Joint Transportation Committee

Efficiencies in the Construction and Operation of State Transportation Projects

Advisory Panel Meeting #4|December 12, 2013

BERK STRATEGY ANALYSIS COMMUNICATIONS consulting scanlan LUND CONSULTING

Overall
Study Objective

Answer the following key questions

- Do transportation projects cost more in Washington State than in other states?
  - If yes, why?
- What can be done to increase efficiency and reduce cost?
  - WSDOT action
  - Legislative action

Organization of this presentation

- Key Findings from Cost Analysis
  - Analysis of historical expenditures
  - Evaluation of project delivery and execution
  - Cost comparison with other states
- Key Findings and Potential Actions for Key Drivers
- Next Steps

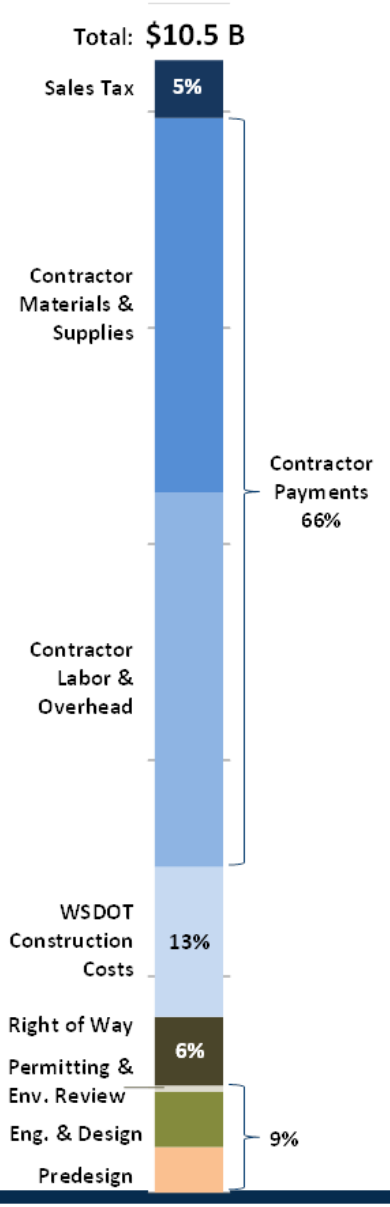
Cost Analysis

HISTORIC EXPENDITURES

WSDOT Project Expenditures (2003-12)

What do we know?

- Construction-related costs accounted for approximately 85% of total WSDOT expenditures
  - The majority of construction expenditures went toward contractor payments (66% of total costs), of which labor is approximately half
  - WSDOT construction management and related construction costs account for 13% of total costs
  - Sales tax accounts for 5% of total costs
- Non-construction costs account for 15% of the total
  - Approximately 6% of costs were for acquisition of right-of-way
  - Planning, predesign, design, permitting, and environmental review account for approximately 9% of costs
- Mitigation costs cannot be easily split out and are included within the 85% of costs that are construction
  - Analysis suggests that in projects where mitigation is required, it accounts for an average of 16% of project costs
  - Stormwater, wetlands, and noise mitigation account for 87% of mitigation costs , or about 14% of costs on projects that require mitigation



Overall Findings
Large projects drive costs

- At a programmatic level, opportunities for cost efficiencies should focus on how WSDOT manages the planning, design, and delivery of large projects
- Of the projects completed between 2003-2012:
  - 88% of the WSDOT projects in the database account for 20% of the expenditures
  - 3% of the projects account for 59% of the expenditures
- Within the 10-year sample set, WSDOT paid approximately $484 million (8%) more than the original award amount
  - The largest variances between payments and awards were for contracts over $25 million, which accounted for about $369 million of payments above award amounts
  - Larger projects had payments higher than award amounts more frequently and by a larger percentage than smaller projects
- Cost overruns on mega-projects also drive public perception around WSDOT's ability to deliver projects on time and on budget

Overall Findings
Mitigation Adds to Project Costs

- Mitigation costs can be a significant overall contributor to highway project costs and were identified as an area of interest by the legislature
- On projects where mitigation costs are contained within the overall project, WSDOT does not track costs in a way that allows us to easily identify and summarize these mitigation-related costs
- To better understand the role of mitigation on project costs, WSDOT conducted four in-depth mitigation case studies in 2003, 2006, 2009, and 2013
- Over the four studies, 46 projects totaling almost $2 billion in project costs were evaluated. Within the selected sample, 16% of project expenditures went to mitigation elements, with a significant range among individual projects of between 2% and 45%
    - The higher end of the range was generally represented by smaller projects where the mitigation component was a significant share of the total project cost

Overall Findings

Mitigation Driven by Regulatory Needs

Stormwater facilities, wetland mitigation and noise abatement comprise ~ 87% of mitigation costs for the case study projects. These project elements are determined by a combination of federal and state statutory, regulatory and policy requirements.

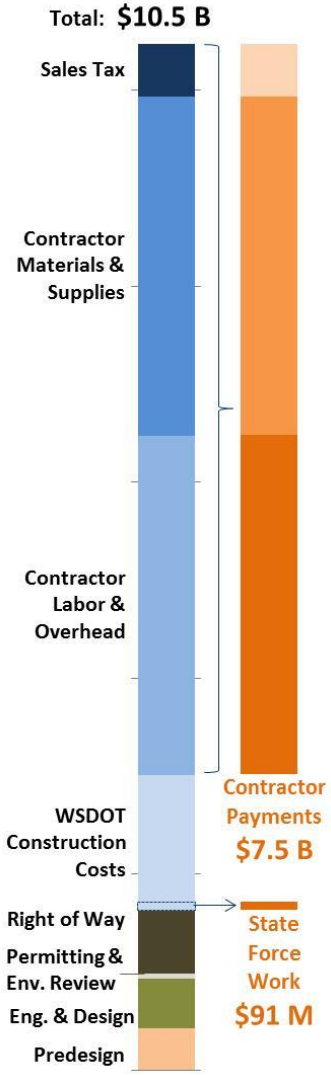
Mitigation Type	% of Estimated Mitigation Cost	Required By	Administered Through	Technical Requirements
Stormwater Facilities	51.3%	Federal Clean Water Act (CWA)	Ecology NPDES Permit	*HRM[1], SMMWW[2], SMMEW[3]*
Wetland Restoration	20.9%	CWA; GMA; Fed and State No Net Loss Policy	ACOE 404 permitting & 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%			

[1] WSDOT Highway Runoff Manual
[2] Stormwater Management Manual for Western Washington
[3] Stormwater Management Manual for Eastern Washington

Cost Analysis

HOW WELL DOES WSDOT EXECUTE AND DELIVER ON ITS PROJECTS?

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 our analysis of historical data were:
  - Where has WSDOT spent the most on contracting?
  - Where has WSDOT spent more than expected on contracting?
  - Is WSDOT's contracting experience different from the experience in other states?
  - Do contracting methods impact WSDOT's project delivery?

