

Practical Design Report

2016 Annual Practical Design Savings Report
Submitted with the 17-19 agency budget request

On behalf of the Washington State Department of Transportation (WSDOT), this report is the first of a series of annual reports summarizing practical design savings to date on Connecting Washington (CW) funded projects. This report was prepared in a manner consistent with the requirements outlined in RCW 47.01.480 (1)(c).

This report is intended to provide information to the Office of Financial Management and the legislature regarding how practical design has been applied to CW projects and savings remaining at the completion of a CW project.

Since we are very early in the delivery of the CW program and only a few projects are currently in construction, no projects have been fully completed and closed out to identify a final savings amount.

Background

As part of the CW new revenue funding package passed by the Legislature and signed by the Governor in July 2015, Engrossed Substitute House Bill (ESHB) 2012 was enacted and codified as RCW 47.01.480 and RCW 47.01.485. This law provides direction on performance and reporting expectations on implementing practical design for CW-funded projects. The law requires two reports to be completed on a recurring basis, the first report was sent on July 1, 2016 and is due every six months thereafter identifying any practical design savings, retired risk and unused contingencies. The second report is required annually with the department's budget submittal and includes the savings mentioned above plus the addition of savings generated through scope changes, associated impacts on risk and changes in the cost of materials.

This annual report, due with the budget submittal, requires information on practical design savings, scope changes and associated impacts on risk savings, cost of materials savings, unused contingency, and retired risk savings. The specific language for the annual report is as follows:

RCW 47.01.480 (1)(c) -Each year as a part of its annual budget submittal, the department must include a detailed summary of how practical design has been applied and the associated savings gained. The annual summary must also include for each project: Details regarding any savings gained specifically through changes in the cost of materials, changes in the scope of a project and associated impacts on risk, the retirement of any risk reserves, and unused contingency funds.

Furthermore, the law outlines the basic methodology associated with how the practical design savings element of the report should be calculated. The following is an excerpt from the law:

RCW 47.01.480 (1)(c) - To determine the savings attributable to practical design, each connecting Washington project must be evaluated. For design-bid-build projects, the evaluation must occur at the end of the project design phase. For design-build projects, the evaluation must occur at the completion of thirty percent design...

Given the above direction, the reporting requirements associated with this annual report includes elements which are to be reported at the completion of the project design phase (savings attributable to practical design), changes in scope and associated impacts on risk and project construction (materials cost, retired risk and unused contingency funding). Since WSDOT often delivers legislative line-item projects using multiple construction contracts, the final reporting element (savings available to transfer) will not be available until the last construction contract to deliver the legislative line-item project has been completed.

Furthermore, this report does not convey a complete summary of events associated with the quality, efficiency, and/or challenges of project delivery. For example, the report does not include information comparing the winning project bid to the engineer’s estimate at contract award and the risks which are either mitigated or materialized. WSDOT assumes that other existing reporting mechanisms will provide this additional information on project delivery.

The report includes Connecting Washington line-item projects in the following programs: Highway Construction Improvement, Washington State Ferries Capital, Rail Capital, Facility Capital and Local Programs Capital as reflected on the latest legislative project list once design is completed.

Programmatic items included in the legislative project list such as the Highway System Preservation, fish barrier removal, ferry vessel and terminal preservation, grant programs for bicycle/pedestrian, and transit and rail projects are assumed to be fixed levels of investment intended to deliver as much of the identified work as possible over the 16-year period. Therefore, programmatic entries will not be included in this report.

Additionally, to effectively capture the savings attributable to practical design decisions WSDOT will remove the impact of inflation from the calculation of project savings. The detailed information in these reports will capture practical design savings based on a constant dollar comparison between the original (uninflated) legislative project budget and the (uninflated) project estimate at the time of advertisement.

Furthermore, WSDOT assumes that the issuance of the Request for Proposal (RFP) represents completion of 30 percent design for calculating the savings attributable to practical design on design-build projects.

Additional assumptions associated with this report include:

- Projects that have already been designed using non-CW funding and have only construction funded through CW will not have any practical design savings reported. Savings from these projects will be reflected in other currently required reporting elements.
- Changes in scope and associated impacts on risk will be reported when the project is advertised.
- Projects where CW does not fully complete the design of a project will be reported on at the end of the design phase or when available funding is used, whichever comes first. Other required reporting elements will not be reported on until construction funding becomes available.
- Planning studies for which there is unused funding will be included in this report at the conclusion of the study.

- Local projects will be “self-reported” by the local jurisdiction to WSDOT’s Local Programs Office and will be compared to the most recent available project cost estimate.

Report Details

Attachment A provides a summary of the conversion of the legislative project budget to constant dollars for comparison to the engineer’s estimate at the time of construction advertisement.

