery is defined as the method for assigning responsibility to an organization or an individual for providing design and construction services (AIA and AGCA)*

## Method Selection

- The decision to use a particular project delivery method depends on:
  - Size and complexity of the project
  - Project schedule
  - Whether the delivery method is authorized
- Decision is made during the pre-design phase
- No one project delivery method is right for every project

## Project Delivery Methods

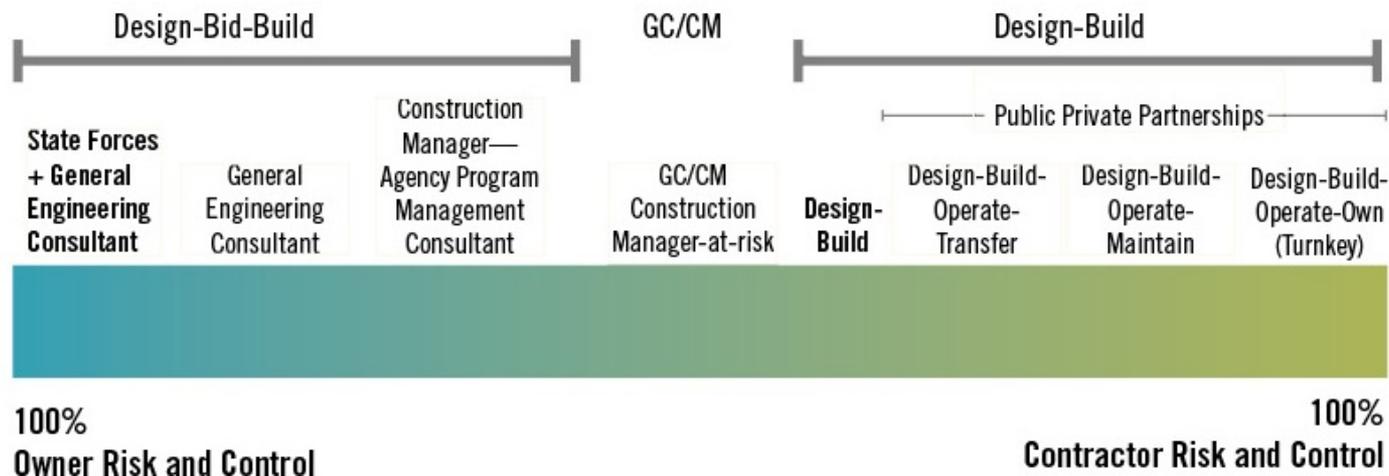
- State force labor (WSDOT labor performs construction work)
- Design-Bid-Build (DBB)
- Design-Build (DB)
- General Contractor/Construction Manager (GC/CM)

# Project Delivery Methods Risk Comparison

*Owner assumed risk varies with project delivery method*

**Key policy and program management question is how best to use contracting methods to align appetite for risk, owner core competencies, overall cost of project delivery and budget certainty.**

- **Design-Bid-Build.** Owner keeps the majority of the risk, accepts financial responsibility for project unknowns and potential errors, which may result in lower bids but also greater budget uncertainty
- **General Contractor/Construction Manager.** Owner keeps the majority of the risk and accepts financial responsibility for project unknowns, but mitigates some of that risk by introducing the contractor perspective into the design process, which may lead to lower risk, faster schedule
- **Design-Build.** Owner passes greater share of risk to contractor, contractor accepts financial responsibility for more project unknowns; risk transfer will affect bids and may increase overall project costs, but should result in greater budget certainty



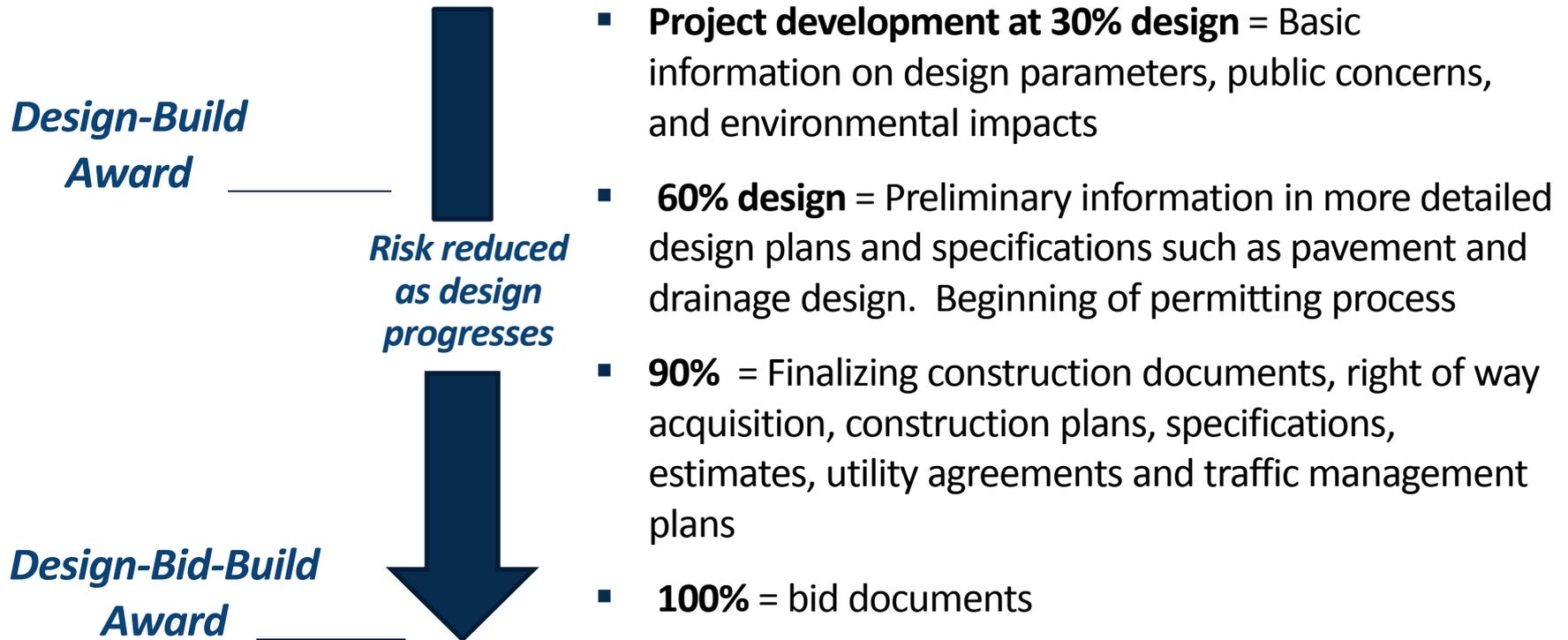
# Project Delivery Methods

## Risk, Design and Contracting



*Risk transfer opportunities do not come without cost*

Since the design is much less developed when a Design-Build contract is procured, contractors must make judgments about the uncertainties at that stage, their ability to mitigate these potential risks, and address these factors in the pricing of their bids.