Project Delivery
Project Management

- Data on construction contract awards and payments helps illustrate how well WSDOT brings projects from design to completion.
- Within the sample set of projects, WSDOT paid approximately $484 million (8%) 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 nearly $369 million of payments above award amounts.
- Larger projects had payments higher than award amounts more frequently and by a larger percentage than smaller projects. *(Note: $189.5 M of this difference is from Hood Canal bridge)*

Washington Department of Transportation (WSDOT) 10-Year Cost Summary

Contract Size	Number of Awards	Amount Awarded	Amount Paid	Difference*	% Difference
Less than $1 M	656	$289,408,293	$294,784,864	$5,376,572	2%
$1M to $5 M	487	$1,097,890,445	$1,119,652,051	$21,761,605	2%
$5M to $10M	80	$552,633,373	$578,422,918	$25,789,544	5%
$10M to $25M	67	$1,046,645,633	$1,108,441,013	$61,795,379	6%
$25M to $100M	33	$1,418,262,752	$1,550,438,468	$132,175,715	9%
$100M +	6	$1,355,417,590	$1,592,318,640	$236,901,050	17%
TOTAL	**1,329**	**$5,760,258,087**	**$6,244,057,954**	**$483,799,867**	**8%**

Project Delivery
Comparison to Other States

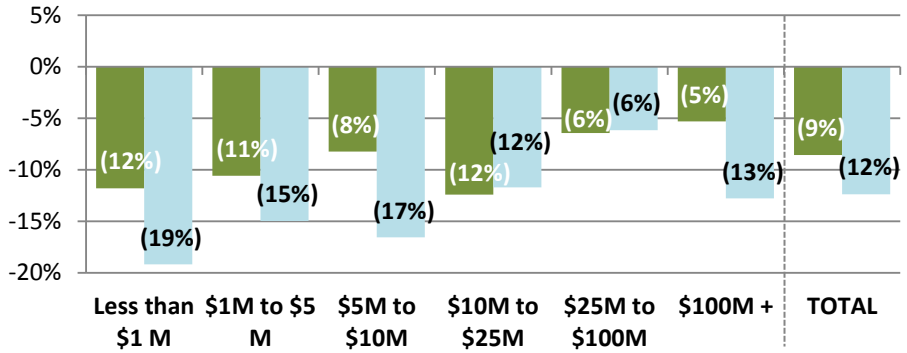
- Oregon and Utah DOTs both provided 10 years of contract history for us to compare. Utah provided estimate, award, and payment information. Oregon did not provide information on estimates.
  - Utah provided data on 969 contracts totaling $3.87 B in awards
  - Oregon provided data on 1,243 contracts totaling $3.96 B in awards
  - WSDOT contract data includes 1,329 projects totaling $5.76 B in awards
- The following table summarizes key metrics across the three states

Metric	Washington	Oregon	Utah
Difference from Estimate to Award Amount	(9%)	-	(12%)
Difference from Award to Payment Amount	8%	7%	12%
Difference from Estimate to Payment Amount	(1%)	-	(2%)

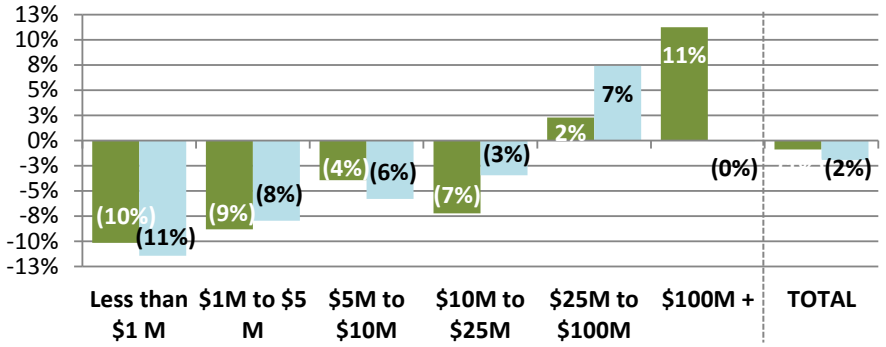
- Overall, WSDOT's project delivery metrics related to estimates, awards, and payments do not differ significantly from information provided by the Utah and Oregon DOTs.
- In all states, final expenditures came in between 7% and 12% higher than awards. All three states exhibited a pattern where larger projects were more likely than smaller projects to have final payments higher than award amounts.
- Utah and Washington exhibit a similar pattern of award amounts coming in lower than estimates (by 12% and 9%, respectively). For both states, final payments came in slightly below the final engineer's estimates as well.

Project Delivery
Comparison to Other States

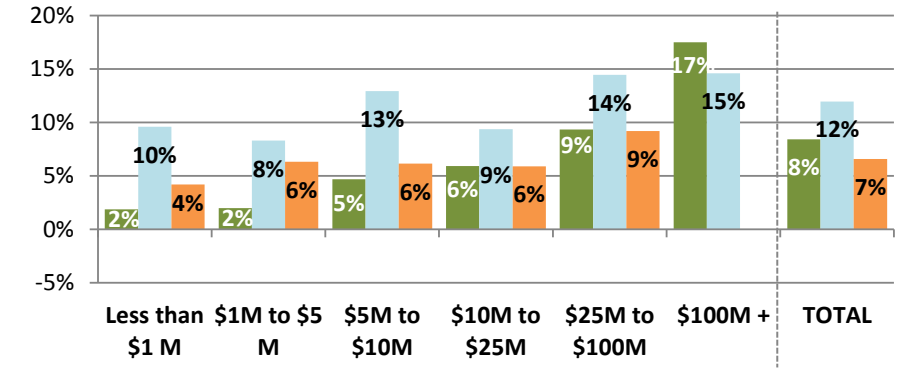
Percent Change from Final Estimate to Initial Award



Percent Change from Final Estimate to Final Payment



Percent Change from Initial Award to Final Payment



Note: Oregon data did not include any projects greater than $100 M

- In WA and UT, awards regularly came in below final estimates.
- In WA and UT, final payments regularly came in below final estimates for smaller projects, and near or above final estimates for larger projects.
- In all three states, final payments came in above award amounts. WA and OR showed a pattern of larger projects being more likely to spend above the award amount.

Project Delivery
Comparison to Other States

- All three states experienced a pattern of **large projects** coming in higher than award amounts **more frequently** and **by a higher percentage** than smaller projects.
- In Washington, projects over $25 M accounted for $369 M out of $484 M (76%) of expenditures above award amounts over 10 years.
- In Oregon, projects less than $25 M came in an average of 5.9% over award. Projects over $25 M landed about 9.2% over.
- In Utah, the differences between awards and final payments did not hold as strong a pattern as the other states. However, the difference between final engineer's estimates and final payments exhibited the same pattern.
  - Payments were less than estimates by 6.4% on projects below $25 M.
  - Payments were higher than estimates by 3.8% on projects over $25 M.

