CONSTRUCTION PROGRAM BUSINESS PLAN

APPENDIX

October 2017

Washington State
Department of Transportation

APPENDIX

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APPENDIX A

REVIEW OF WASHINGTON STATE DEPARTMENT OF TRANSPORTATION'S IMPLEMENTATION OF DESIGN-BUILD PROJECT DELIVERY - FINAL REPORT

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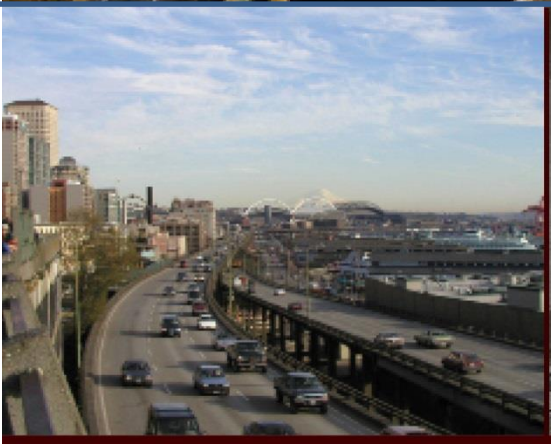

State of Washington | Joint Transportation Committee

FINAL REPORT

Review of WSDOT's Implementation of Design-Build Project Delivery

December 15, 2016

Review of Washington State Department of Transportation's Implementation of Design-Build Project Delivery

FINAL REPORT

Prepared for:
State of Washington
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December 15, 2016

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EXECUTIVE SUMMARY

Engagement Overview

The Joint Transportation Committee (JTC) of the Washington State Legislature engaged a team led by Hill International Inc. to study the Washington State Department of Transportation's (WSDOT) use of the design-build (DB) project delivery method. The primary objective of the study was to identify potential changes in law, practice, organizational structure, or policy that will allow WSDOT to optimally employ DB delivery to maximize efficiencies in cost and schedule.

The primary tasks to accomplish this study are summarized as follows:

- Provide a basic overview of DB, including the benefits and challenges of DB compared to traditional Design-Bid-Build (DBB) delivery.
- Examine WSDOT's current use of DB project delivery for a representative cross-section of DB projects.
- Compare WSDOT's DB program with transportation industry best practices with the objective of identifying:
  - What WSDOT is doing well (i.e., is in alignment with industry best-practices),
  - How WSDOT has improved its program over time, and
  - What gaps exist in WSDOT's DB program that could be improved.
- Propose potential recommendations for improvements to the program to maximize cost and schedule efficiencies.
- Propose next steps and strategies for WSDOT to effectively implement these recommendations.

To accomplish these tasks, the consultant team worked closely with a six member DB review panel convened for this study, the JTC staff, and a Staff Work Group consisting of members of the JTC, staff from the House and Senate Transportation Committees, and staff from the Office of Financial Management.

The consultant team interviewed the chairs and ranking members of the House and Senate Transportation Committees at the outset of the study, and provided three briefings to the House and Senate Transportation Committees on the findings and progress of the work, which was conducted over a 12-month period commencing in October 2015.

DB Review Panel

Michael Loulakis, DBIA, CPS, Inc.
Gregory Henk, Henk Associates
Bob Adams, AGC of WA
John Ferguson, ACEC of WA
Vince Oliveri, Professional & Technical Employees Local 17
Linea Laird, WSDOT Chief Engineer, Assistant WSDOT Secretary

Staff Work Group

Mary Fleckenstein, JTC project manager
Beth Redfield, JTC
Alyssa Ball, House Transportation Committee
David Munnecke, House Transportation Committee
Kim Johnson, Senate Transportation Committee
Brian Connell, Senate Transportation Committee
Jay Balasbas, OFM
Dana Quam, House Republican Caucus
Jackson Maynard, Senate Majority Coalition Caucus
Debbie Driver, House Democratic Caucus

WSDOT Staff

Chris Christopher, State Construction Engineer
Craig McDaniel, Deputy State Construction Engineer
***Scotty Ireland,** Assistant State Construction Engineer
***Teresa Eckard,** State Design-Build Engineer
Jay Alexander, Capital Program Development and Management

* Scotty and Teresa left WSDOT before the completion of the study

Oversight and Direction

The study was guided by the JTC staff, and a six-member DB Review Panel that consisted of three representatives from local industry, the Associated General Contractors (AGC) of Washington, the American Council of Engineering Companies (ACEC) Washington, and the Professional & Technical Employees Local 17. The WSDOT panel representative was the WSDOT Chief Engineer and Assistant Secretary for Engineering and Regional Operation. The consultant team provided two national DB experts, one with extensive owner advisory experience and affiliation with DBIA, and the other with extensive DB industry expertise and perspectives.