# Project Delivery Methods

## Project Schedule

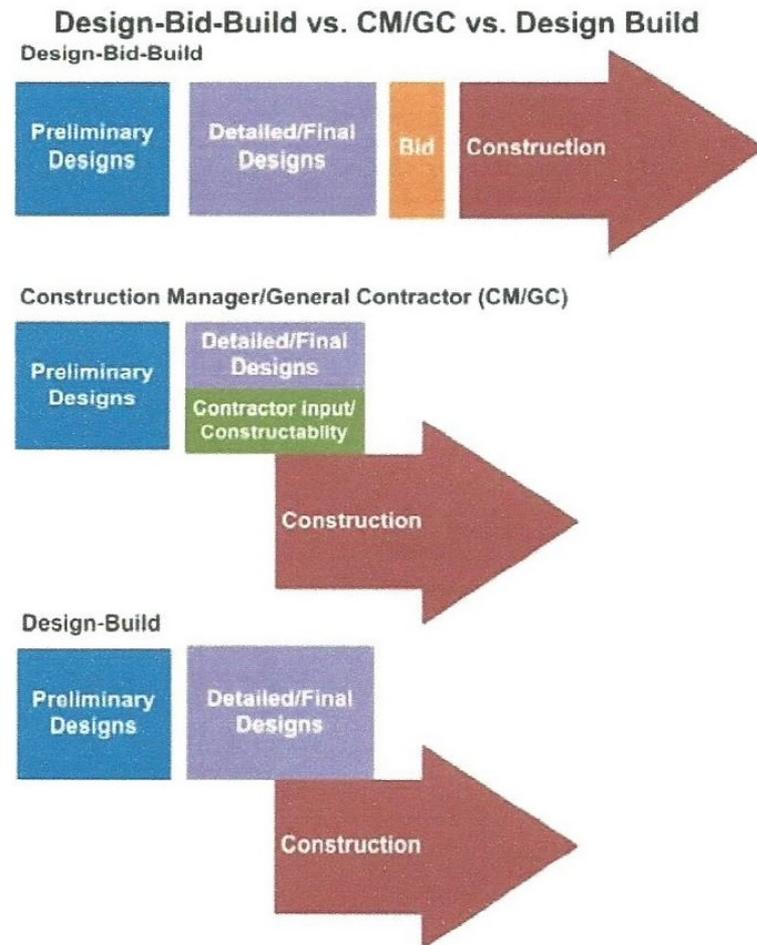
*Early involvement of contractor can reduce time...*

- DBB longest time to construction – complete design to construction documents & bid
- DB – overlap design & construction
- GC/CM – early involvement of contractor before guaranteed maximum price
  - Provides the owner with constructability, pricing, and scheduling information during the design process
  - Middle ground between DBB & DB

*“We are confident that with accelerated project delivery methods, State DOTs can deliver projects 50 percent faster. EDC is promoting accelerated project delivery methods such as Design-Build (DB) and Construction Manager/General Contractor (CM/GC), methods proven to shave years off project schedules. (FHWA Every Day Counts web site)*

*...and save money on materials*

- With Design-Build the contractor can select materials or method based on current conditions because they take the design far enough to build (and can start right away while conditions remain the same). With DBB, there can be a significant time lag before build



Project Delivery and Contracting

# **CURRENT WSDOT OPTIONS**

# Project Delivery Methods

## State Force



- “State Force Work” is construction work conducted by WSDOT maintenance and traffic staff, contracted through the highway construction program. It does not include inspections, environmental work, or mitigation work
- RCW 47.28 .030 allows state force work where the labor costs are less than \$60,000 *OR* less than \$100,000 if delaying the work would jeopardize a state highway or constitute a danger to the traveling public
  - Average expenditures per project on state force work may be higher than \$60,000 because the \$60,000 limit applies only to labor, not materials and supplies
- WSDOT used state force construction workers on approximately 42% of projects in our project database. Expenditures on state force construction work totaled \$90.7 million over the 10-year period (when adjusted to 2012 dollars)

	Number of Projects	% of Projects	Expenditures	% of Expenditures	Average Expenditure per Project
All Project Costs	2,293	100%	\$ 10,473.9 M	100.0%	\$4,567,789
State Force Construction Work	968	42%	\$ 90.7 M	0.9%	\$93,650

# Project Delivery Methods

## Design-Bid-Build



### What is it?

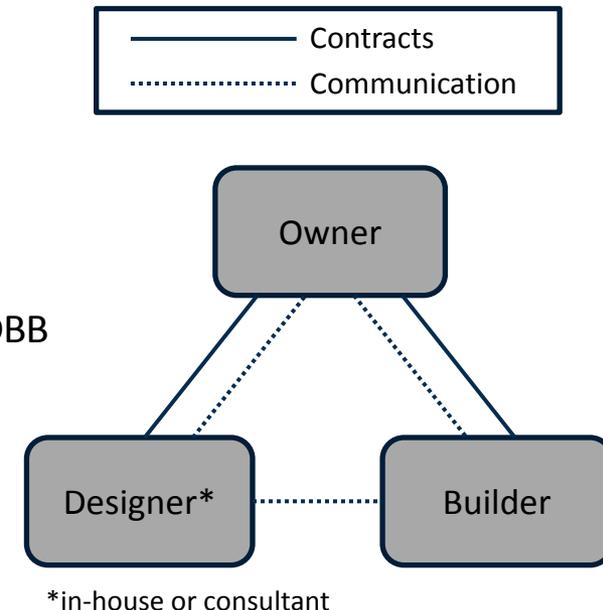
- Traditional project delivery method
- Owner design with staff or consultant services
- Advertise & award a separate construction contract based on the completed construction documents
- Owner responsible for design & warrants the quality of the construction documents to the construction contractor

### Other States

- All states use DBB

### WSDOT

- RCW 47.28 establishes DBB requirements
- Project database – 1,525 contracts with \$7.5 billion in payments
  - 1,509 or 99% of contracts in the 10-year project database were DBB
  - Dollar value \$5.7 billion or 76% of total



# Project Delivery Methods

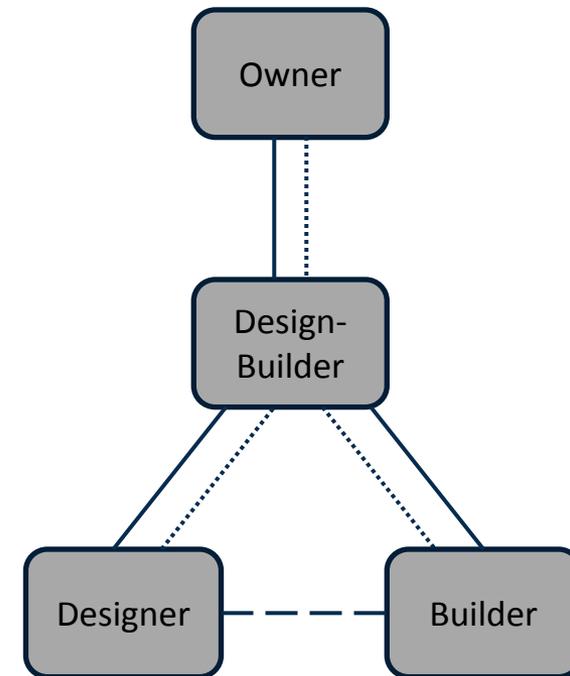
## Design-Build

### What is it?

- Award design and construction contract together
- Shifts risk to private sector
- Handoff from WSDOT to the contractor typically takes place at 20-30% design