Cost Analysis
Project Delivery

Project Delivery: Impact of Contracting Method

- Washington and Utah both provided data on the type of contracting method used for each project. While Oregon did not provide this information, our understanding is that they primarily use design-bid-build contracting, with some use of design-build.
- Washington and Utah both use Design-Bid-Build and Design-Build contracting, while Utah additionally uses GC/CM contracting.
- The following pages explore the differences between estimate, award, and payment relationships across different contracting methods.

Cost Comparisons
Project Delivery

Project Delivery: Impact of Contracting Method

- The following table summarizes the pattern between estimates, awards, and payments by method.

Contracting Method	Estimate to Award		Award to Payment		Estimate to Payment	
	WSDOT	UDOT	WSDOT	UDOT	WSDOT	UDOT
Design-Bid-Build	(9%)	(14%)	10%	11%	(1%)	(5%)
Design-Build	(7%)	(17%)	5%	14%	(2%)	(5%)
GC/CM	-	3%	-	13%	-	16%
All Contract Types	**(9%)**	**(12%)**	**8%**	**12%**	**(1%)**	**(2%)**

- Both design-build and design-bid-build contract awards tend to come in below estimates. However, Utah's GC/CM contract awards come in an average of 3% above the engineer's estimate.
- The previous analysis shows that project delivery metrics don't tend to vary meaningfully by contracting type.
  - For example, in Washington, if the expenditures on the Hood Canal Graving Dock are removed, design-bid-build and design-build metrics look nearly identical.
  - If you remove projects completed through GC/CM, Utah shows a pattern very similar to Washington when comparing the two contract types the states share.

Cost Comparisons
Project Delivery

Project Delivery: Impact of Contracting Method (continued)

- GC/CM stands out as having a different pattern between estimates, awards, and payments than the other contracting types.
  - GC/CM is different in many ways from the other two methods. Contractors are selected through a competitive bidding process that assesses qualifications. Once a contractor is selected, UDOT and the contractor negotiate a final award amount.
  - Since the contractor is brought on so early in the process, estimates are made earlier in the design stage than with design-bid-build.
- The data from Utah covers the period when GC/CM was new to the Department.
  - From 2005-2008, the first four years GC/CM was used, contract payments came in nearly 20% over award amounts. Over the past four years (2009-2012), payments came in 8% higher than awards.
  - Although patterns in GC/CM changed slightly over the decade, the relationships between cost points are still different than the patterns exhibited by design-build and design-bid-build.

Cost Comparisons
Project Delivery

Project Delivery: Key Findings about Contracting Method

- Based on the analysis of the three states, likely benefits of using alternative contracting methods lie outside of simply expecting project payments to come in closer to award amounts. There is not one type of contracting that appears to regularly save more money.
- A DOT does not need to commit to a single method. Having alternative methods available to them allows the manager to choose the right method for each job.
- When determining which contracting method to use, an agency should focus on how the method may impact a particular project.
  - Design-build contracts come in with a similar payment to award pattern as design-bid-build, even though they are on average larger and more complex.
  - On big projects, where errors can be extremely costly, design-build may help mitigate risk. Large errors may have to be paid for by contractors instead of by WSDOT.
  - Involving contractors in project design through design-build or GC/CM can make for better project design and improved constructability.
  - On more complex projects, both GC/CM and design-build can result in efficiencies since construction teams are familiar with and have a say in complicated design decisions.

Cost Analysis

HOW DO WSDOT COSTS COMPARE?

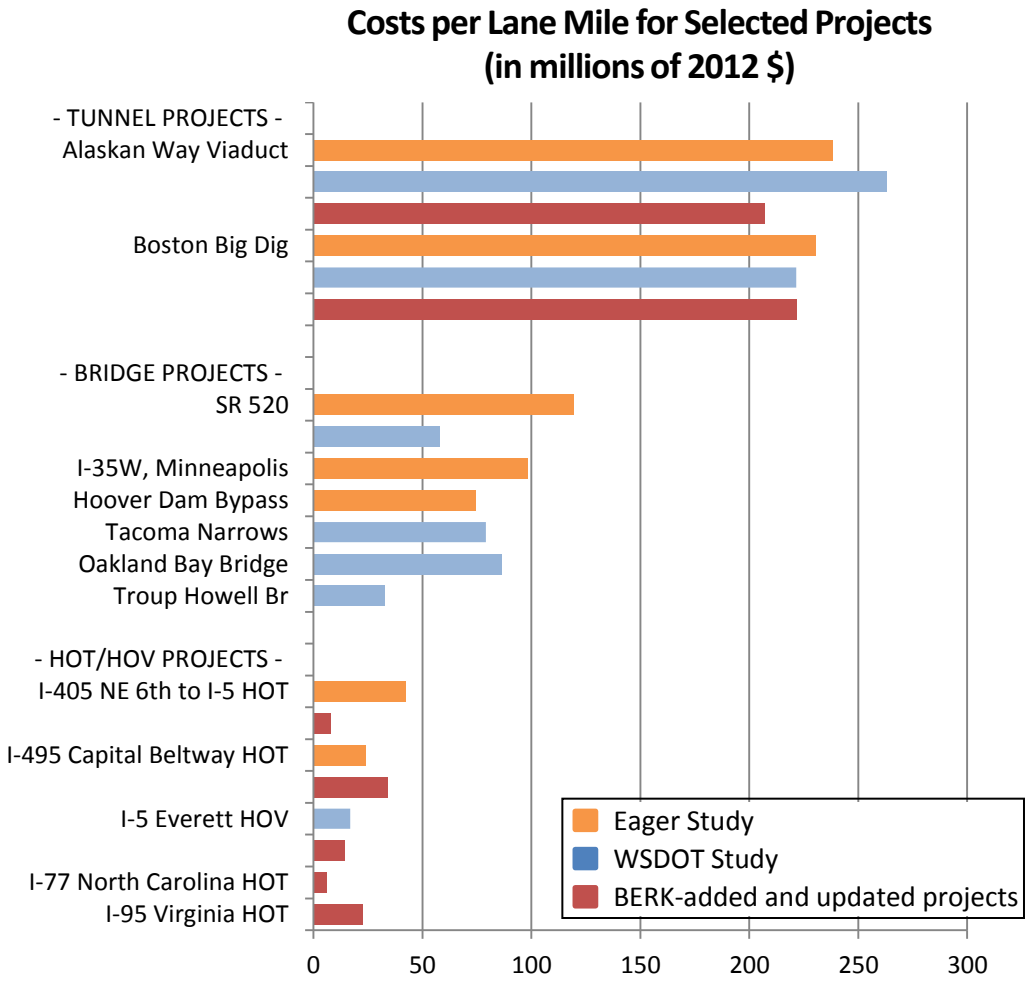
Overall Findings
Cost Comparisons

- BERK reviewed two existing studies and conducted additional research on 7 projects to try to understand how project costs compare across states.
- The two studies had opposing high-level conclusions about how WSDOT's project costs compare to other states:
  - WSDOT Study: WSDOT is in the same range as other projects on a cost per-lane-mile basis.
  - Eager Study: WSDOT's costs are significantly higher than project costs in other states per-lane-mile.
- A review of the data behind the studies shows that the seemingly different conclusions are supported by similar project data
- Looking only at comparisons of specific projects, the results of the studies are in greater agreement that the overall conclusions would suggest.
- Both studies affirm that it's very hard to make determinative statements using these types of project to project comparisons.
- Comparing projects directly is challenging with many limitations: lack of exactly comparable projects, differences in bid competition over time, or basic differences between states.