Both the JTC staff and WSDOT staff were extremely cooperative throughout the study, providing input, feedback, and perspectives to the consultant team. However, the recommendations in this report are based on the consultant team's independent analysis of the study findings and results.

Summary of Findings

DB is contracting method where a single entity is responsible for both the design and construction of a project. This integration of design and construction services under one contract supports earlier cost and schedule certainty, closer coordination of design and construction, and a delivery process that allows for construction to proceed before completion of the final design. The use of DB has grown steadily since it was first introduced in the transportation sector more than 25 years ago. The nature of owner and industry questions have changed from why it should be used to how to accomplish it in the right way.

Analysis Approach

The study consisted of the following integrated tasks:

1. **Basic overview of DB:** The first step in the study was to provide a basic overview of DB project delivery including the benefits and challenges of DB compared to traditional DBB project delivery. This overview was used to evaluate the perceived benefits and challenges associated with WSDOT's DB program. The Task 1 White Paper included on the attached CD provides additional details regarding this review.

2. **Peer Review - Identify and evaluate industry best practices in DB delivery:** Step two of the study involved identifying and evaluating other states' DB programs, as well as reviewing best practices as determined by the nationally respected Design-Build Institute of America (DBIA). Twelve departments of transportation (DOT) with active DB programs as well as selected private sector DB practitioners (consultants and contractors) were interviewed. DOTs were selected based on the maturity of their DB programs, geographical location, range of projects, and differences in legislation and DB implementation strategies. The interviews focused on key topics of interest for DB project delivery including:

    - Program Delivery
    - Organizational Structure, Staffing, and Training
    - Project Development
    - Delivery Method Selection
    - Procurement
    - Risk Allocation
    - Project Execution

    The findings from the DOT interviews were further compared with DBIA best practices for each of the key topics of interest. The detailed findings can be found in the Task 2 White Paper included on the attached CD.

3. **Evaluate WSDOT's current use of DB:** The next step in the study was to evaluate WSDOT's current use of DB. A representative sample of six of WSDOT's 29 DB projects representing large and small project categories (i.e. RCWs 47.20.780 and 47.20.785) were analyzed to understand WSDOT's current implementation of DB project delivery. WSDOT project staff were interviewed for each project. In addition

to feedback on the key topics of interest noted above, performance data and project facts and outcomes were collected to assess the extent to which the intended benefits of DB were realized. The Task 3 White Paper provided on the attached CD contains detailed findings and interviews regarding WSDOT's DB program.

4. **Gap Analysis:** Step four was to conduct a gap analysis to determine where WSDOT varied from current best practice. The national best practices were then compared with the data collected from WSDOT DB projects to assess:

    - What does WSDOT currently do well or in alignment with leading industry DB practices?
    - How has WSDOT improved its DB practices over time?
    - What aspects of WSDOT's DB program could be improved?

5. **Recommendations:** Step five was to develop proposed recommendations based on the results of the gap analysis.

6. **Implementation:** The final step in the study was to propose strategies to adopt the recommendations and to identify the next steps that WSDOT needs to take to adopt the recommendations.

What does WSDOT Currently Do Well?

The study showed that there are many things WSDOT currently does well when implementing DB. These are described below.

- **Industry outreach.** It is generally recognized that for DB to work well, a mutual level of trust and respect must be established between the owner and industry groups. To this end, WSDOT regularly engages industry and has effectively fostered a collaborative working relationship based on mutual trust and respect as it continues to develop and refine its DB program.

- **Commitment of senior leadership.** WSDOT's senior leadership is committed to the success of its DB program. Dedicated staff have been assigned at the Headquarters level to support the development and coordination of the DB program and to act as overall champions of the use of DB. Adequate resources (either internal WSDOT staff or external consultants working on behalf of WSDOT) are generally now allocated to the project teams responsible for managing DB projects.

- **Risk allocation.** WSDOT collaborated with industry to develop a risk allocation matrix that allocates risks commonly encountered on highway construction projects to either WSDOT or the design-builder. This matrix is typically used as a starting point, and then the risk allocation is adjusted for each project based on project-specific risks. WSDOT's risk allocation matrix reflects a best practice risk sharing philosophy where WSDOT takes responsibility for project risks that are not reasonably under the control of the design-builder, and transfers risks to the design-builder that industry can more effectively manage.