### WSDOT

- RCWs 47.20.780 & 785 authorize for projects greater than \$10 million and for 5 projects greater than \$2 million where
  - DB is critical to construction methodology, OR
  - Opportunity for greater innovation & efficiencies between designer & builder, OR
  - Significant savings in delivery time
- Project database – 1,525 contracts with \$7.5 billion in payments
  - 16 contracts, or 1% design build projects
  - Dollar value \$1.8 billion, or 24%
- Recognized national leader among state DOTs in design-build



# Project Delivery Methods

## Design-Build



*FHWA – design-build greater potential for schedule than cost reduction*

### **2006 FHWA Design-Build Effectiveness Study**

- Found 14% reduction in project schedule, 3% reduction in project cost from DDB
- No change in project quality between DBB and DB

### **FHWA Recommended Application of Design-Build**

- Medium to large projects that are more complex in nature and would benefit from innovative concepts in project design early in the project
- New/widening, rehabilitation/reconstruction, and bridge/tunnel projects have sufficient size and complexity to enable the private sector to apply more cost-effective ways to develop the projects & take on higher project risk
- Projects with high sense of urgency or direct user-fee based financing where it is critical to initiate revenue from user fees (i.e. tolling)
- Trained & capable staff at the DOT
- Presence of competent design & construction firms to bid on the project

# Project Delivery Methods

## Design-Build



*Design-Build studies show disadvantages and advantages*

### **Advantages**

- Time savings – early involvement of contractor, overlapping design & construction, no separate contractor bidding
- Cost savings – communication efficiencies, few change orders, reduction inspection by DOT
- Quality improvement – focus on quality control and quality assurance, project innovations

### **Disadvantages**

- Reduces competition by excluding smaller firms
- Favors large national engineering and construction firms
- Increases cost by eliminating low bid requirement for contracting
- Modifies traditional checks & balances between design and construction

# Project Delivery Methods

## Design-Build



*Other states – 45 other state legislatures have authorized Design-Build*

### **Thresholds/limits of authorization**

- 27 of the 45 states have no threshold or limit on DB projects
- 18 of the 45 have set a threshold or limit for DB projects
- 6 of the 45 have a sunset provision

### **Public hearings requirements**

- NH and NC do not set a limit, but require a public hearing or legislative report if projects are greater than \$25 million (NH) or \$50 million (NC)

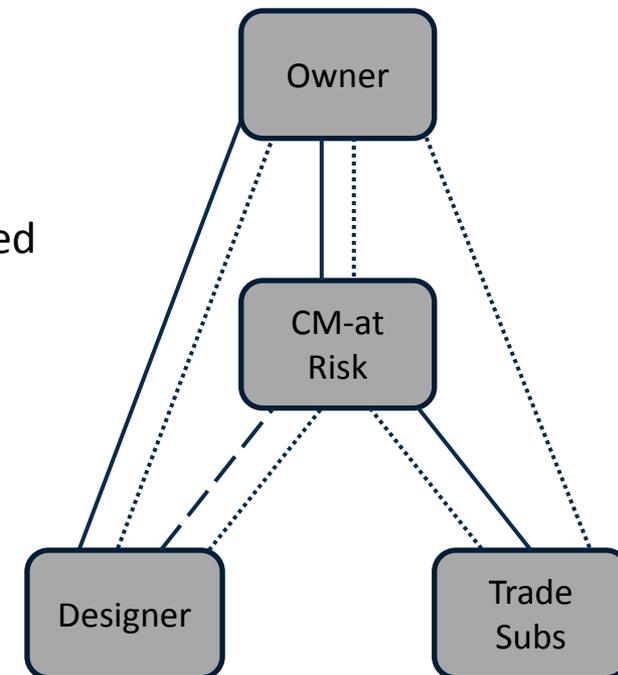
# Project Delivery Methods

## GC/CM

*General Contractor/Construction Manager (GC/CM)*  
*[also called Construction Manager at Risk and Construction Manager/General Contractor (CM/GC)]*

### What is it?

- Contract with a construction manager (CM) during design process to provide constructability input
- Involves 2 contracts with a contractor
  - Preconstruction services with a provision for a guaranteed maximum price (GMP)
  - Construction contract
- Owner is not liable for costs in excess of GMP unless scope changes
- Owner responsible for design, typically done with consultant services



# Project Delivery Methods

## GC/CM



### WSDOT

- Not separately authorized for WSDOT highway projects
- RCW 39.10 Alternative Public Works Contracting governs other agency use of GC/CM
  - State ferry system authorization for GC/CM for terminal projects sunsetted in 2007
  - WSDOT could use this process

### *FHWA SEP -14 & Every Day Counts Initiatives – Encourage GC/GM*

#### **Advantages – FHWA**

- Fosters innovation
- Reduces owner risk due to contractor feedback during design
- Flexibility to respond to uncertainty
- Improve design quality
- Improve cost control
- Optimize construction schedule

#### **Disadvantages - FHWA**

- Reduces competition
- Limiting role for smaller firms



# Project Delivery Methods

# Capital Projects Advisory Review Board

## *RCW 30.10 creates a Capital Projects Advisory Review Board*

- In Washington, it is typically used for vertical construction buildings
- Part of Department of Enterprise Services to evaluate public capital projects construction processes, including the impact of contracting methods on project outcomes, and to advise the legislature on policies related to public works delivery methods
- Board appoints a project review committee to review & approve public works projects using the Design-Build and GC/CM contracting methods and to certify or recertify public bodies to use DB or GC/CM for projects for 3 years or may approve on a project by project basis if agency not certified
- To certify a public body, the committee shall determine that the public body:
  - Has the necessary experience and qualifications to determine which projects are appropriate for using alternative contracting procedures;
  - Has the necessary experience and qualifications to carry out the alternative contracting procedure;
  - Has resolved any audit findings on previous public works projects in a manner satisfactory to the committee.