Cost Comparisons
Lit Review: Project-level Comparison

Study and Research Comparisons

- The chart shows the results of (1) updating all Eager and WSDOT study analysis to 2012 dollars and (2) researching 7 projects to find updated lane mile and budget information
- After adjusting to 2012 dollars, the Boston Big Dig cost about 7% more per lane mile than the updated budget for the Alaskan Way Viaduct, which has changed since the completion of the Eager and WSDOT studies.
- The costs for selected HOV/HOT projects varies widely. The main reason for this variation is the proportion of new to converted lanes. All five HOT/HOV projects are a mix of both.
- The I-405 NE 6th to I-5 HOT cost per lane mile is significantly lower than the Eager Study estimated. Our researched cost is based on information currently available on the WSDOT website.



Cost Comparisons

Lit Review: Project-level Comparison

Comparison Notes

Tunnel Projects

- The definition for the Big Dig includes two new bridges, an extension of an existing surface highway, and rebuilding surface street and open space through downtown Boston.
- The estimates for the Viaduct included in the WSDOT study were made prior to choosing the single-bore design. Updated analysis includes the effort to build the tunnel, as well as replacing Alaskan Way with a surface street, demolishing the existing viaduct, building an overpass at the Port of Seattle, and linking the tunnel to existing streets north and south of downtown.

Bridge Projects

- The studies include a mix of floating, suspension, and truss bridges. Each of these bridge types has a different cost profile. Bridge type drives a lot of the variance in per-mile bridge cost.
- The WSDOT and Eager studies present very different costs for the 520 bridge. While some of this is likely due to the different estimates available at the different times the analyses were completed, much of it is likely dependent on the portion of the project analyzed. The Eager study focused on the most expensive part of the project – the floating bridge from I-5 in Seattle to Medina. The WSDOT Study included the full project, from I-5 to Bellevue.

HOV/HOT Lane Projects

- The updated estimate for I-405 NE 6th to I-5 HOT is significantly lower than the Eager Study estimate. Our researched cost is based on information currently available on the WSDOT website. Since the Eager Study did not provide project details, we cannot confirm which data were used to support the cost per lane mile in that study ($41 million/lane mile).
- Variation in these projects likely stems from the number of interchanges that align with other major freeways, the number of new lanes that need to be built, and the amount and price of right of way purchases.

Cost Driver Assessment

WHAT DRIVES SIGNIFICANT VARIATIONS IN COST?

WSDOT Projects
Key Cost Drivers

- There are significant cost factors that drive program costs and which could add costs to WSDOT projects relative to similar projects elsewhere, including:
  - **Project Size**. Both required and optional decisions around project design impact *how much* WSDOT builds on an individual project
  - **State-specific Regulations.** WSDOT must comply with federal and state-specific regulations which can add costs to a project
  - **Labor Costs.** Labor comprises a significant portion of construction costs and accounts for the vast majority of other costs (engineering, design, construction management, etc.)
    - Cost of labor varies widely by state. WSDOT's labor costs are primarily driven by overall wage levels in the Pacific Northwest
    - Quantity of labor (time and/or efficiency in delivery of services) can vary based on practices, differential design and regulatory requirements
  - **Cost of Materials.** Materials account for large share of construction costs, so variations in materials costs can have a substantial impact on costs
  - **Risk Assignment.** WSDOT's extensive use of Design-Bid-Build contracting places a significant share of project risk on the owner (WSDOT) in the event of cost over-runs

WSDOT Projects
Key Cost Drivers

- The table below summarizes, by category noted on the previous page, which drivers are covered in the following analysis.

Driver Category	Drivers Included in Analysis
Project Size	Design Standards Design Choices
State-specific Regulations	Sales Tax Prevailing Wage Environmental Review and Mitigation
Labor Costs	Labor Costs by State Prevailing Wage Impacts
Cost of Materials	Construction Cost Index
Risk Assignment	Contracting Methods

Cost Driver Assessment

SCALE OF PROJECT

Project Design
Introduction

- Project design decisions affect project costs by governing *what* is built and *how much* is built for a specific project.
  - State and national Design Standards provide guidance on design decisions related to safety and mobility, such as design speed, vertical and horizontal design, lane width, and load bearing capacity.
  - DOTs additionally make many other design choices that impact scoping that fall under the discretion of the department, such as project objective, alignment, or aesthetics.
- The American Association of State Highway and Transportation Officials (AASHTO) creates design standards that serve as national guidelines.
- WSDOT has created its own Design Manual that builds off of AASHTO's standards and incorporates state-specific regulations. According to FHWA, at least 30 states have their own Design Manual.

Project Design
Design Standards

- Design standards provide guidance on elements such as:
  - Design speed
  - Lane, shoulder, and bridge width
  - Horizontal and vertical alignment and grade
  - Sight distances
  - Structural capacities
- WSDOT and the consultant team compared WSDOT's Design Manual to AASHTO's standards.
- Overall WSDOT and AASHTO standards are very similar. There are no specific variations that would likely result in significant differences in construction costs.

Project Design
WSDOT Design Standards

- Over the past three years, WSDOT has done a complete review of its Design Manual and changed a few standards to be more aligned with AASHTO's guidance. Examples include:
  - Allowing more flexibility for vertical alignment of roads
  - Allowing more flexibility for the angle at which highways and streets meet
  - Allowing more flexibility for how well lanes align across intersections in low speed situations
- WSDOT is reviewing its overall approach to improve efficiencies and increase flexibility in its design decisions by creating more sets of design standards for more project types.
- In addition to project design standards, WSDOT must follow guidance around wetlands, stormwater drainage and treatment, noise walls, and many other details. WSDOT develops these standards by collaborating with subject matter experts and stakeholders, and, like the Design Manual, reviews and udpates them periodically.

Project Design
Project Scoping

- Beyond project design guidance on safety, WSDOT makes many scoping decisions during the design process that are unique to each project, such as:
  - Scale of the project – number of lanes, number of miles, traffic estimates
  - Project alignment – location of road, intersecting with other roads
  - Project type – type of bridge, tunnel or surface street, tolling, materials
  - Project aesthetics – designs and landscaping, visual appeal
- These questions, and many others not listed, greatly impact a project's overall cost and eventual effectiveness as a transportation facility.
- WSDOT strives for a culture of continuous improvement, and is always working to understand how it can design project better.