- **Shortlisting.** WSDOT routinely shortlists the number of proposers invited to submit a Phase 2 technical proposal. This practice ensures that one of the most highly qualified teams will be awarded the DB contract, and is consistent with DBIA best practices. Creating a shortlist has the added benefits of making the process of evaluating the technical and cost proposals more manageable (such as administering the one-on-one meetings discussed below), and enabling WSDOT to focus its efforts on determining which of the most highly qualified proposers offers the best value (i.e. combination of price and technical solutions).

- **One-on-one meetings.** WSDOT conducts one-on-one meetings with proposers during procurement. This practice is strongly supported by DBIA and used by many DOTs. One-on-one meetings are confidential meetings held during the procurement process between proposing DB teams and DOT staff. Such meetings serve as a key communication tool to encourage the open and candid exchange of concepts, concerns, and

ideas and to help ensure that WSDOT's project needs are being appropriately and consistently interpreted by all proposers.

- **Stipends.** To encourage competition and motivate the industry to innovate, WSDOT offers reasonable stipends, consistent with industry best practice, that compensate shortlisted proposers who have submitted responsive technical proposals.

- **Alternative Technical Concepts (ATCs).** To further promote innovation, WSDOT routinely encourages proposers to submit ATCs. The ATC process is viewed by DBIA and the transportation industry as an effective tool for giving industry the opportunity to suggest new ideas, innovations, or concepts that may not have been directly reflected in the solicitation documents.

How has WSDOT's delivery improved over time?

WSDOT has been using DB for 16 years. Over time, WSDOT has learned from its experience and has improved DB project delivery in a number of ways, as described below.

- **Procedural guidance.** WSDOT recently established an internal DB Work Group composed of WSDOT DB practitioners to provide ongoing support for the development of an updated DB Manual. The manual is intended to provide guidance for all aspects of DB delivery, including project development, procurement, and contract execution and administration.

- **DB template documents.** WSDOT has been working closely with the construction and design industry to develop DB template documents. This includes the Association of General Contractors' Subcommittee for DB and the American Council of Engineering Companies (designers) representation to review standard contract language and update template documents. From a DOT's perspective, standard template documents help streamline the effort needed to develop and review solicitation and contract documents for specific projects, while also ensuring that roles and responsibilities related to design, quality, third-party coordination, and similar requirements that may change under DB are clearly and adequately defined. From industry's perspective, the familiarity and comfort level afforded by an owner's repeated use of standardized documents can facilitate their bidding processes and lead to better proposals.

- **Implementation of Project Delivery Method Selection Guidance (PDMSG).** DB is not appropriate for all projects. WSDOT has developed a PDMSG that provides a robust and scalable process for evaluating different delivery methods against a project's goals, constraints, and risks. Using such a structured approach lends transparency and consistency to the decision process and helps ensure the appropriate application of DB. WSDOT's PDMSG reflects a best practice for project delivery method selection tools.

- **Use of DB on small projects.** WSDOT has piloted the use of DB to smaller projects to test its effectiveness as a delivery method for smaller projects, and help grow the DB industry by expanding opportunities for smaller firms to prime projects.

- **DB experience.** Although DB expertise is not widely dispersed across WSDOT staff, a strong knowledge base of experience and lessons learned now exists among the project team members working in the Puget Sound area. WSDOT is tapping this knowledge base to provide an effective starting point for the development of a robust training program designed to transfer and instill DB knowledge to others within WSDOT.

What aspects of WSDOT's DB program could be improved?

Based on a comparison of current WSDOT DB practices with leading industry practices, the following aspects of the WSDOT program could be improved.

- **Standardization of DB processes.** WSDOT's DB practices (particularly those related to post-award contract administration) are largely improvised and are inconsistently applied by project team members or between WSDOT offices. To address this gap, WSDOT is currently working on the development of a standard DB guidance manual to more formally define its DB processes.

  To ensure the manual will serve the intended purpose and further promote consistency in DB contract administration, WSDOT must also devise an effective strategy for implementing the policy, guidance, and best practices contained therein (i.e., holding the project teams accountable).

  Developing and implementing a more comprehensive set of DB policies and procedures aligned with leading practices, coupled with a robust staff training program in these best practices, should help WSDOT foster a more sustainable and effective DB program.

- **Distribution of DB expertise.** DB expertise is not widely distributed across WSDOT staff. Staff experience is primarily concentrated in the Puget Sound (Northwest and Olympic Regions), where most of the DB projects have been located. However, even within these regions, most staff outside of the DB teams have limited DB knowledge or experience.

- **Training.** WSDOT currently lacks a formalized DB training program. Training efforts are largely ad hoc, with most staff learning on the job through the mentoring efforts of experienced Project Managers. To broaden the application of DB, particularly to other areas of the state, statewide training is needed to promote consistency.