Attachment B provides a summary of the CW projects which have completed design and have one or more required reporting elements available to report. At this stage of CW project delivery, only the savings attributable to practical design and the effect of scope changes and associated impacts on risk can be reported. Of the five WSDOT-led projects, three were previously designed with non-CW funding and show no practical design savings. One, the Euclid Ave. Administration Facility Consolidation Project has no practical design savings based on the constant dollar comparison approach and the low-bid exceeded the engineers estimate at advertisement. One of the projects previously designed with non-CW funding, the I-405/SR 167 Direct Connector Project, shows no practical design savings even though the low-bid was significantly lower than the engineers estimate at advertisement. The last project, Schouweiler Road, shows no practical design savings because the engineer’s estimate was greater than the legislative budget.

Cost of material savings, unused contingency, retired risk savings have yet to be determined until such time that the projects complete construction.

Implementing Practical Solutions throughout WSDOT

Practical solutions strategies (which included practical design) are applied throughout the project development and delivery process. Where practical solution refinements are identified in the process will determine whether savings are due to cost avoidance (i.e. an initial lower project estimate to be funded than otherwise anticipated) or a reduction to a project budget (i.e. project savings which occurred after the initial project estimate was funded).

Practical design applications begin during the scoping and pre-design stage of project development. During this stage, agency pre-design efforts are funded from non-project resources rather than from a specific project budget. Practical design savings through cost avoidance are removed from the project estimate prior to establishing the initial project budget. After the initial project budget is established and design begins on that project, practical design can result in reduced costs to deliver the project. Assuming no inflationary increases on the project over its delivery schedule, and assuming no unforeseen project challenges, the reduced delivery cost should result in project savings.

It is important to recognize that greater savings are often generated through practical solution and practical design efforts during the earlier stages of project development, prior to the project receiving funding. This concept has been documented, in part, in the 2010 JLARC report on WSDOT scoping and cost estimating for highway construction projects. As WSDOT continues to refine its approach to implementing practical solutions and practical design, we expect to observe a diminishing level of savings. This is due to future projects being developed from their inception utilizing these principles. In other words, we will not have potentially over-designed projects to compare to those projects that were developed using practical design. This will result in fewer savings being available over time from funded projects. Although the projects in this annual report have no practical design savings to report, these and many other projects have utilized practical design in the scoping and implementation of

projects to avoid costs and provide value for the taxpayers. The WSDOT led projects in this report have implemented practical design as follows:

- **SR 224/SR 225 Benton City Roundabout** - The purpose of this project is to improve traffic flow and reduce the risk of collisions at the intersection of SR224 and SR225 in Benton City, WA. This is the first of two phases of the overall project listed as 'I-82 West Richland – Red Mountain Interchange' in the 2015 legislation. Several alternatives were evaluated and a roundabout with auxiliary ramps to accommodate the heavier traffic was selected as the best option to meet the project needs. As the project progressed through the design phase, the footprint of the roundabout was reduced by eliminating all but one of the slip ramps. In addition, low cost storm water treatment options requiring minimal maintenance were incorporated in the project to keep on-going maintenance costs down. At bid opening, the winning bid was \$159.2 thousand under the engineer's estimate.
- **I-405/SR 167 Direct Connector – Widening** - The need for this project is to alleviate excessive congestion with HOV traffic weaving across the general purpose lanes to access the off ramps at northbound I 5 and southbound SR 167. A direct connector was proposed to eliminate these HOV weaves by connecting the northbound and southbound HOV lanes. This project is a design build project and has gained practical design benefits before and after the execution of the contract. As part of bid opening, the winning bid was \$89.1 million lower than the engineer's estimate. Currently, the project is working through a practical design workshop with the winning bidder to evaluate additional potential applications of design modifications and associated savings.

The I-405 Program has a long history of implementing practical solutions, dating back to the development of the multimodal Master Plan in 2002. Early on, the I-405 team did ongoing engagement with stakeholders to reach agreement on cost-effective solutions, including meetings with corridor committees, design charrettes and the Context Sensitive Solutions process. During preliminary engineering, WSDOT achieved cost savings by shifting the levels of the interchange ramps to shorten bridge structures, and minimize the roadway footprint through work with FHWA and local agencies. Additional ideas emerged when the project team presented the project to internal WSDOT peer groups, including use of LED lighting, a reduction to the SR 167 southbound footprint to avoid right of way acquisition, and exploration of incorporating practical solutions into the design-build process. During the design-build procurement process, the contractor proposed innovative alternative technical concepts (ATCs) to further reduce the project footprint. Additionally, WSDOT took the new step of incorporating a practical design pause period into the contract, which took the form of a Practical Design Workshop with WSDOT and the design-builder after award. These meetings yielded a number of ideas that primarily reduce the project footprint and modify some structures. This new process allows the contractor and WSDOT to collaborate on additional project savings.

Other practical design benefits included in the project are: reduced lane and shoulder widths on SR 167 while maintaining an adjacent major north-south city arterial; the NB I-405 Talbot on-ramp was narrowed and the construction of new wall was significantly reduced; and the SB I-405, ground improvements were eliminated by not needing to widen the SB Talbot overcrossing.