Project Design
Concept of Practical Design

- Practical Design is an emerging approach to transportation system design. The purpose is to build transportation projects that meet a state's needs at reasonable cost
  - Focus on building *good* projects that together achieve the goal of building a *great* transportation system
  - Building projects to only those standards needed to meet stated goals
- The framework for Practical Design includes identifying:
  - **A goal you wish to achieve** – focusing on overall program goals can help prioritize decisions
  - **Project-specific purpose and need statement** - focused on unambiguous and specific performance targets
  - **Value/filters through which projects must pass** – individual factors that each state decides are important to their program

Project Design
Practical Design Experience

- According to a 2013 Transportation Research Board report, six DOTs have adopted Practical Design Policies, including Utah and Oregon.
- Given how recently Washington and other states have adopted Practical Design, the benefits of the approach are not likely to be in evidence in the historical data available.
- The TRB report did highlight several case studies that illustrate the potential cost savings of the approach.
- Missouri adopted a formal Practical Design policy in 2005 and claims to have saved approximately $400 million on projects included in its 2005-2009 STIP. Savings were invested in additional transportation projects.
    - **Example: MoDOT'sI-64/I-70 Interchange project.** Originally designed as a $69 M, 3-level structure, the design team was able to reduce its complexity by lowering design speeds and shoulder widths, building two levels instead of three, and providing simpler access to local roads. Total savings: $37 million (54%).

Project Design
Practical Design at WSDOT

- A recent effort for WSDOT's project design and delivery teams is to incorporate elements of Practical Design. WSDOT has taken an holistic approach to incorporating Practical Design, working it into both project delivery and design.
- Below are examples of how WSDOT is implementing Practical Design:

Changing Frameworks for Design and Delivery

- Identifying how and where to apply flexibility in design standards
- Focusing on project and program goals and outcomes from design through construction

Combining Similar Projects.

- Combining similar projects across the state into groups to streamline methods and create economies of scale

Designing Incremental Improvements with Long-term Benefit

- Identifying how goals can be achieved through spending less money in the short-term. Example: installing rumble strips instead of widening shoulders
- Ensure money spent today can be leveraged in the future for greater benefit toward a specific goal

Practical Design
Potential Actions

1. **Adopt Practical Design methods to guide project scoping and design decisions**
   - Incorporate Practical Design into project prioritization and selection process
   - On projects greater than $10 million include a Practical Design review to determine the cost effectiveness of the preliminary design and identify alternatives considered

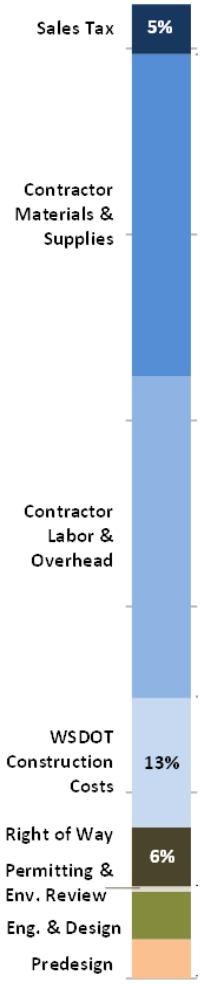
Potential Impact: HIGH
Lead Actor: WSDOT

Cost Driver Assessment

STATE SPECIFIC REGULATORY REQUIREMENTS

Sales & Use Tax Application

Based on ownership of the highway – higher tax for projects on state-owned highways



Tax	State-owned Highways	City, County, Political Subdivision, & Federal-owned Highways
Sales & use tax	▪ Applied to full contract price ▪ Materials that become part of the structure not taxed ▪ Materials used by contractor during construction (i.e. not part of the structure) taxed at purchase	▪ Not applied to full contract price ▪ All materials taxed at purchase
B&O tax	▪ Retailing classification ▪ For both prime contractors & subcontractors – 0.00471	▪ Public road classification ▪ For both prime contractors & subcontractors – 0.00484
State tax cost* for $1 million contract	Sales tax - $71,100 Prime B&O tax - $4,710 **Total - $75,810**	Sales tax - $39,000 Prime B&O tax - $4,840 **Total - $43,840**

*Cost assumptions based on conversations and research
State sales tax rate of 6.5%

Labor & services – 50%
Consumed materials – 10%
Installed materials – 40%

Sales & Use Tax
Policy Considerations

General Fund

- State sales tax rate – 6.5%
- Revenues from the state sales & use tax collected from construction contracts on state-owned highways support the State General Fund
- Revenues from the application of state sales & use tax on materials purchased and consumed during construction support the State General Fund

Federal contractor tax

- States cannot directly tax the federal government
- The Public Road Construction Exemption allows the State to tax materials at the point of purchase by contractors working on projects on federally-owned highways
- Supreme Court ruling 1983 – upheld Washington State's ability to tax materials purchased by federal contractors
  - Current law does not impose a higher, discriminatory tax on federal contractors
- Estimated revenue from federal contractors - $89 million per fiscal year

There are two alternatives for deferred sales & use tax on Tacoma Narrows Bridge and tax paid to date on SR520

- No change – repay tax as now mandated
  - SR520 toll payers would benefit from any reduced sales & use tax
- Extend reduction in some manner to Tacoma Narrows Bridge and SR520
  - Options require further consultation with the Department of Revenue

Sales & Use Tax
Potential Actions

1. Reinstate Public Road Construction exemption on state-owned highways

- Exempt from tax on total contract amount
- Contractor would pay tax on all materials at point of purchase
- Lowers tax paid with no risk with respect to federal projects

Potential Impact: HIGH
Lead Actor: Legislature – Amendment to RCW 82.04.050(10)

2. Direct receipts from state sales & use tax collected from contractors on state-owned highways to transportation fund.

- Legislature could direct receipts to the Motor Vehicle or Multi-Modal Account
- Tax paid is the same, but is returned to transportation

Potential Impact: HIGH
Lead Actor : Legislature

Alternatives 1 and 2 could be done together.

Prevailing Wage Overview

Purpose of state prevailing wage law

- " To protect workers from substandard earnings and to preserve local wage standards" (L&I Prevailing Wage Handbook)

Construction cost driver – federal and state prevailing wage requirements on:

- State funded WSDOT projects (no federal aid) – state prevailing wage requirements
- Federal-aid WSDOT projects
  - Federal prevailing wage requirements
  - State requires contractors to pay the state rate if higher

Cost of Prevailing Wage Requirements

- 1998 JLARC Highways Audit – 0.44% on state highway program – result of requirement to pay higher state rate on federal-aid projects
- No specific studies on impact of prevailing wage vs. no prevailing wage for WSDOT projects
- Other studies vary on impact of prevailing wage requirements on construction costs

- It is difficult to make comparisons between the state and federal prevailing wages

Prevailing Wage
Key Findings

- Research studies are split on whether or not prevailing wage laws make projects more expensive.
- There are aspects of the State program that add administrative burden and costs.
- State and federal prevailing wages are difficult to compare due to differences in methodology, but the higher of the two must be paid in Washington State.
- In the last 10 years, federal aid projects accounted for **82%** of contracts awarded and would have paid the federal prevailing wage, even if there was no state prevailing wage.