- **Reliance on consultants.** A common complaint regarding WSDOT's DB program voiced by industry representatives was that WSDOT often allocated too much authority to its consultant resources, particularly for design reviews. The issue stems in part from the perception that the consultants, who are paid by the hour, are incentivized to be unnecessarily critical of design-builder submissions.

  With the new Connecting Washington funding, WSDOT is mandated to create a sustainable core workforce. The increase in the program size with the new legislation will also necessitate supplementing WSDOT's core staff with consultants to deliver projects within the program. When using consultants, WSDOT staff should maintain control and responsibility for design reviews and decision-making, and use consultant staff in a supporting role.

- **Flexibility in procurement and delivery options.** WSDOT currently procures DB services using a two-step best-value approach. Several of the DOTs with more mature DB programs have the ability to implement DB in different ways based on project types or characteristics. If WSDOT continues to expand the use of DB to smaller, less complex projects, more streamlined DB procurement options, including a single-step process, low bid DB, and bundling of multiple projects, may help achieve greater efficiencies in project development and procurement. Smaller projects would also benefit from the use of pass-fail criteria and an expanded shortlist.

- **Evaluation criteria.** The evaluation criteria and associated weightings used by WSDOT to select the design-builder have not always provided for clear distinctions aside from cost. Higher weightings are generally allocated to price (i.e. 90% price/10% technical) than noted for similar DB programs. WSDOT could improve their proposal evaluation criteria in two ways. First, while DB projects typically require and encourage contractor innovation, the criteria WSDOT uses to evaluate proposals is heavily weighted toward price (90/10). This undervalues the very innovation needed in a DB project. Increasing the weighting towards non-price factors may result in an award to a higher priced proposer, but the value received may result in greater innovation, improved performance, and a higher quality end product. Second, WSDOT should evaluate the cohesion and working relationships of the various members of the proposed DB teams as part of their proposal evaluation. One approach would be to evaluate whether team members have successfully worked together on similar projects as part of a qualifications criterion. These relationships were a problem on some WSDOT DB projects.

- **Consistent, objective evaluation of proposals.** WSDOT does not appear to have standard guidance or training on the evaluation process, which could allow favoritism to influence selection results. WSDOT should include guidance in the DB Manual to address proper evaluation procedures, develop project-specific evaluation plans, and train evaluators on the importance of impartial selections.

- **Preliminary design and project development.** There are some opportunities for improvement in WSDOT's preliminary design and project development activities. Inappropriate delivery method selection or project scoping definition issues for some DB projects, particularly in the early stages of WSDOT's program, may have prevented WSDOT from achieving some of the desired benefits of DB, such as contractor innovation and cost and time savings.

  - Although DB best practices suggest that preliminary design work for DB should not be advanced too far by the owner, for some WSDOT DB projects additional front-end tasks were needed to adequately define the scope (e.g., geotechnical/environmental investigations, and third party coordination). These front end activities must still be performed by WSDOT to ensure the development of a realistic understanding of the project's scope and budget and to provide proposers with information that they can reasonably rely upon in establishing their price.

  - The use of performance specifications rather than prescriptive requirements is generally viewed as a best practice for DB delivery to provide the greatest opportunity for contractor flexibility and innovation. WSDOT instead relies on prescriptive standards in its DB templates and uses a resource intensive ATC process to achieve the same goal. The current DB templates (Book 2) addressing technical requirements generally cite mandatory prescriptive standards (i.e. design, materials, construction manuals, standard specifications) for various design elements. If WSDOT intends to allow the design-builder more flexibility through the use of performance specifications, which also may require exceptions to standard practices, it will need to articulate specific areas or elements of the work where the design-builder may consider alternative solutions or options. These alternatives may entail design exceptions or identifying where there may be flexibility in the current WSDOT standards that would satisfy the contract requirements. Performance specifications are not appropriate for all applications (i.e. where elements must match existing infrastructure, or where alternatives may have lifecycle maintenance implications), and WSDOT would need to provide guidance for when to use or not to use performance specifications.

  - WSDOT currently lacks a strategy for integrating Practical Design into project scoping and procurement activities for a DB project.

- **Contract administration.** WSDOT currently lacks any formal guidance related to owner monitoring, supervision, and oversight during project execution – a key area affecting DB project success. The design phase in particular is challenging some WSDOT designers who are having difficulty understanding their role in the final design process.

- **Lessons-learned.** WSDOT uses a Construction Contract Information System (CCIS) to track certain project metrics, and uses a Construction Audit Tracking System (CATs) to track non-conformances among other data; however, the information collected in these systems is not used or analyzed to assess DB performance, or capture lessons-learned in a manner that could be used to inform future project development activities.