- **Schouweiler Road Improvements** - The purpose of this project is to improve access and safety to and from Schouweiler Road on US 12. The initial scope included improving channelization for all traffic movements at an estimated cost of \$3M. The project funding was approved at \$1.55M. The project team first evaluated the existing operational performance and safety of the intersection to define the project need. Community engagement through an open house, school board presentation and door knocking included soliciting feedback on a variety of options being considered. Through this practical design process, four traffic movements were identified as critical to meeting the baseline needs of the community and were constructible within available funds. At bid opening, the winning bid was \$111 thousand under the engineer's estimate.
- **Euclid Ave Administration Facility** - Practical design was used to keep the project within the available budget by identifying reductions of the originally planned building which was over budget. One of the factors that may have affected achieving the target design savings goal is a recent rise in construction costs. Due to the rise of construction costs, practical design was utilized to find savings that reduced the overall cost of the project and brought it within budget. As a result of this effort, office and archive storage spaces sizes were reduced, reduced parking spaces and conference rooms, reduced the quality of trim, countertops and doors, and reduced landscaping. It is also worth noting that, as a Design Build Project, the savings reporting milestone (Ad Date) occurs at publication of the RFP. Design is approximately 20%-30% complete at this point. Further savings may be achieved as the design phase is completed with the design-builder. Both bidders were over the upset price for the project. WSDOT is working with the bidders through a Best and Final Offer process that anticipates award in October 2016.
- **#4 – 144 Capacity Vessel** – The need for this project and the other 3 vessels in this class is to modernize the ferry fleet and retire older vessels that are at the end of their lifecycle. Prior to beginning design, WSDOT met with stakeholders including affected cities and counties, elected officials, ferry employees, businesses, ferry advisory councils and ferry riders to solicit ideas and understand and address the various needs associated with all of the stakeholders leading to such improvements as reducing tripping hazards by installing hand rails away from walkways and passenger areas, larger lane widths to accommodate commercial truck loading and wider access paths from the bows to the elevators to provide improved ADA access. Additionally, the vessels were designed/constructed using a modified design-build approach which put more risk on the contractor, allowed for greater innovation in constructing the vessels and significantly reduced WSDOT's oversight (staffing) on the project. The result is a 4 vessel class of boats that are nearly identical leading to reduced costs for maintenance, crew training, preservation, and most activities involving operation of the vessels.

The projects above are good examples that illustrate WSDOT's commitment to use practical design not only to reduce the cost of constructing projects, but also to reduce long-term costs of operating and maintaining our transportation system. While this annual report does not indicate any practical design savings on CW projects, practical design continues to play an important role in defining and delivering transportation projects.

Attachment C, "Practical Solutions for Washington's Transportation System" provides additional information about efforts within WSDOT to implement practical solutions.

Please contact Nancy Boyd, Director of Engineering Policy and Innovation at (360) 705-7259 or boydn@wsdot.wa.gov regarding the implementation of Practical Solutions within WSDOT. For questions on the funding and financial information contained in this document, please contact Jay Alexander, Director of Capital Program Development and Management at (360) 705-7121 or alexanja@wsdot.wa.gov.

Attachments

Constant Dollar Conversion Assumptions for Calculating Savings Attributable to Practical Design

Leg BIN ¹	Project Title ²	Legislative Project Cost Estimate in YOE \$ (inflated)	Legislative Cost in 2014 \$ (uninflated) ⁴	Engineers Est. at AD in 2014 \$ (uninflated) ⁵	Practical Design Savings ⁶	Detailed Summary on Application of Practical Design
<u>Highway Construction - Improvement Program</u>						
T104000	I-82 West Richland - Red Mountain Interchange	28,400,000	25,076,000			
	SR 224/SR 225 - Benton City - Construct Intersection Improvements		3,326,000	3,236,000	0 ⁷	The footprint was reduced and all but one of the slip ramps were eliminated. Low cost storm water treatment was incorporated reducing on-going maintenance cost.
	I-82/Red Mountain Vicinity - Construct Interchange		21,840,000			
M00900R	I-405 Renton to Lynwood - Corridor Widening	1,225,000,000	1,029,268,000			
	I-405/SR 167 Direct Connector - Widening		255,995,000	255,995,000	0 ⁷	The project foot print was reduced, construction of a new wall was significantly reduced, avoided widening of an overcrossing and incorporated LED lighting.
	I-405/Renton to Bellevue - Corridor Widening (Additional construction packages yet to be determined)		773,273,000			
N01200R	Schouweiler Road Improvements	1,550,000	1,489,000	1,539,000	0	Reduced the project to 4 traffic movements that met the communities baseline needs.
<u>Ferry - Capital Program</u>						
L2000109	#4 - 144 capacity vessel	122,000,000	111,585,000	111,585,000	0 ⁷	Reduced construction costs by taking advantage of the shipyards experience by continuing with the 4th vessel. Reduced WSDOT oversight by using design-build and reducing the number of inspectors needed. Reduced long-term maintenance and operating costs by standardizing vessels.