Prevailing Wage
Potential Actions

1. Exempt WSDOT projects from the state prevailing wage act (retain the federal prevailing wage on federal-aid projects)

Potential Impact: LOW - potential wage savings; reduction in administrative burden related to determining the higher of the two wages; could lead WSDOT to program federal funds differently and use on fewer projects
Lead Actor : Legislature

2. Exempt WSDOT federal-aid projects from the state prevailing wage act. Use federal wage rates on federal-aid projects; This would not affect Davis-Bacon & Related Acts requirements

Potential Impact: LOW - potential wage savings; reduction in administrative burden related to determining the higher of the two wages
Lead Actor : Legislature

3. Change Washington State Prevailing Wage language to match the Federal Prevailing Wage language "*payment of prevailing wages to mechanics and laborers employed directly on the site of work*"

Potential Impact: LOW - potential wage savings due to narrowing the range of activities covered by prevailing wage
Lead Actor : Legislature

Prevailing Wage
Potential Actions

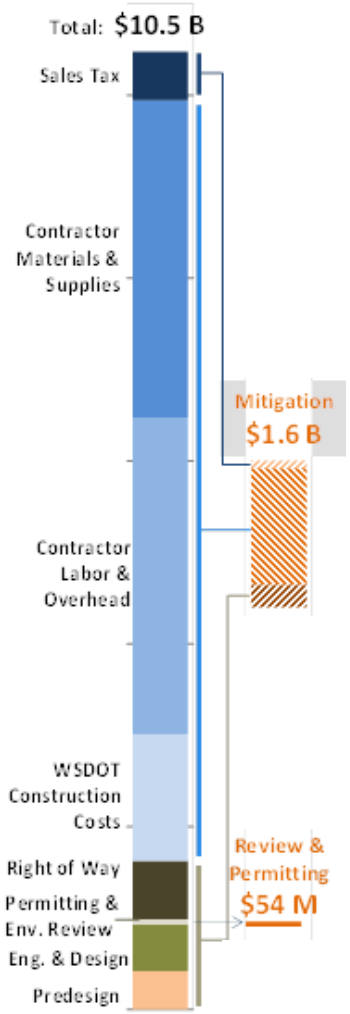
4. Establish a threshold below which WSDOT projects are not subject to the prevailing wage act

Potential Impact: LOW - potential wage savings; reduction in administrative burden; could produce more bids in some areas of the state if prevailing wage is a barrier
Lead Actor: Legislature

5. Modify how L&I sets the state rate.
a)Use federal rate as state rate; b) Use collective bargaining agreements as basis for state rate;
c) Require annual survey

Potential Impact: LOW – savings are in more efficient determination of prevailing wage; eliminate large jumps for those wages not set by collective bargaining agreements
Lead Actor: Legislature and L&I

Environmental Review and Permitting
Introduction

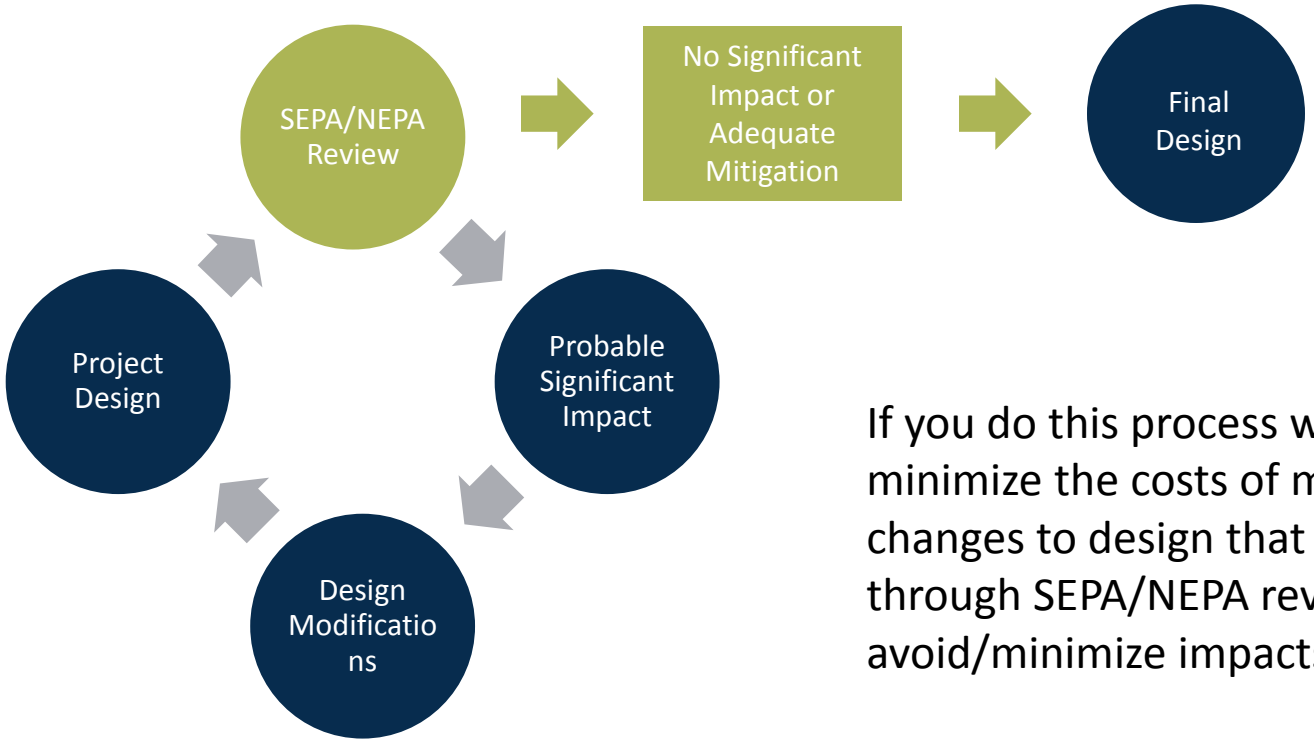


- **Environmental review** aids understanding of a project's impacts *consists of the range of proposed activities, alternatives, and impacts to be analyzed in an environmental document, in accordance with SEPA goals and policies*
- **Permitting** provides legal authority to proceed with commitment to address any environmental impacts that need mitigation
- **Mitigation** actions taken to avoid, minimize or mitigate environmental impact

- Note: WSDOT does not track mitigation costs on individual projects making it impossible to determine what portion of the total expenditures in our cost analysis reflected mitigation-related items. As a result, the study relied on WSDOT case studies completed in 2003, 2006, 2009 and 2013 to assess the role of mitigation costs. Based on these studies, mitigation-related costs acounted for an average of 16%..