Recommendations and Strategies to Adopt

Based on our findings throughout the study, we have proposed the following recommendations to improve WSDOT's use of DB, and some strategies WSDOT can use to adopt them.

Table 1: Recommendations and Implementation Strategies

Recommendations	Strategies to Adopt
(1) DB Program Development and Management	
A. Develop and/or update WSDOT's standard DB procurement and contract forms.	The contract document templates are approximately 80% complete. After completing these templates in the short-term, ensure the DB Manual is consistent with the templates. In the longer term, this process should include making the templates scalable to various project sizes or procurement approaches.
B. Complete the updated DB manual, and ensure that the manual reflects the policies and procedures needed to promote the consistent and effective use of DB.	Assign a senior engineer from WSDOT to complete this manual and develop an implementation schedule committed to by all key DB personnel within WSDOT. Develop an internal and external rollout strategy for the programmatic documents that will accomplish the goals of educating WSDOT and its industry partners about WSDOT's DB policies, procedures and philosophies. This may entail a series of meetings/workshops with industry and WSDOT personnel where the topics for the manual will be discussed and policies finalized. Possible subjects include project development, project selection and scoping, front-end investigations, risk assessment, procurement, design development, QA/QC, and the use of performance specifications. An appropriate target for the completion of these materials is 9-12 months.
C. Develop an internal and external rollout strategy for programmatic documents to educate and obtain buy-in from WSDOT staff and its industry partners.	The internal rollout of the manual can be accomplished through the training program discussed under item 2.B below. An external rollout can be accomplished through industry meetings and by having the programmatic documents published online.
D. Maintain and update the contract document templates and DB manual as additional recommended policies or procurement strategies are adopted.	Assign HQ DB staff responsibility for maintaining and updating the DB documents as additional policies and procedures are developed.
E. Establish a database of DB lessons-learned.	Continue to develop a lessons-learned database for DB and all other forms of project delivery. This effort could include the creation of post-construction project report cards to evaluate the extent the project met stated performance goals, including feedback from the DOT staff and the DB industry team.

Recommendations	Strategies to Adopt
(2) Staffing and Training	
A. Increase dedicated full-time DB staff in the near term to support: 1. A statewide DB training program 2. Completion of procurement and contract forms 3. DB manual development (currently at 5%) 4. Procurement support 5. Project-level technical support 6. Public and industry outreach 7. Lessons-learned / performance database	At the time of this study, the dedicated DB staff at HQ was 1-1/2 full time equivalents (FTE). WSDOT has subsequently committed to increase HQ staff from 1-1/2 to 2-1/2 FTEs. Supplement HQ staff with consultant resources if needed to develop statewide DB training materials and DB manual in the intermediate term (approximately 12 months). As part of a longer-term implementation strategy, use HQ and regional staff to present DB training to all regions. After the updated DB manual and training program is rolled out, reevaluate staffing levels at HQ and adjust based on needs of the Regions.
B. Develop and conduct formalized training to more widely disperse the skills (and increase the number) of DB Project Managers (PM) in Regions outside of Puget Sound area (e.g. Eastern, Southwest, North and South Central).	Knowledge transfer and skill enhancement can be achieved through training and peer-to-peer exchanges: *Training:* Develop training materials and conduct training of WSDOT staff in DB fundamentals, with modules for project development (scoping), procurement, contract development, and project execution including design reviews, field quality procedures, responses to requests for information/clarification, change management, payment, and documentation requirements among other specialty topics. *Peer-to-peer exchanges:* Continue to conduct peer-to-peer exchanges between experienced DB PMs and potential PMs from regions with no DB experience to share lessons-learned and DB management best practices. This can be done as part of training programs adapted to working professionals, for example a "lunch-and-learn" seminar or DB training in preparation for a specific project. In addition, consider exchanges with other states/agencies with DB experience, or attendance at DBIA, FHWA, or AASHTO DB forums. This may entail out-of-state travel as an additional training expense.
C. Supplement HQ DB staff with additional HQ or Regional technical staff (i.e. bridge, roadway, geotechnical, environmental, etc.) to serve as subject matter experts (SME) trained in DB development and execution.	Identify technical staff candidates in the relevant technical disciplines. Provide specialized DB training to technical staff candidates to address DB for specific technical topics (i.e. environmental, geotechnical, structural, roadway, utilities). These may include scoping, use of performance criteria/requirements, evaluation criteria, ATCs, and design reviews.