Facilities - Capital Program

L2000079	Euclid Ave Administration Facility Consolidation Project	12,000,000	11,478,000	11,478,000	0	Reduced office and archival storage space sizes and the number of conference rooms, reduced the quality of trim, countertops and doors, reduced landscaping and parking spaces
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Leg BIN¹	Project Title²	Legislative Project Contribution	Local Jurisdiction Self-Reported Savings⁸
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Local Programs⁸

NRUCKER	41st St Rucker/Ave Freight Corridor in Everett	1,500,000			0
L2000080	SR-203/Coe-Clemons Culvert Replacement	500,000			0
L2000200	28th/24th Street Sea-Tac	2,000,000			0
L1000133	Lyon Creek Culvert	875,000			0
L2000218	Jovita Seismic Wall	1,000,000			0

*Project data as of 6/30/2016; Each annual report will reflect cumulative project deliver information as of the report date. Projects will begin showing on this report following construction advertisement.

¹This is the legislative project identification number.

²Project title as portrayed in the 2016 legislative project list is shown in bold. In many instances, the legislative project is delivered using multiple construction contracts. Where applicable, the more detailed agency project is shown below the bolded legislative project. Each of the more detailed construction projects within a legislative project is reported on as construction contracts are advertised.

³Total project cost as portrayed in the 2016 Legislative project list in Year of Expenditure (YOE) dollars.

⁴Legislative project cost portrayed in 2014 current year dollars.

⁵Engineers estimate of total project cost at advertisement portrayed in 2014 current year dollars.

⁶Practical design savings are reported following construction advertisement in nominal dollars; prior to the completion of construction. Practical solutions are calculated by comparing the legislative uninflated project cost estimate with the uninflated project estimate at advertisement or release of a Request for Proposal (RFP) for design-build projects. The two uninflated project estimates are stated in the same year current dollars for calculating the practical design savings exclusive of inflationary impacts.

⁷Connecting WA funded the construction phase only. No practical design savings are applicable to construction only funded projects.

⁸Information on Connecting WA projects managed by local jurisdictions reflect information as self-reported by the respective local jurisdiction.

Annual Project Savings Report

RCW 47.01.480 (1)(c) requires the department to submit a report annually with the submittal of the agency proposed budget that identifies the amount of savings attributable to practical design, retired risk, cost of materials, scope changes and associated impacts on risk and un-used contingencies on Connecting Washington projects. RCW 47.01.480 (1)(c) also directs the department to include a detailed summary of how practical design has been applied and the associated savings gained.

Leg BIN ¹	Project Title ²	Practical Design Savings ³	Scope Changes & Associated Impacts on Risk Savings ⁴	Cost of Materials Savings ⁵	Unused Contingency ⁶	Retired Risk Savings ⁷
Highway Construction - Improvement Program						
T104000	I-82 West Richland - Red Mountain Interchange SR 224/SR 225 - Benton City - Construct Intersection Improvements	0 ⁸	0 ⁴	TBD ⁹	TBD ⁹	TBD ⁹
M00900R	I-405 Renton to Lynwood - Corridor Widening I-405/SR 167 Direct Connector - Widening	0 ⁸	0 ⁴	TBD ⁹	TBD ⁹	TBD ⁹
N01200R	Schouweiler Road Improvements	0	0 ⁴	TBD ⁹	TBD ⁹	TBD ⁹
Ferry - Capital Program						
L2000109	#4 - 144 capacity vessel	0 ⁸	0 ⁴	TBD ⁹	TBD ⁹	TBD ⁹
Facilities - Capital Program						
L2000079	Euclid Ave Administration Facility Consolidation Project	0	0 ⁴	TBD ⁹	TBD ⁹	TBD ⁹
Local Programs¹⁰						
NRUCKER	41st St Rucker/Ave Freight Corridor in Everett	0	0 ⁴	TBD ⁹	TBD ⁹	TBD ⁹
L2000080	SR-203/Coe-Clemons Culvert Replacement	0	0 ⁴	TBD ⁹	TBD ⁹	TBD ⁹
L2000200	28th/24th Street Sea-Tac	0	0 ⁴	TBD ⁹	TBD ⁹	TBD ⁹
L1000133	Lyon Creek Culvert	0	0 ⁴	TBD ⁹	TBD ⁹	TBD ⁹
L2000218	Jovita Seismic Wall	0	0 ⁴	TBD ⁹	TBD ⁹	TBD ⁹

*Project data as of 6/30/2016; each annual report will reflect cumulative project delivery information as of the report date. Projects will begin showing on this report following construction advertisement.

¹This is the legislative project identification number.