Summary of Regulations and Process

- WSDOT projects are subject to environmental review and permitting regulations from federal, state, and local agencies
- For environmental review, NEPA and SEPA are the primary regulations that impact project design decisions



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
WSDOT Practices

- Vast majority of WSDOT projects are excluded from NEPA and SEPA review – in 2011-13, 94% of projects had a NEPA Categorical Exclusion and 84% of projects had Categorical Exemption from SEPA
- Some projects 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 – **this is one document**
- NEPA guidelines are often followed by WSDOT so that projects can qualify for federal funding in the future
- For smaller, routine projects, SEPA is more onerous. The SEPA checklist is more time consuming than the documentation prepared for Federal Highway NEPA Categorical Exclusions (CEs). SEPA adds some process on projects that require SEPA checklists and Determinations of Non-Significance that does not exist with NEPA CE projects (e.g., public notice, circulation, and 14-day comment period)
- Many efforts to streamline the permitting process have been implemented over the past decade
- Environmental review may increase public acceptance and lead to improvements/efficiencies in overall project design
    - Some communities find that SEPA is not stringent enough and that some impacts have gone unmitigated
- Legislative decisions could change state requirements, but tradeoffs would have to be considered

Environmental Review & Permitting
Potential Actions

1. Allow smaller projects that qualify for a NEPA categorical exclusion but not a SEPA categorical exemption to submit NEPA documentation only (and not the SEPA checklist).

- This would requires a change to the SEPA rules

Potential Impact: LOW – because it would affect smaller projects (lower costs)
Lead Actor: Legislature

2. Expand SEPA exemptions to match the NEPA categorical exclusions.

Potential Impact: LOW – would allow more small projects to submit NEPA categorical exclusion documentation only (and not a SEPA checklist).
Lead Actor: Legislature

Cost Driver Assessment

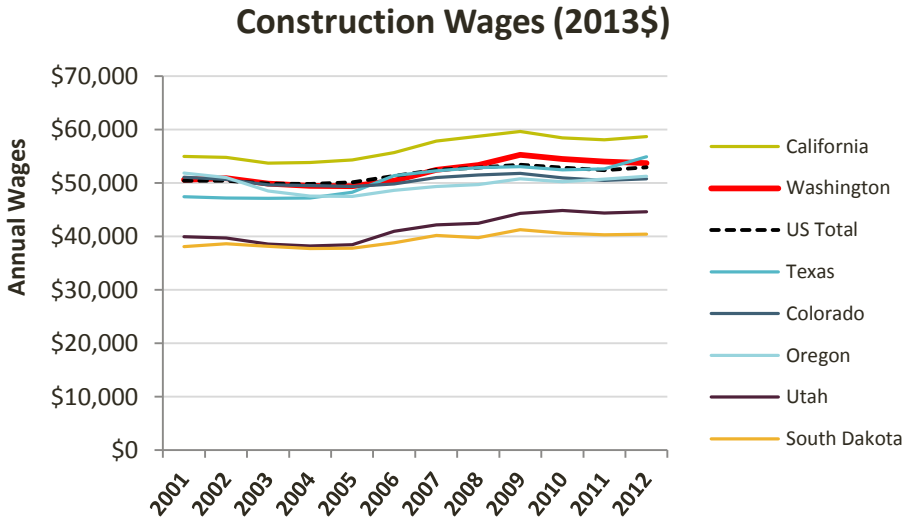
LABOR COSTS

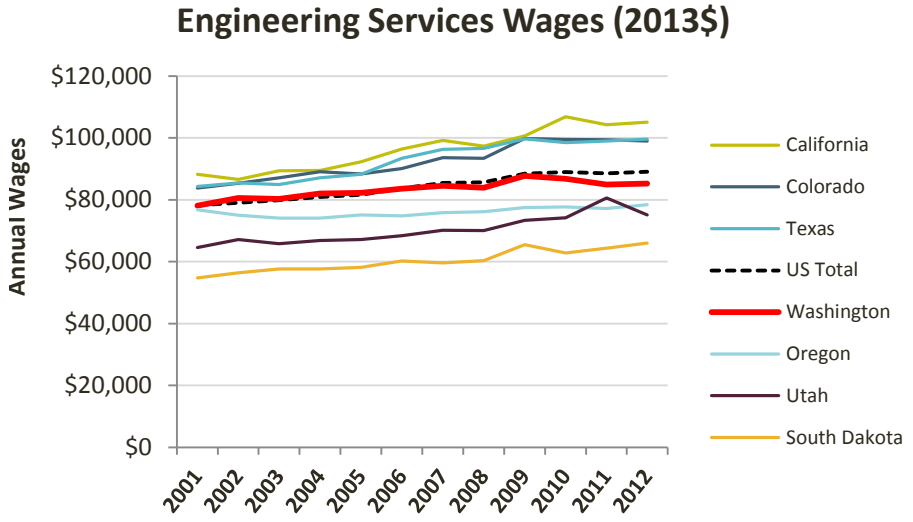
Labor Costs
Key Findings

- Overall wage levels (statewide average) in Washington's construction and engineering sectors are consistent with the national average. However, there is variation among states:
  - Construction labor rates vary from 23% higher (Massachusetts) to 26% lower (Idaho), excluding Alaska which has the highest construction labor rates in the US.
  - Engineering labor rates vary from 23% higher (California) to 27% lower (Arkansas).
- Based on industry averages, about 40% of construction contracts (approximately $2.8 billion over the study period) are comprised of labor costs.
- Additionally, a large portion of the cost of permitting, environmental review, predesign, engineering, design, and in-house construction also consists of labor.
- An important note is that the labor rates paid to construction contractors are set by the contractors themselves. WSDOT uses its competitive bidding process as a way to ensure it gets reasonable labor rates on its project. On average, WSDOT receives about 4.3 bids per award.

Labor Costs
Key Findings

- Overall average wages for construction and engineering service jobs in Washington are close to the national average (includes all construction sectors).
  - Construction Wages: Washington State average of $53,688 in 2012 (excludes benefits).
  - Engineering Services: Washington State average of $85,304 in 2012 (excludes benefits).
- Adjusted for inflation, wages in Washington have been consistent with national trends.





Labor Costs
Prevailing Wage Impacts

- The prevailing wage section previously focused on how changes to administration can improve process efficiency and potentially safe administrative costs.
- This analysis also analyzed whether prevailing wage requirements result in WSDOT paying more for labor.
  - Based on our analyses of prevailing wage and review of existing studies, there is no determination or consensus that prevailing wage generally adds to labor costs
- Although many changes were identified to improve the administration process, there is no definitive evidence that suggests prevailing wage actually increases labor costs at the program level.
- Where prevailing wage may have an impact on labor costs is in the more rural parts of the state where there are fewer contractors and the wage is set based on collective bargaining agreements used to cover a large geographic area.