Recommendations	Strategies to Adopt
D. Because excellent WSDOT DB staff are often hired away by local industry, WSDOT should make an effort to keep their well-trained DB staff on the WSDOT payroll. They can do this by offering DB credentials and experience and a more competitive compensation structure as part of an overall career development/retention plan.	WSDOT should recognize those employees who are gaining DB experience and ensure that there is a formal career development process in place that not only has such employees gaining on-the-job experience, but also receiving continuing education that will enhance their careers. These individuals could become active in national or local DB activities and be encouraged to take leadership roles. Aside from training, WSDOT should ensure, to the best it is able, that experience and talent is being recognized and compensation is in line with other local public agencies. Use the 2016 WSDOT Recruitment and Retention study results to update the overall compensation structure and determine the value of DB credentials and experience.
E. Optimize the use of consultants: • Use consultant staff for strategic programmatic support of HQ DB staff. • Use experienced DB consultant staff to in a supporting role to supplement DOT project staff for day-to-day execution of larger DB projects or projects requiring special expertise.	Use consultant support and expertise as necessary to assist with development of training materials and DB manual. After the decision is made to use DB for a larger project, assess project staffing requirements and augment DOT staff with experienced consultant staff to support project execution phase (i.e. design reviews, construction inspection, responses to RFIs, quality management, etc.).
(3) Project Development	
A. Take advantage of Practical Design in the scoping/preliminary design phase for DB through adjustments to scope that do not compromise functionality or quality.	Practical Design (PD) encourages design flexibility to find lower cost design solutions that meet the project purpose and need. Chapter 110 of WSDOT's Design Manual, "Design-Build Projects," states that under Practical Design (PD), design flexibility is encouraged to develop designs tailored to performance needs. WSDOT is currently piloting a Practical Design process that occurs after contract award. Under this process, a Practical Design Review (PDR) will occur within seven days of Contract execution and before Notice to Proceed (NTP). This PDR is also referred to as the "Practical Pause." WSDOT should also pilot a plan to evaluate PD concepts as part of the scoping and procurement phases of DB projects. By implementing during project development and procurement, WSDOT will gain maximum advantage of PD where the DOT can consider design flexibility in the DB Request for Proposal to meet performance criteria and promote cost effective solutions. In place of the current language in RCW 47.01.480 (1) (c) (House Bill 2012, 2015 session) addressing Practical Design that states "For Design-Build projects, the evaluation must occur at the completion of thirty percent design," allow for PD to occur at any stage of project development.

Recommendations	Strategies to Adopt
B. Consider market conditions and availability of DOT resources when determining the scope and size of contract packages.	In the updated DB Manual and training materials, highlight the importance of considering contract packaging from cost, schedule, community impact, DB market, and other perspectives. For large projects or programs, conduct outreach sessions to gauge industry interest and capabilities, with the understanding that smaller DB projects may stimulate more competition from local industry. In expanding the DB program, ensure a healthy mix of projects (both size and type) to create opportunities for firms to gain experience with DB, potentially leading to increased competition on larger projects.
C. Make informed and conscious decisions regarding the use of performance versus prescriptive specifications during project development.	When appropriate, use performance criteria/specifications for projects or project elements to allow bidders to work with less-than-complete designs to develop bid packages that both meet the needs of WSDOT and benefit from innovation and creativity. Provide guidance in DB Manual and formalized training on: • When to use or not to use performance criteria, • How to coordinate performance specifications with standard design manuals, and • Best practices for performance specifying.
D. Perform appropriate levels of front-end investigation and design (i.e. scoping definition), consistent with project goals, risk allocation, and procurement approach.	Ensure that the risk management process (CRA/CEVP) considers the potential for more work to be done before starting the procurement process, and the extent of front-end investigations. Using the results of a risk assessment, set the internal budget and schedule to allow for a level of front-end subsurface, utility, or other investigation of the site required to accurately define the required scope of work for a DB project. The higher the risk rating, the more resources should be applied to front-end investigation and vice versa.