²Project title as portrayed in the 2016 legislative project list is shown in bold. In many instances, the legislative project is delivered using multiple construction contracts. Where applicable, the more detailed agency project is shown below the bolded legislative project. Each of the more detailed construction projects within a legislative project is reported on as construction contracts are advertised.

³Practical design savings are reported shortly following construction advertisement; prior to the completion of construction. Practical solutions are calculated by comparing the legislative uninflated project cost estimate with the uninflated project estimate at advertisement or release of a Request for Proposal (RFP) for design-build projects. The two uninflated project estimates are stated in the same year current dollars for calculating the practical design savings exclusive of inflationary impacts. Full details of uninflated estimates will be included in the report that accompanies the annual agency budget request.

⁴Scope changes and associated impacts on risk will be calculated as the changes are approved by legislature. Actual savings will be known when the project is completed.

⁵Changes in the cost of materials will be calculated and reported at the completion of the project.

⁶Contingency funds established with each construction project consistent with WSDOT policy and standard industry practice. Unused contingency funds will be reported at the completion of the project.

⁷Risk reserves are established for larger construction projects for identified potential construction delivery risks, consistent with WSDOT policy and standard industry practice. Risks that are unrealized are retired and the funding remains on the legislative identified project until completion of the entire legislative scope of work is completed. Unused risk reserves will be reported at the completion of the project.

⁸Connecting WA funded the construction phase only. No practical design savings are applicable to construction only funded projects.

⁹The project is currently in construction. Actual savings for unused contingency, unused risk, materials cost and scope changes will be known when project is completed.

ATTACHMENT C



PRACTICAL SOLUTIONS FOR WASHINGTON'S TRANSPORTATION SYSTEM

Roger Millar

Secretary of Transportation

Washington State Department of Transportation

July 1, 2016

OVERVIEW

The 2015 Legislature approved the Connecting Washington transportation plan that included an 11.9-cent gas tax increase to improve congestion, enhance economic development and improve safety. This \$16 billion investment over the next 16 years includes:

- \$9.4 billion for state highways and local roads
- \$1.2 billion state highway operations and preservation
- \$1.3 billion for non-highway projects such as bike paths, walkways, rail and transit
- \$602 million for ferries and terminals
- \$300 million for fish barriers
- \$100 million for state highway maintenance
- \$50 million for state highway traffic operations

A cornerstone of this investment plan is to use Practical Solutions to plan, design, and construct projects. Anticipated cost savings will be used to fund future preservation and improvement needs. Practical Design is an element of Practical Solutions.

In the Connecting Washington legislation (ESHB 2012), WSDOT is asked to provide a detailed summary of how Practical Design has been applied and the associated savings gained, as part of the agency's budget development process. In addition, WSDOT is required to report to the State Treasurer every six-months on: the amount of savings attributed to the application of Practical Design, retired risk and unused contingency funds, and when the savings are available so funding can be transferred to the Transportation Future Funding Program Account.

This report describes the intent of legislation for Practical Design as it applies to specific Connecting Washington projects and WSDOT's efforts to expand the approach to find Practical Solutions in all aspects of our business process: asset management, multimodal transportation systems operations, planning and design, and project construction practices.

BACKGROUND

WASHINGTON CITIZENS OWN A VALUABLE ASSET- OUR TRANSPORTATION SYSTEM

Generations of women and men have worked to plan build, operate and maintain a multimodal transportation system to serve Washington citizens and businesses. These assets include:

- 18,689 total lane miles of state highways
- 3,600 bridge structures

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- 118 miles of bike lanes on state highways
- The largest ferry system in the nation moving 23 million passengers and 10 million vehicles a year
- 31 public transportation systems to provide more than 220 million passenger trips a year
- Three Talgo train sets in the Amtrak Cascades fleet and management of the Palouse River and Coulee City Rail systems
- The world's widest tunneling project and the world's longest floating bridge project.

Washington citizens have invested billions of dollars in projects to build and expand the highways to accommodate more people and businesses in our state. The resulting transportation system has been very effective in supporting the state's communities and economy. But we can't keep building our way out of congestion, as the number of drivers continues to increase at about 1 percent per year in our state.

Mid twentieth century transportation decisions were made to keep up with population and economic growth by expanding transportation systems. Today, we have more knowledge and better tools to make smart decisions that give us new, low cost, sustainable solutions. For example, strategies to keep the assets we have in a state of good repair to avoid high replacement/repair costs. Real time Information to give travelers choices. A new era of transportation technology – intelligent transportation systems, driverless vehicles, connected vehicles, drones to deliver products and services – promise to make the existing transportation system operate more efficiently. We use data as the basis for making intelligent decisions. Our methods to communicate are advanced through the Internet and social media.

Given these circumstances, today's transportation managers seek solutions that are practical, innovative and use the best information, data and practices to meet the mobility needs of today, as well as future generations.