# Project Delivery Methods

# Capital Projects Advisory Review Board

## *Project criteria for GC/CM projects*

- Project implementation involves complex scheduling, phasing, or coordination
- Involvement of the GC/CM during the design stage is critical to the success of the project
- Project encompasses a complex or technical work environment
- No threshold dollar amount for projects

# Project Delivery Methods

## Method Selection



*How does WSDOT choose its preferred approach for each project?*

It appears that Design-Bid-Build is the default and Design-Build (or other method) is treated as an exception where a project manager needs to make a case for its use (see slide 28)

**From the Mega-Project Assessment:**

***Finding:***

*At WSDOT, there appears to be less structure in terms of how decisions are made regarding delivery methods. Thoughtful consideration of the risk profile of specific mega projects will lead to a delivery method tailored to the project.*

***Recommendation:***

*We recommend that the highest-level executives within WSDOT consider all possible scenarios before selecting the contracting approach, and then consider how authority should be aligned for the specific projects.*

# Project Delivery Methods

## Design-Build Method Selection

*How does WSDOT choose its preferred approach for each project?*

**When selecting Design-Build as the delivery method, WSDOT relies on their Design-Build Project Delivery Guidance Statement (2006)**

*Below is an outline of the procedures to follow when proposing Design-Build as the project delivery method for your project.*

- 1. The project engineer develops a schedule of milestones for the project.*
- 2. The project engineer completes a cost risk assessment or uses the department Cost Estimating Validation Process (CEVP).*
- 3. The project engineer completes a design-build risk matrix for the project.*
- 4. The project engineer circulates the schedule and risk matrix to the appropriate specialty groups (environmental, geotechnical, etc.) for review and comment.*
- 5. The Region's representatives from the Design-Build Policy Team present the recommendations to the Region Administrator.*
- 6. The Region Administrator reviews and makes a recommendation to the Assistant Secretary for Engineering and Regional Operations*
- 7. The Assistant Secretary for Engineering and Regional Operations reviews the recommendation and either concurs or rejects.*

# Project Delivery Methods Historical Breakdown



## WSDOT projects are overwhelmingly delivered using Design-Bid-Build

- WSDOT has authority to use Design-Build on any project over \$10 M
- WSDOT used Design-Build on 10.7% of contracts over \$10 M
- Design-build contracts over \$10 M accounted for 36.2% of estimated contract costs
- WSDOT had authority to use Design-Build on up to 5 smaller pilot projects between \$2-\$10 M. Three of these projects appear in our database; the other two are not yet complete

	Number of Contracts	Engineer's Cost Estimate	Average Contract Estimate
Design Build	15	1,556,644,311	103,776,287
Non-Design Build	1,270	4,721,724,403	3,717,893
<b>TOTAL</b>	<b>1,285</b>	<b>6,278,368,714</b>	<b>4,885,890</b>

Engineer's Estimate of Contract Size	All Contracts	Design Build Contracts	% of Estimated Contracts
Less than \$2 M	830	0	0.0%
\$2 M to \$10 M	343	3	0.9%
More than \$10 M	112	12	10.7%
<b>TOTAL</b>	<b>1,285</b>	<b>15</b>	<b>1.2%</b>

Engineer's Estimate of Contract Size	All Contract Estimates	Design Build Contract Estimates	% of Estimated Dollars
Less than \$2 M	631,187,526	0	0.0%
\$2 M to \$10 M	1,392,839,367	15,833,181	1.1%
More than \$10 M	4,254,341,821	1,540,811,130	36.2%
<b>TOTAL</b>	<b>6,278,368,714</b>	<b>1,556,644,311</b>	<b>24.8%</b>

*These tables reflect the subset of contracts for which we had reasonably complete information.*

*All costs reflect final engineer's estimates in Year of Expenditure dollars*

# Project Delivery Methods

## WSDOT Design Build Contracts

- The following table shows the 15 completed design-build contracts for which we have complete estimate, award, and payment data:

Design Build Projects*	Engineer's Estimate	Award Amount	Expenditures	Net: Estimate to Award	Net: Award to Expenditure	Net: Estimate to Expenditure
SR 16/New Tacoma Narrows Bridge	615,000,000	615,000,000	627,835,344	0	12,835,344	12,835,344
I-5/SR 526 to Marine View Drive	184,992,868	184,992,860	239,850,898	-8	54,858,038	54,858,030
I-405/112th Ave SE to SE 8th St Widening	125,000,000	124,000,000	137,685,223	-1,000,000	13,685,223	12,685,223
I-405/NE 8th St to SR 520 Braided Ramps	175,100,000	107,500,000	119,915,959	-67,600,000	12,415,959	-55,184,041
I-405/I-5 to SR 169 Stage 1	87,501,003	91,500,005	104,505,841	3,999,002	13,005,836	17,004,838
I-405/I-5 to SR 169 Stage 2	109,999,985	83,599,000	92,741,560	-26,400,985	9,142,560	-17,258,425
SR 519 Intermodal Access Project	66,969,343	66,969,343	70,186,791	0	3,217,448	3,217,448
SR 532/Corridor Improvements - Design-Build	53,746,892	50,415,851	58,299,692	-3,331,041	7,883,841	4,552,800
I-405/SR 520 to SR 522 Stage 1	40,000,000	47,500,004	53,514,770	7,500,004	6,014,766	13,514,770
Active Traffic Management, Signs, ITS and Software	37,948,029	34,450,000	41,465,283	-3,498,029	7,015,283	3,517,254
I-405/NE 195th St to SR 527 - Northbound Auxiliary Lane	30,000,010	19,263,000	21,416,421	-10,737,010	2,153,421	-8,583,589
I-5 NB/Joe Leary Slough to Nulle Road Vic - Paving	14,553,000	14,553,000	16,024,460	0	1,471,460	1,471,460
SR 16/New Tacoma Narrows Bridge	9,163,681	9,163,681	12,922,740	0	3,759,059	3,759,059
SR 9/SR 92 Intersection Improvements	3,919,498	3,346,888	3,600,719	-572,610	253,831	-318,779
US 2/Rice Road Intersection - Safety Improvements	2,750,002	2,170,507	2,367,527	-579,495	197,020	-382,476
<b>TOTAL</b>	<b>1,556,644,311</b>	<b>1,454,424,139</b>	<b>1,602,333,228</b>	<b>-102,220,172</b>	<b>147,909,089</b>	<b>45,688,916</b>
<i>Percent Difference</i>				-6.6%	10.2%	2.9%

*These tables reflect the subset of design-build contracts for which we had reasonably complete information*

*All costs reflect Year of Expenditure dollars*

# Project Delivery Methods

## Recent Findings



### *WSDOT SR 520 Pontoon Construction Project, Internal Review Report*

#### **Schedule was a driver:**

- *“The group concluded that using a Design-Build contracting method was the only way to meet the schedule.”*
- *“The schedule to deliver pontoons and to have the bridge open by 2014 drove decision-making in this project, and overshadowed effective balancing of other considerations such as risk and cost.”*

#### **Decision had risk implications:**

- *...but, in this case included the option for the Design-Builder to use a highly developed design by WSDOT for the major element of the contract (the pontoons). This decision put the responsibility for any and all design-related problems with the pontoons on WSDOT and caused confusion regarding the appropriate contract administration process. When that decision was made, there was then:*
  - Limited follow through regarding documentation of that decision and its implications*
  - Limited consideration of the risks associated with that decision, their implication and a risk management strategy to avoid or minimize those risks*