Recommendations	Strategies to Adopt
(4) Delivery Method Selection	
A. Experiment with alternative DB delivery strategies that improve the efficiency of delivery for high risk, complex projects and smaller projects. Alternative DB strategies for high risk or complex projects may include progressive DB. Alternative DB strategies for smaller projects could include bundling or multiple award task order contracts. Bundling small projects (e.g. small bridge rehabilitation, fish passages) under a single DB contract can accelerate delivery and achieve efficiencies in accelerated procurement, design, environmental permitting, construction sequencing, and overall time savings.	Use an objective consistent process with established criteria to determine the most appropriate delivery method. The PDSMG selection process should be refined as needed address alternative DB delivery strategies. For example, adapt the PDSMG to address the DB delivery options available for procuring high risk, complex projects where scope definition and early price certainty are difficult to achieve. Similarly, develop options for smaller DB projects, including a specific set of procurement procedures. Continue to use pilot programs as an approach to test and validate the use of alternative DB delivery strategies. Potential applications for bundled DB projects would be for statewide small or low impact bridge rehabilitation/replacements, selected fish passage culverts in close proximity, or for projects located near each other where efficiency can be gained by one contractor mobilization for multiple projects. Implementation of these options, for example a one-step responsive low bid process, may require revisions to current Washington DB legislation. Alternatively, WSDOT can use the current price less technical credits best-value process for bundled low impact bridges.
B. Refine PDMSG and manuals as appropriate based on lessons learned and systematic comparisons of the results of using the various project delivery strategies -- DB, Bid-Build and GC/CM.	As a project closeout activity in conjunction with identifying lessons learned, the project team should evaluate if the chosen delivery method using the PDMSG was appropriate. One approach could be to re-score the PDMSG matrix and compare with the original PDMSG matrix. Use the feedback in the long-term to assess whether PDMSG, contract templates, or DB Manual needs refinement. Another strategy would be to develop a DB project performance tracking database considering cost growth (i.e. Engineers Estimate to Award Cost, and Award to Final Costs). Compare DB with similar DBB projects (and GC/CM projects) considering project scope and cost. Additional performance metrics to be considered could include timing of award, overall project duration, construction duration, project intensity, change order impacts (by category), and non-conformances. Use the database in the long-term to assess whether PDMSG or DB Manual needs refinement.

Recommendations	Strategies to Adopt
(5) Procurement	
A. Streamline the procurement process for smaller, less complex projects (e.g., one-step procurement process with selection based on low bid or best-value).	Modify procurement process [e.g. Procurement documents for DB] to reflect a shorter one-step process or an accelerated two-step process. WSDOT's DB Manual outline currently has a description of a one-step process. DOTs typically create separate contract templates for a one-step, or qualified low bid process [see FDOT Low Bid template, or CDOT Streamlined DB]. A one-step process eliminates the Request for Qualifications (RFQ) and shortlisting step; it may also forgo the use of ATCs and stipends unless beneficial to include during the ad period. The ad period would be similar to that for a bid-build process – 6-10 weeks. Typically a one-step process requires the submission of separate sealed technical and price proposals. Selection is based on the lowest price for proposers that meet responsiveness requirements. The responsiveness check may include a pass/fail or scored criteria including qualifications, experience, and technical ability. If using a two-step process, consider expanding the short list (e.g. 4) to allow for more competition.
B. Refine evaluation criteria for the two-step best-value process. 1. For high risk or challenging projects, include technical criteria (i.e. geotechnical, utilities, design features) with higher weightings for technical factors (i.e. 75% price/25% technical) based on the prioritization of project goals and risks. 2. Use prior working relationships of DB teaming partners as a qualifications criterion for selected high risk projects where coordination is a key criterion. 3. For projects using a two-step process: a. Expand the short list where selection is primarily based on price. b. Consider pass/fail for key personnel qualifications (to meet a minimum standard), or add project understanding and approach criteria to allow proposers with less experience to compete.	As an added refinement to the Instructions to Proposers (ITP) template, decide what the final set of procurement policies are through workshops or other forums with senior staff and industry partners. Based on this dialog, develop guidance in the DB manual to identify and weight key evaluation criteria that align with project goals and risks, and provide differentiation among proposers. Use the PDMSG as a guide for defining project goals and risks. For larger projects, conduct separate procurement assessments to identify evaluation and selection criteria and weightings based on prioritization of goals and risks. Eliminate apparent duplication in the current ITP template (i.e. Quality: 3.3.7.2 and 3.3.13, Impacts: 3.3.8 and 3.3.17). Adjust the Request for Qualifications (RFQ) template for smaller projects. Consider using pass/fail (P/F) or lower thresholds for experience and past performance, use point scoring as defined in the RFQ template for understanding and approach criterion, and expand the shortlist where selection is primarily based on price and the proposal effort is limited.