Washington's legislature enacted the 2015 Connecting Washington revenue plan requiring Practical Design for projects funded through the 16 year program. WSDOT is implementing this direction through its Practical Solutions approach. Characteristics of Practical Solutions involve:

- Moving to a performance-based approach to solving transportation problems;
- Using data, new tools and best practices to preserve and maintain existing assets so that they last longer;
- Using more comprehensive tools and performance measures to support decision making, rather than using limited data such as the volume of current traffic or safety history;
- Establishing a multidisciplinary, multijurisdictional, collaborative approach to decision making so that we don't just consider highways, but look at the entire transportation system of local roads and streets, arterials, transit, bike and pedestrian facilities, rail, air and marine;
- Enhancing community engagement efforts to craft least-cost solutions within the context of land use;
- Considering operational and demand management strategies before high cost capital projects are committed;

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- Implementing low-cost solutions sooner, rather than waiting years for a high-cost project to be funded;
- Using sustainable transportation practices to preserve the environment, promote transportation system efficiency, seek fiscally efficient solutions, improve and protect public health, conserve energy and reduce greenhouse gases.

WSDOT is making significant progress transforming its policies and programs to make this paradigm shift towards managing assets and working with our partners to develop low-cost solutions to improve mobility throughout our state. Of course, there is still more to be done.

While savings for the newly approved projects will take time as projects are completed, we are looking for additional opportunities to use Practical Solutions through cost avoidance and efficiencies throughout the transportation lifecycle.

PRACTICAL SOLUTION OPPORTUNITIES FOR THE TRANSPORTATION SYSTEMS LIFECYCLE

Washington State Department of Transportation is a leader among the handful of state transportation agencies in the country to use an approach we call Practical Solutions. This approach creates policies, procedures and practices affecting all aspects of the state's transportation program, targeting investments to improve mobility, safety and access to transportation options. The goal is to achieve savings and efficiencies by making decisions throughout the transportation system's lifecycle, using collaboration to find the lowest cost and effective solutions.

MAINTAINING AND PRESERVING OUR ASSETS

WSDOT is taking a strategic approach to cost-effectively and efficiently preserve the highway, bridges, ferries and other assets that must be maintained for future generations. Investment strategies aim to maintain and preserve transportation infrastructure on an ongoing, systematic basis. This approach will save money while maximizing performance. The State Transportation Asset Management Plan (STAMP) views assets as a system or network, rather than each asset independently. This framework prioritizes spending where it will do the most good and gets the citizens of Washington the best value for their dollars.

Using facility performance criteria, triggers are established to identify when maintenance or preservation is required. Because there is not enough funding, the challenge is to not delay routine maintenance so long that assets continue to age and deteriorate. Delay too long and it may require costly reconstruction or replacement. Our approach is to consider the potential risk of failure along with the historic asset performance evidence to prioritize problem areas before they become critical, rather than wait for the asset to fail. Routine maintenance and preservation activities extend the life of the asset. Any future reconstruction or replacement required is therefore planned and prioritized within funding programs.

OPERATING SAFE AND EFFICIENT MULTIMODAL TRANSPORTATION SYSTEMS

Low cost efficiencies in operating highways, ferries, transit and rail, and reducing travel demand save money and avoid building costly new capacity. Highway traffic operations can be made more efficient with features like ramp meters, driver signs and messages, incident response and, in some cases, re-striping, adding a turn lane, or other enhancement.

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Transportation demand strategies help get the most out of the transportation infrastructure and services by encouraging people to use lower cost, high-efficiency transportation options. Active transportation promotes better health and helps reduce the demand for high cost infrastructure. Key to making active transportation a viable option is a system that allows users to move seamlessly between modes. For example, a commuter might ride a ferry, walk to a bus stop, ride a bus and then finally walk the final leg of their journey to work.

Major employers, education, businesses, social services, and residential destinations all affect and are affected by the entire transportation system and the communities that use it. For WSDOT and our local partners, this means a continued evolution from a focus on a single roadway, highway or transit route toward collaboration focused on transportation system performance and thriving communities.

STAKEHOLDER COLLABORATION RESULTS IN PRACTICAL SOLUTIONS

Community engagement is a key factor in helping to develop Practical Solutions. Community engagement facilitates learning about other viewpoints, sharing of information with all the stakeholders so that alternatives can be fully considered, reduces conflicts between interests and helps to gain support for the right solution. The goal is to fully engage partners and the affected community in the decision making process. Practical Solutions are found when we work together to identify the purpose of action, assess data from all parts of the system, and examine a range of options before investment decisions are made.