# Project Delivery Methods

## Recent Recommendations



### *WSDOT Mega Project Assessment*

#### **Recommendations:**

- Highest-level executives within WSDOT consider all possible scenarios before selecting the contract approach, and then decide how the authority should be organized for each project
- When selecting a contracting method, the Department should: perform a thorough risk analysis and quantify all project risks; consider the amount of risk that should be retained versus transferred to the contractor; on mega projects, the Chief Engineer should review and approve the delivery strategy

# Project Delivery Methods

## Issues Raised during Interviews

- WSDOT is a strong owner and good to work with
- They require DB contractor to use the WSDOT design manual – not much room for flexibility or innovation
- Inspection – WSDOT retains inspection rights for all their work, even Design-Build. This is expensive. Contractor warranties may be as effective and are less expensive and provide more ownership to the work crews
- Choice has been made to go for lowest cost, which implies that WSDOT retains a lot of the risk
- Too many mega-projects at one time has stretched staff too thin. They often add staff once a problem has been identified, instead of staffing up early in the project to help get it off to a good start

# Project Delivery Methods

## Policy Considerations



*Beyond risk assignment issues, there are other policy considerations related to selection of project delivery method*

### Project Efficiency

- RCW 47.20 780 notes - The legislature further finds that **the design-build process and other alternative project delivery concepts achieve the goals of time savings and avoidance of costly change orders**

### Ensure Fairness and Objectivity in Project Delivery Methods

- RCW 39.10.200 - The legislature finds that the traditional process of awarding public works contracts in lump sum to the lowest responsible bidder is a **fair and objective method of selecting a contractor**

### DOT Staffing

- Potential for reductions in design staffing levels particularly with Design-Build
- Need for staff expertise to administer contracts

# Project Delivery Methods Alternatives



## 1. Grant broad authority to WSDOT to determine project delivery methods

Four states provide Department of Transportation broad authority to select project delivery method

- Florida - FDOT authorized to establish program for highway projects demonstrating innovative techniques which may include but are not limited to technology, innovative bidding & financing techniques, accelerated construction procedures – limit of \$120 million in projects annually under this authorization
- Michigan – All federal-aid projects and projects over \$100,000 shall be performed by a contract awarded by competitive bidding unless the department shall affirmatively find that under the circumstances relating to those projects, some other method is in the public interest
- Oregon – ODOT authorized to exempt contracts from public bidding requirements if it is unlikely that the exemption will encourage favoritism or the exemption will result in substantial cost savings. May use the exemption as a pilot project for the agency to determine whether the use of an alternative contracting method actually results in substantial cost savings
- Rhode Island – RIDOT authorized to use any type of contract (except cost plus a percentage of cost and cost reimbursement contracts) which will promote the best interests of the state. Also have specific authorization for construction manager-at-risk services

**PRO:** Allow maximum administrative flexibility to utilize project delivery methods

**CON:** Reduces role of legislature in determining project delivery methods

# Project Delivery Methods Alternatives



## 2. Modify design-build authorization

- RCW 47.20.780 & 785 authorization is for projects greater than \$10 million and for up to 5 projects between \$2 - \$10 million where:
  - DB is critical to construction methodology, OR
  - Opportunity for greater innovation & efficiencies between designer & builder, OR
  - Significant savings in delivery time

Alternative	Discussion
a. Allow for projects greater than \$2 million that meet criteria	<ul style="list-style-type: none"> <li>▪ Parallel RCW 39.10.300 which allows design-build for state projects over \$2 million if show one of three reasons (same as in RCW 47.20.780 &amp; 785)</li> <li>▪ 35% of projects in database greater than \$2 million and 8% greater than \$10 million (2013\$)</li> </ul>
b. Allow for projects of any size that meet the criteria	<ul style="list-style-type: none"> <li>▪ 27 states have no threshold. Of these 27, 3 require legislative reporting:                             <ul style="list-style-type: none"> <li>▪ LA – approve by House &amp; Senate Transportation Committees</li> <li>▪ NH – report to Capital Budget Committee on projects over \$25 million 90 days after project completion</li> <li>▪ NC – report to Joint Legislative Oversight Committee on scope &amp; nature of the projects and reasons for DB if project budget over \$50 million</li> </ul> </li> </ul>

# Project Delivery Methods Alternatives



## 3. Facilitate GC/CM project delivery for WSDOT projects

Alternative	Discussion
<b>Separate Authorization for WSDOT Projects</b>	
a) Authorize by separate legislation a.i.) Require legislative report	<ul style="list-style-type: none"> <li>▪ Clear authority for WSDOT</li> <li>▪ Same treatment as DB authorization which is done separately for WSDOT</li> <li>▪ 2 of 17 states that have CM/GC authorization require legislative reports               <ul style="list-style-type: none"> <li>▪ CA – annual report</li> <li>▪ TN – notice to Chairs of Senate and House Transportation Committees when planning to use CM/GC</li> </ul> </li> </ul>
<b>WSDOT Subject to Capital Projects Advisory Review Board Process Currently Authorized</b>	
b) Administrative decision by WSDOT	<ul style="list-style-type: none"> <li>▪ No separate legislation required</li> <li>▪ Uniform treatment of state agencies</li> </ul>

# Project Delivery Methods Alternatives



## 4. Introduce use of Expedited Delivery Contracting

Alternative	Discussion
Expedited Delivery Contracting (EDC) - Job Order Contract	<ul style="list-style-type: none"><li>▪ A contract in which the contractor agrees to a fixed period, indefinite quantity delivery order contract which provides for the use of negotiated, definitive work orders for public works as defined in RCW <a href="#">39.04.010</a></li><li>▪ Authorized for ferries in RCW 39.10.420</li><li>▪ Process for small repetitive projects in which the design preparation process is streamlined and pre-approved contractors bid competitively on small projects</li><li>▪ Goal is to reduce the administrative work and speed up project delivery</li><li>▪ Opportunity for smaller firms to access work with less bureaucracy</li></ul>

# Project Delivery Methods Alternatives



## 5. Consider opportunities to accept contractor warranties in lieu of some inspections

Alternative	Discussion
Accept contractor warranties in lieu of some WSDOT inspections	<ul style="list-style-type: none"><li>▪ WSDOT has full time inspectors on site all day, monitoring the work.</li><li>▪ On a typical private contract, the contractor takes responsibility and uses a check list that when complete indicates that it is time for DOT to verify</li><li>▪ This system has hold points (rebar is complete) and witness points (rebar would be verified (witnessed) and concrete pouring could begin)</li><li>▪ Idaho allow warranties on chip sealing and striping</li><li>▪ Retaining control can cost money. Waiting for agency inspections adds cost</li></ul>