Cost Driver Assessment

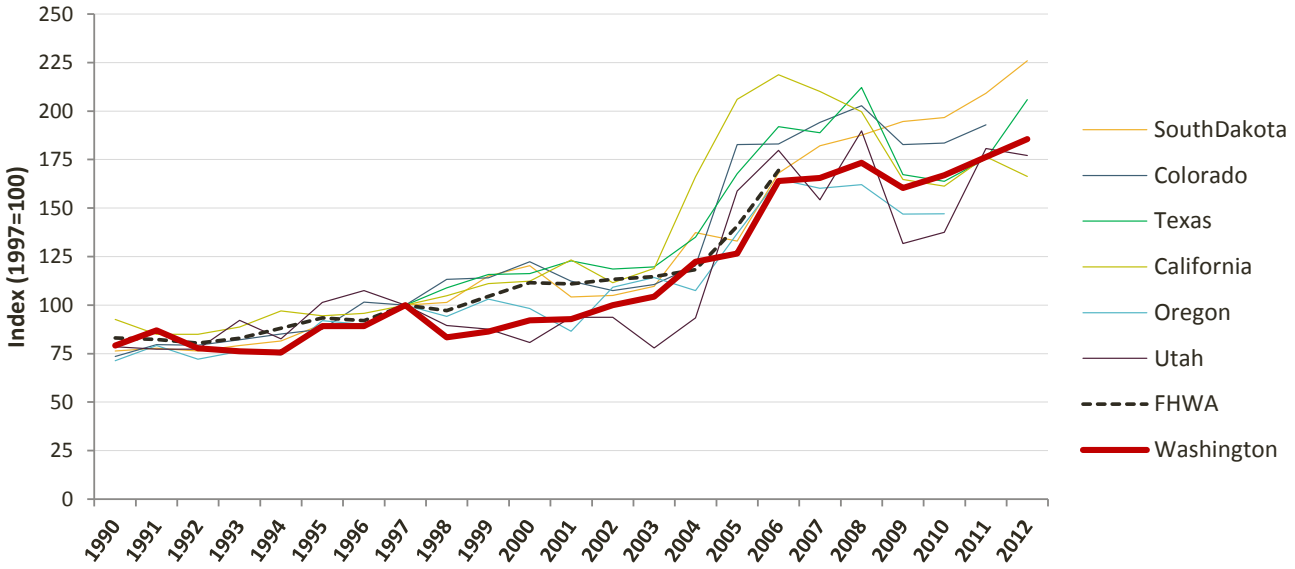
COST OF MATERIALS

Cost of Materials
Introduction

- Materials make up an average of about 50% of construction contract costs (approximately $3.5 billion over the study period).
- Some states maintain a Construction Cost Index (CCI) that tracks selected standard bid items over time. The CCI provides a point of comparison for construction cost growth across the nation, with the following limitations:
  - In Washington, CCI bid items represent 7 of potentially hundreds of bid items for a project. CCI bid items account for approximately 18% of total costs.
  - Each state's index generally includes a similar set of items, but specific definitions for items and methodologies for calculating the index vary by state.
  - FHWA stopped creating a composite index after 2006 due to the limited use and value of the index and questions about reliability of the data.
  - A 2007 FHWA reported that costs of commodities used in highway construction primarily varied across states due to the difference in the cost of transporting commodities.

Cost of Materials
Key Findings

- Based on the construction cost index analysis, WSDOT's materials costs have increased at approximately the same rate as national averages and with other states since 1990. However, there was variation between states.



- While materials are a large proportion of costs, WSDOT does not have significant control over the price of materials. Costs are set by the market, and interstate purchases of materials to achieve lower prices are typically negated by the costs of transporting it.
- When purchasing fabricated materials created off-site, there may be enough of a cost advantage through the combination of cheaper materials and lower wage rates out of state to offset transportation costs.

Cost Driver Assessment

RISK ASSIGNMENT

Project Delivery Methods
Method Selection

- Project method selection can impact project efficiency, project design, and cost. If WSDOT were able to leverage multiple project delivery methods, WSDOT could decide on a project by project basis:
  - Risk allocation between owner and contractor based on who is in the best position to manage it
  - Project delivery methods that best align responsibility based on project needs
  - Competitiveness of the bid process and management of construction to meet schedule and budget requirements
- Beyond selecting the appropriate project delivery method, it is important that for each available method there is a corresponding management and implementation structure in place to successfully apply the selected method

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

- 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

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
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

Contracting Potential Actions

1. Grant broad authority to WSDOT to determine project delivery methods
Lead Actor: Legislature

2. 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. (Mega-Project Assessment)
Lead Actor : WSDOT

3. 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. (Mega-Project Assessment)
Lead Actor : WSDOT

4. Modify existing WSDOT authority for Design-Build

- Complete analysis of 5 pilot projects and potentially lower the threshold from $10 million to $2 million
- Allow for projects of any size that meet the criteria

Lead Actor : Legislature

Contracting Potential Actions

5. Specifically authorize GC/CM project delivery for WSDOT projects (tailored to nature of highway projects)

- Learn from experience in other states since the procurement process is different and price is negotiated.

Lead Actor : Legislature and WSDOT

6. Apply the same rigorous risk assessment process to decisions about possible changes or modifications in the selection of a contracting method.

- On complex projects with multiple components and contracts, any change in contracting method or modification to a contract should be reviewed using the same level of risk assessment as the original selection. Documentation should identify how a change in approach benefits the State.

Lead Actor : WSDOT

Potential Impact of 1-6: Alternatives are related to shifting risk assignment and responsibility, which affects who pays for errors and cost overruns. While shifting risk does mean that it will be priced into contractor bids, it provides more budget certainty.

Contracting Potential Actions

7. Implement a pavement warranty program

Potential Impact: Potential savings to contractors with respect to time and to WSDOT with respect to staff.
Lead Actor : WSDOT

8. Give Design-Build contractors additional design flexibility to support innovation and cost containment by not restricting them to the Design Manual but that consider lifecycle costs

Potential Impact: Could potentially lead to more cost effective solutions based on current conditions in materials prices or state of the practice.
Lead Actor : WSDOT

Cost Driver Assessment

OTHER POTENTIAL ACTIONS

Other Potential Actions

Finding: There were many questions posed in this study that were difficult or not possible to reasonably address due to lack of data or incomplete information. Some of these questions inform important policy and management issues.

Possible Action: Improve data collection and management to better inform management and policy choices.

- Particularly relevant to mitigation costs, change order documentation, right-of-way acquisition, environmental review and permitting and prevailing wage.

Lead Actors: Legislature and WSDOT

Finding: WSDOT spreads its federal funds throughout its program which added federal aid project conditions to 82% of its projects completed between 2003-2012.

Possible Action: Focus federal funds in fewer projects to limit the impact of federal aid conditions on WSDOT project costs**.**

- A major challenge for WSDOT in this regard is the general lack of flexibility to move funds between projects. For example nickel funds are limited to nickel projects, so to consolidate federal funds on a nickel project likely requires switching money primarily among other nickel projects

Lead Actors: Legislature and WSDOT

Next Steps

- Finalize remaining cost analysis components as necessary if additional data becomes available
- Send out Draft Report for review and comment (by January 7)
- Presentation to JTC (January 8)
- Issue Final Report