WSDOT has used a Least Cost Planning approach with communities for the past several years. The first step in the collaboration is to set the performance measures or indicators for how the multimodal transportation system is supposed to perform. For example:

- Safety performance, frequency of accidents
- Operational performance including levels of time delays, increased traffic levels
- The community's sense of place, safety, and public health
- Economic development and revitalization opportunities
- Environmental factors like air quality, open space, public health and greenhouse gas emissions
- Opportunities for affordable housing and mixed income communities
- Land use and growth management plans by local jurisdictions
- Active transportation choices such as walkability, accessibility and other modal transportation choices
- Once the stakeholders define these measures, strategies or alternatives can be analyzed to determine the best value for the money.

WSDOT is also a partner in regional and community-led transportation planning and operations. To assist with their analyses and decisions, WSDOT brings background information on each state highway corridor. A new "Corridor

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Sketch” process is being used to present a range of strategies developed through least-cost/ performance-based planning. WSDOT is working on developing these sketches across the state to identify practical strategies and solutions that reflect a community’s character. Developing the corridor sketches also provides a framework to engage partners and transportation service providers about the needs of their communities and strategies for transportation improvements in the corridor, regardless of mode/jurisdiction. The results will inform the State Highway System Plan to identify long term needs and costs, and also allow transportation funding to be targeted to the right-size solution. Funding for the solutions can then be found in local, regional, state and federal funding sources.

FLEXIBLE PROJECT DESIGN STANDARDS

WSDOT is taking significant steps towards reorganizing how project development proceeds during the design process, making sure that transportation and community needs are translated into performance, and that critical design decisions are based on a more multidisciplinary and collaborative approach. The goal is to find better alignment between community planning and transportation objectives, and prevent the type of reexaminations and rework that has occurred in the design phase of our complex projects in the past.

Recent design policy and technical guidance focuses on creating tools and procedures that better support the type of performance-based decisions that are consistent with the Practical Solutions approach. The 2015 Design Manual update outlines a uniform approach to design and communicates other vital information to engineering staff and consultants. Changes include guidance on examining and confirming the need for a project, considering the context and community input about a project, and an approach to translating these needs and concerns into performance metrics and targets.

In the past, simplifying assumptions made early in design, such as when to increase lane and shoulder widths, may have contributed to increased project costs that are disconnected from the actual need for the project or community. Community engagement and staff recommendations are used to help determine how design elements are best employed, using the agreed upon performance targets to achieve the Practical Design.

WSDOT staff is expected to evaluate and document the tradeoffs associated with difficult design decisions, considering the implications of these decisions, and leveraging early opportunities to identify and incorporate innovative designs. A new documentation tool, called Basis of Design, has been developed to support the focus on Practical Solutions, and is being used across the state on Connecting Washington and other projects. These projects involve collaborating with discipline experts and communities to define the best project, securing partnership opportunities, and identifying Practical Design savings. As these designs advance towards advertisement and construction in 2016 and beyond, more projects will be reporting Practical Design savings and collaborative successes.

BETTER CONSTRUCTION PRACTICES

The traditional method of contracting highway construction projects involves WSDOT taking the role of “engineer of record” and developing a full set of plans, specifications and estimates for the project. The private contractors then bid on the project and the low-bid contractor is selected. This design–bid–build process resulted in more than half of FY2015 WSDOT contracts awarded below estimates.

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Another method of contracting called design-build delivery, shifts the role of engineer of record to the contractor. WSDOT uses practical planning and design efforts to create project standards and specifications that define the scope of the project. With a well-defined scope, WSDOT uses a selection process to pick a best value contractor/designer team who will serve as both engineer of record and contractor for the project.

WSDOT is piloting a Practical Design workshop on two upcoming design-build projects. After the contractor selection process is complete, but before design and construction take off, the workshop provides a “pause” in the process where WSDOT and the design-build contractor can meet and discuss Practical Design opportunities on the project. It is envisioned that both the contractor and WSDOT will bring their key design and management staff to this workshop for an open dialog about opportunities to reduce cost, shorten the schedule, lower project risk, etc. incorporating Practical Design principles. The structure of the workshop allows for open dialog and brainstorming that really isn't possible during the selection process or once the design/ construction process begins. WSDOT will monitor these two pilot projects; if the Practical Design workshops add value to these projects, we will expand its use to future design-build projects.

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SEMI-ANNUAL PROJECT SAVINGS REPORT

As part of the Connecting Washington (CW) new revenue funding package passed by the legislature and signed by the Governor in July 2015, Engrossed Substitute House Bill (ESHB) 2012 was enacted and codified as RCW 47.01.480.

This law provides direction on performance and reporting expectations on implementing Practical Design for CW funded projects. The law requires two reports to be completed on a recurring basis, the first report is due July 1, 2016 and every subsequent six months identifying any Practical Design savings, retired risk and unused contingencies. The second report is required annually with the budget submittal and includes the savings mentioned above plus the addition of savings generated through scope changes and associated impacts on risk and changes in the cost of materials.