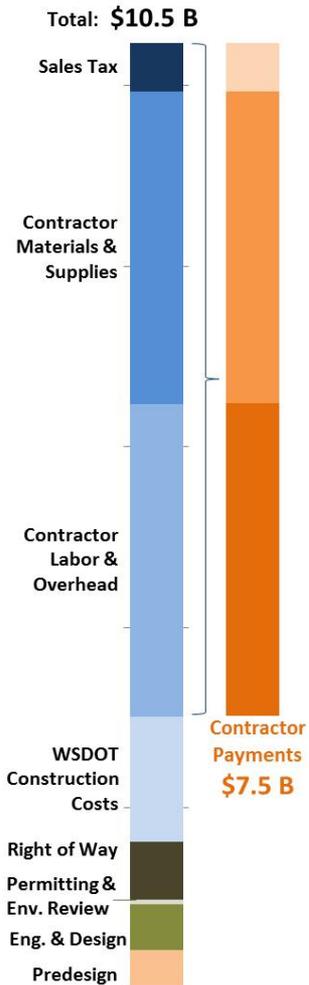
## 6. Consider giving design-build contractors additional design flexibility to support innovation and cost containment

Give Design-Build contractors additional design flexibility to support innovation and cost containment	<ul style="list-style-type: none"><li>▪ Other states provide more flexibility and will allow use of other designs with approval</li><li>▪ Greater flexibility to adapt to current conditions – material prices and other considerations</li></ul>
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Cost Analysis

# **CONSTRUCTION CONTRACTING: BIDDING, AWARD & PAYMENT**

# Construction Contracting Introduction



- For the majority of its projects, WSDOT hires a contractor to deliver the completed project
- Firms are hired through a bidding process:
  - WSDOT engineers create a project estimate for budgeting purposes and to secure money from appropriate sources. This estimate is not shared with bidders
  - Firms bid on the project and WSDOT uses a scoring system to award the project to the highest scoring bidder. Price plays a significant role in scoring
  - Throughout the project, change orders may be authorized on a project that increase or reduce the final project total
- The purpose of this section is to describe and quantify the estimate, bidding, award, and payment processes

# Construction Contracting Projects vs. Contracts



- Total contractor payments presented previously are based on analysis of actual payments on individual projects
- The following analysis focuses only on prime construction contracts
- There are fewer contracts than projects because contracts and projects do not align in a one-to-one relationship:
  - WSDOT may use multiple construction contracts for one project
  - WSDOT may complete multiple projects under a single contract
- WSDOT's project database contains 2,293 projects completed through use of 1,525 prime contracts

# Construction Contracting Projects vs. Contracts



- In terms of data about contracts, the project-based database presented previously only included actual contract expenditures
- To understand the relationship between engineer's estimates, awards, and final payments, WSDOT provided a separate contract database that tracks the lifecycle of each contract
- The new contracts database matches with a subset of the projects database where most projects completed under the contract were finished between 2003 and 2012. Therefore, some contracts with projects completed prior to 2003 or after 2012 have to be excluded
- The following analysis is based on the remaining 1,285 contracts that encompass \$6.6 billion of expenditures (in Year of Expenditure dollars)
- Dollars in the following analysis are not adjusted for inflation, to allow for comparison between estimates, awards, and payments

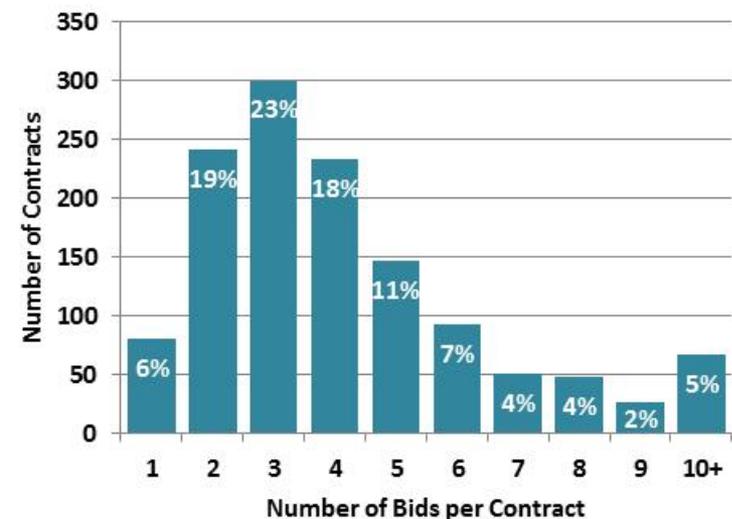
	All Prime Contracts (2012 \$)	Prime Contracts w/Award Data (YOE \$)
Count	1,525	1,285
Expenditures	\$ 7,460.4 M	\$ 6,608.9 M

# Construction Contracting Bidding



- Competitiveness.** Competition for construction contracts ensures WSDOT has multiple qualified bids to choose from and encourages contractors to submit competitive bids
- On average, WSDOT received 4.3 bids per contract over the past 10 years. The highest number of bids occurred on contracts in the \$5 M to \$100 M range

Contract Size	Number of Awards	Number of Bids	Average
Less than \$1 M	619	2,589	4.2
\$1M to \$5 M	480	1,981	4.1
\$5M to \$10M	84	385	4.6
\$10M to \$25M	60	362	6.0
\$25M to \$100M	36	186	5.2
\$100M +	6	17	2.8
<b>TOTAL</b>	<b>1,285</b>	<b>5,520</b>	<b>4.3</b>

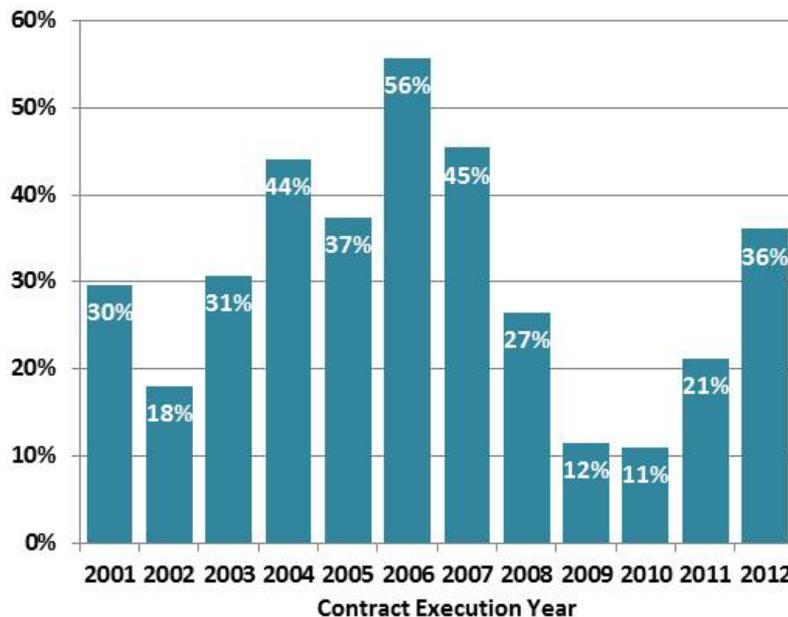


- The NW Region averaged 4.9 bids per contract; all other regions were between 3.8 and 4.2 bids per contract

# Construction Contracting Engineer's Estimates and Awards

- Before going to bid, WSDOT's engineering department creates a construction cost estimate for budgeting purposes
- One of challenges is to ensure that the budget is based on reasonable expectations of costs in the face of market conditions which can vary widely

Percent of contracts with award higher than engineer's estimate



- Estimates are based on historical costs and prepared a couple years before award and build in assumptions about inflation to award
- Highly competitive bid environments can lead to greater share of bids over estimate and increase estimates for future bids

# Construction Contracting Project Savings



- When WSDOT is able to deliver a project under budget, the difference is considered project savings that are then available for redistribution through the appropriations process
- Looking at the contracts over the past 10 years:
  - Bid awards have come in \$540 million under engineer's estimates
  - Payments to contractors have exceeded bid awards by \$870 million
  - Net contractor payments have exceeded engineer's estimate by \$330 million

Contract Size	Number of Awards	Total Estimate	Total Award	Total Expenditure	Net: Estimate to Award	Net: Award to Expenditure	Net: Estimate to Expenditure*
Less than \$1 M	619	319,895,166	281,794,285	303,910,334	-38,100,881	22,116,049	-15,984,832
\$1M to \$5 M	480	1,197,349,806	1,080,213,820	1,166,572,179	-117,135,986	86,358,358	-30,777,628
\$5M to \$10M	84	624,139,955	574,440,578	632,727,258	-49,699,377	58,286,680	8,587,303
\$10M to \$25M	60	1,074,018,798	936,199,103	1,042,204,415	-137,819,695	106,005,312	-31,814,383
\$25M to \$100M	36	1,631,291,937	1,510,707,216	1,785,451,119	-120,584,721	274,743,903	154,159,182
\$100M +	6	1,431,673,052	1,355,417,590	1,678,055,890	-76,255,462	322,638,300	246,382,837
<b>TOTAL</b>	<b>1,285</b>	<b>6,278,368,714</b>	<b>5,738,772,592</b>	<b>6,608,921,193</b>	<b>-539,596,123</b>	<b>870,148,602</b>	<b>330,552,479</b>
<i>Percent Difference</i>					-8.6%	15.2%	5.3%

\* The Hood Canal Bridge East Half (graving dock) project accounts for \$235 million of this total.

# Construction Contracting Awards and Payments

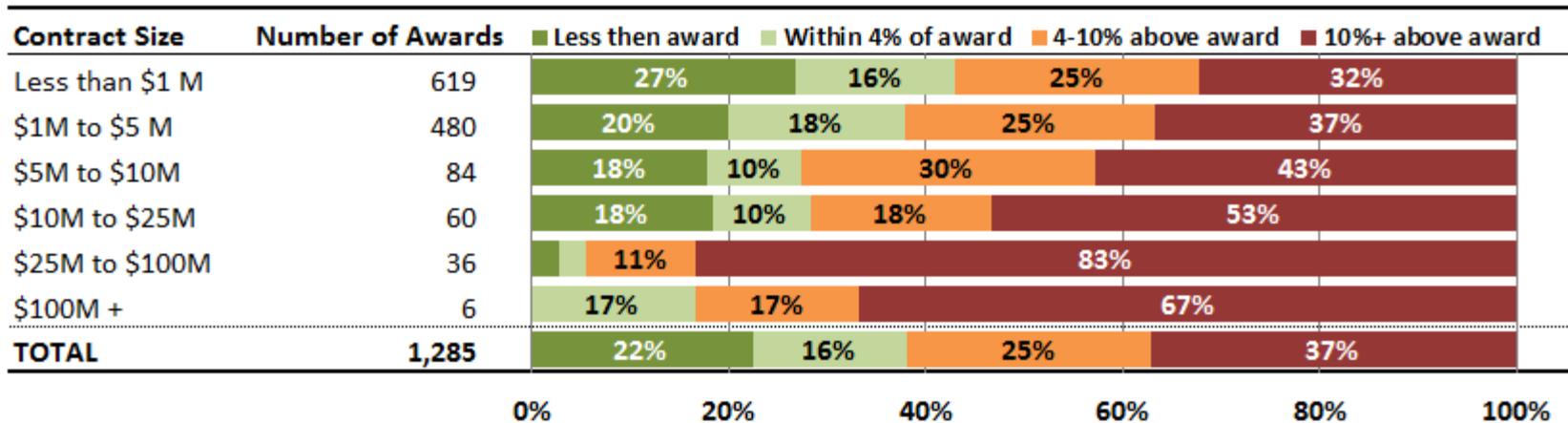


- Comparing total payments on a contract to the original award amount helps measure how estimated project costs change during the construction period
- Costs may change after a contract is awarded for many reasons:
  - Market changes in the price of materials
  - Unforeseen circumstances requiring changes to the quantity of work or materials
  - Delays or other schedule adjustments
  - Errors or omissions in original project plans
  - Management decisions to add value to a project
  - Requests from third parties

# Construction Contracting Awards and Payments



- Over the 10-year study period, approximately 62% of contracts had final payments more than 4.0% above the original award
  - About 16% of contracts had payments within 0% to 4% of the original award amount, which align with WSDOT’s contingency policies
  - About 22% of contracts resulted in payments lower than the awarded amount.
  - Larger contracts were more likely to end up with payments over the original award amount



# Construction Contracting Awards and Payments



- Within the sample set of projects, WSDOT paid approximately \$870 million (15%) more than the original award amount over 10 years
- The largest variances between payments and awards were in contracts over \$25 million, which accounted for about \$597 million of payments above award amounts
- Larger projects had payments higher than award amounts more frequently and by a larger percentage than smaller projects