A semi-annual report is due each July 1 and January 1 providing information on Practical Design savings, unused risk reserves, unused contingency, and identification of savings for the State Treasurer to transfer from the Connecting Washington account to the Transportation Futures Funding Program account. If no savings are identified to be transferred at the time of reporting, an estimated date of savings materializing is provided. The specific language for the semi-annual report is as follows:

RCW 47.01.480 (2)(b) - Beginning July 1, 2016, the department must submit a report to the state treasurer and the transportation committees of the legislature once every six months identifying the amount of savings attributable to the application of Practical Design, retired risk, and unused contingency funding, and report when the savings become available. The state treasurer must transfer the available amounts identified in the report to the transportation future funding program account created in RCW 46.68.396.

Furthermore, the law outlines the basic methodology associated with how the Practical Design savings element of the report should be calculated. The following is an excerpt on from the law:

RCW 47.01.480 (1)(c) - To determine the savings attributable to Practical Design, each connecting Washington project must be evaluated. For design-bid-build projects, the evaluation must occur at the end of the project design phase. For design-build projects, the evaluation must occur at the completion of thirty percent design ...

Given the above direction, it is important to recognize that the reporting requirements associated with this semi-annual report include elements which are to be reported at the completion of the project design phase (savings attributable to Practical Design), and project construction (retired risk and unused contingency funding). Since WSDOT often delivers legislative line-item projects using multiple construction contracts, the final reporting element (savings available to transfer) would not be available until the last construction contract to deliver the legislative line-item project has been completed.

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The semi-annual report includes Connecting Washington line-item projects in the Highway Construction Improvement program, Washington State Ferries Capital program, Rail Capital program, Facility Capital program and Local Programs Capital program as reflected on the latest legislative project list once design is completed.

Programmatic entries such as the Highway System Preservation line item, the ferry vessel and terminal preservation line item, grant programs for bicycle/pedestrian, and transit and rail projects are assumed to be fixed levels of investment intended to deliver as much of the identified work as possible over the 16 year period. Therefore, programmatic entries will not be reported on as part of this semi-annual report.

Additionally, WSDOT believes that to capture the savings attributable to Practical Design the impact of inflation should be removed from the calculation. The detailed information in these reports will capture Practical Design savings based on a constant dollar comparison between the original (uninflated) legislative project budget and the (uninflated) project estimate at the time of advertisement for changes attributed to Practical Design decisions in order to capture the WSDOT driven engineering decisions made during project design.

Furthermore, WSDOT assumes that the issuance of the Request for Proposal (RFP) represents completion of 30% design for calculating the savings attributable to Practical Design on design-build projects.

Additional assumptions associated with the semi-annual reporting include:

- Projects that have already been designed using non-CW funding and have only construction funded through CW will not have any Practical Design savings reported, but will reflect the other required reporting elements.
- Projects where CW does not fully complete the design of a project (including all CW funded planning studies) will not be included in the report detail reported until the time comes that funding for design is provided and completed for the project to be advertisement ready. Other required reporting elements will not be reported on until construction funding becomes available.
- Local projects will be “self-reported” by the local jurisdiction to Local Programs.

IMPLEMENTING PRACTICAL SOLUTIONS THROUGHOUT WSDOT

Practical solutions strategies are applied throughout the project development and delivery process. Depending on where in the process the Practical Solution refinements are identified will determine whether the savings are cost avoidance (i.e. an initial lower project estimate to be funded than otherwise anticipated) or a reduction to a project budget (i.e. project savings which occurred after the initial project estimate was funded).

Practical design applications begin during the scoping and pre-design stage of project development. During this stage, agency pre-design efforts are funded from non-project resources rather than from a specific project budget. Practical design savings through cost avoidance are removed from the project estimate prior to establishing the initial project budget. After the initial project budget is established and design begins on that project, Practical Design results in reduced costs to deliver the project. Assuming no inflationary increases on the project over its delivery schedule, the reduced delivery cost will manifest itself as project savings. It is important to recognize that greater savings are often

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generated through Practical Solution and Practical Design efforts during the earlier stages of project development, prior to the project receiving funding. This concept has been documented, in part, in the 2010 JLARC report on WSDOT scoping and cost estimating for highway construction projects. As WSDOT continues to refine its approach to implementing Practical Solution and Practical Design, we believe that more savings will be accounted for prior to a project's initial funding than after it becomes funded. This will result in fewer savings being available over time from funded projects.

KEEP PROGRESS MOVING FORWARD

The Practical Solutions approach will continue to evolve as WSDOT works with our partners, communities, citizens and businesses to find ways to bring low cost, effective solutions to keep transportation vital for generations to come. WSDOT has implemented supporting policies and training for our workforce and is using new tools to keep our existing assets in good condition. New technology and innovations continue to be used to operate highways, rail and ferries, giving more options for safe and reliable travel. More savings will be realized in the delivery of the projects outlined in the Connecting Washington legislation, which will result in more funds available to address unmet needs. This generation's era of transportation management is lean and empowered to find better, faster and cheaper solutions than ever before.

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