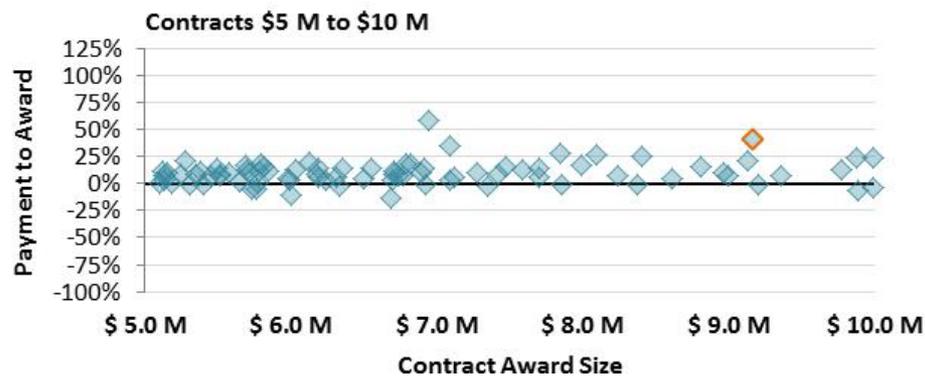
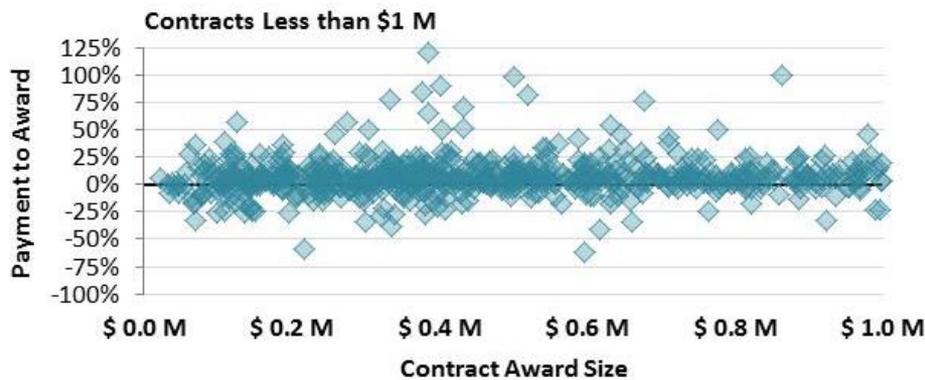
Contract Size	Number of Awards	Amount Awarded	Amount Paid	Difference*	% Difference
Less than \$1 M	619	281,794,285	303,910,334	22,116,049	8%
\$1M to \$5 M	480	1,080,213,820	1,166,572,179	86,358,358	8%
\$5M to \$10M	84	574,440,578	632,727,258	58,286,680	10%
\$10M to \$25M	60	936,199,103	1,042,204,415	106,005,312	11%
\$25M to \$100M	36	1,510,707,216	1,785,451,119	274,743,903	18%
\$100M +	6	1,355,417,590	1,678,055,890	322,638,300	24%
<b>TOTAL</b>	<b>1,285</b>	<b>5,738,772,592</b>	<b>6,608,921,193</b>	<b>870,148,602</b>	<b>15%</b>

\* The Hood Canal Bridge East Half graving dock accounts for \$223 million of this total.

# Construction Contracting Awards and Payments



- The following charts show the distribution of relationships between original award amounts and final payment totals by contract award size



*Contracts highlighted in orange are design-build contracts*

# Construction Contracting Awards and Payments



- The following charts show the distribution of relationships between original award amounts and final payment totals for different contract sizes



- Differences between award and payment amounts on these large contracts drive a significant portion of the variance overall between payments and awards
- The Hood Canal Bridge East Half (graving dock) constitutes nearly 1/3 of total variance between the award and payment amounts in our study dataset

# Construction Contracting Awards and Payments



- WSDOT primarily uses the design, bid, build contracting method for projects. For projects built under this method, WSDOT paid a total of 17% more than the original award amount

- Excluding the Hood Canal Bridge contract, Design-Bid-Build contract payments were 12% over awards

Contract Size	Design, Bid, Build Contracts			
	Contracts	Awards	Payments	Percent Over
Less than \$1 M	619	281,794,285	303,910,334	8%
\$1M to \$5 M	478	1,074,696,425	1,160,603,933	8%
\$5M to \$10M	83	565,276,897	619,804,518	10%
\$10M to \$25M	58	902,383,103	1,004,763,534	11%
\$25M to \$100M	30	1,136,273,013	1,364,737,182	20%
\$100M +	2	323,924,730	552,768,465	71%
<b>TOTAL</b>	<b>1,270</b>	<b>4,284,348,453</b>	<b>5,006,587,966</b>	<b>17%</b>

- For projects using the design-build method, WSDOT spent about 10% more than the original award amount

Contract Size	Design-Build Contracts			
	Contracts	Awards	Payments	Percent Over
Less than \$1 M	-	-	-	-
\$1M to \$5 M	2	5,517,395	5,968,246	8%
\$5M to \$10M	1	9,163,681	12,922,740	41%
\$10M to \$25M	2	33,816,000	37,440,882	11%
\$25M to \$100M	6	374,434,203	420,713,936	12%
\$100M +	4	1,031,492,860	1,125,287,424	9%
<b>TOTAL</b>	<b>15</b>	<b>1,454,424,139</b>	<b>1,602,333,228</b>	<b>10%</b>

# Construction Contracting Change Orders



- **Change Orders.** When a change becomes necessary on a project, WSDOT will authorize a change order with the contractor to either add, delete, or modify work and costs in the original contract. Through change orders, final project payments can be higher (or lower) than the original award amount
- Change orders occur for many reasons, as noted previously, and do not necessarily represent an error in project design or management
- WSDOT uses the following risk management techniques to manage project expenditures compared to award amounts:
  - **Standard Contingency.** On most projects, WSDOT assumes a standard 4% contingency factor for project managers to use for small changes necessary during construction
  - **Large Project Risk Analysis.** WSDOT conducts a more comprehensive risk analysis on projects over \$10 million to ensure the agency has adequate funds to handle unforeseen changes

# Construction Contracting Change Orders



- Change orders are tracked in WSDOT's contracts database. Dates, amounts, and authorization reason codes are recorded
  - The change order database was developed in 2007. Therefore, this analysis contains a subset of 173 contracts with \$3.1 billion in contract payments and \$246 million in change orders (*year of expenditure dollars*)
- This analysis is preliminary; the consultant team is working with WSDOT to understand the implications of different change order reason codes
- Since more than one reason can be assigned to a single change order, it is not possible to tease out exactly how many dollars were changed for each reason. Our current analysis finds the following breakdown of change order amounts assigned amongst the change order reason codes:
  - About 23% (\$57.8 M) of change order dollars are coded as the reason Unanticipated Conditions, which addresses *"situations different than assumed during design."*
  - About 18% (\$44.5 M) are coded as Engineer's Judgment, which is defined as *"A change that is a good idea... makes the project work better."*
  - About 8% (\$19.0 M) are coded as Administrative, which is defined as *"administrative functions that do not relate to the actual work, such as prevailing wage and sales tax"*
  - About 7% (\$18.4 M) are coded as Plan Error-Information, which is defined as *"plans contain a mistake that resulted from the designer working with insufficient information"*
  - About 6% (\$14.9 M) are coded as Plan Error-Mistake, which is defined as *"plans contain a mistake that, given the information available to the designer, should not have been made"*
- About 43% of change order dollars (\$105 M) have no specified reason

WSDOT Cost Efficiencies Study

**SCHEDULE AND PLAN FOR STUDY  
COMPLETION**

# JTC Study Next Steps



- Continue analysis of costs and cost drivers
- Identify policy options
- Potential conference call before December 12 meeting
- November 15: Staff Work Group Meeting
- December 6: DRAFT report to Advisory Panel
- December 12: Advisory Panel Meeting #4 – review draft report
- January 2: FINAL report to JTC staff
- January 8: Potential presentation to JTC