Recommendations	Strategies to Adopt
C. Optimize the efficiency of the Alternative Technical Concept (ATC) process and one-on-one meetings. 1. Account for the significant effort associated with conducting these meetings when planning procurement staffing needs and determining the number of firms to shortlist. 2. Keep WSDOT participating staff small; require the contractor to develop an agenda for one-on-one meetings that includes a list of WSDOT staff needed to discuss/evaluate ATCs; and limit consultant support to ensure the strictest confidentiality.	Address protocols for one-on-one meetings and set them forth in the DB Manual. Some DOTs prohibit members of the project proposal evaluation team from participating in proprietary ATC meetings, citing the need to prevent the appearance of bias or a conflict of interest. Non-disclosure agreements or restrictions on DOT or consultant personnel participation will promote sharing innovative ideas and increase the number and quality of ATCs. The current WSDOT Instructions to Proposers (ITP) template addresses submittal and review of ATCs, and the DB Manual also provides guidance for the use of ATCs. Both documents address the concept of "equal or better" as the standard for acceptance of an ATC. The guidelines should also note that the solicitation documents should define areas where ATCs are allowed and where they are not allowed (i.e. some DOTs do not allow ATCs for pavement design, or impacts to third party agreements).
D. Establish a database of ATCs to: • Develop pre-approved elements or options for standard designs that will expedite the ATC approval process. • Promote or introduce more flexibility in current design standards to allow for greater use of performance specification.	Review existing ATCs for DB projects and develop a database of approved ATCs by category (i.e. materials, geometrics, bridge, traffic, walls, drainage, paving, geotechnical, etc.).
E. Ensure the objectivity of the proposal evaluation process.	Develop guidance and training to ensure proposal evaluators do not introduce bias or favoritism into the evaluation process. Possible techniques (particularly for large or high-profile projects) include: • Developing project-specific proposal evaluation plans; • "Blinding" technical proposals (i.e., concealing the identity of the proposers); • Having witnesses observe evaluation discussions and report out on any unfair or biased treatment of proposers; and • Providing adequate documentation to sufficiently support the ratings and scoring.

Recommendations	Strategies to Adopt
(6) Budgeting and Cost Estimating	
A. WSDOT should work with key legislators and legislative staff to more effectively appropriate funds for DB projects.	Engage in a discussion among WSDOT executives and the Office of Financial Management and legislative transportation leaders and legislative staff about improvements that could be made to how funds are appropriated for WSDOT DB projects. After the discussions, the proposed changes would be formalized as an official budget request, and legislative staff would present the proposed budget revisions to legislative members for final approval through the normal budget and legislative process.
B. Examine causes of higher Engineers Estimates (EE) and whether estimating process should be refined.	Based on a review of WSDOT DB projects awarded to date, WSDOT EEs for its DB projects are on average higher than the contract award values, and higher than EE to award values for DB projects at the national level. Examine whether the cause is due to market conditions, risk pricing or other reasons.
(7) Risk Allocation	
A. Use risk analysis results to inform project development and procurement activities.	Develop guidance, for inclusion in the DB Manual, regarding how to use the risk analysis results to assist with: • Project development (i.e., level of design development and front-end investigation) • Procurement (evaluation criteria) • Contractual risk allocation
B. Conduct periodic risk review meetings with the DB team to facilitate collaboration and help ensure project risks are effectively being managed to the benefit of the DB team, WSDOT, and the project as a whole.	Use the project risk register to regularly monitor, manage, communicate, and closeout risks throughout the duration of the project. The risk register can be used as a tool to guide periodic risk review meetings at which the following topics are discussed: • Effectiveness of risk mitigation measures • Additional risks that may have arisen • Previously identified risks that may be retired or closed out
(8) Project Execution	
A. Dedicate qualified key staff as needed to the full project life-cycle (design and construction phases).	At the outset of a project, consider likely resource needs, and commit key experienced and trained staff as necessary for the project duration.

Recommendations	Strategies to Adopt
B. Dedicate experienced staff with delegated authority to the design oversight function.	Empower project staff with decision-making authority over design reviews. Address effective practices for design administration and reviews for DB projects in the DB Manual and training program. Develop design review templates to assist staff with reviewing design submittals for contractual compliance.
C. Conduct project-specific training for large or complicated projects (e.g. projects >$100M or projects with complex geotechnical features, structures, or staging).	Provide project-specific training to the project team on contract administration, execution risks, or challenging procurements, etc. Procurement-related training should include specific training to facilitators, evaluators, technical support staff, and observers.
D. Optimize quality management for small DB projects.	Address effective practices for quality management of smaller DB projects in the DB Manual. This could entail the DOT reducing verification testing frequencies for low risk items or small quantities, taking back acceptance testing responsibility, or not using a third party firm to minimize duplication.

Implementation

Successful implementation of the recommendations identified in Table 1 requires careful planning to ensure that WSDOT's immediate needs are addressed first, followed by a properly sequenced and phased plan of longer-term measures.

For each recommendation, guidance is provided in Table 2 to help WSDOT determine how to best roll-out the recommendations, which have been prioritized within each general category based on the following considerations:

- The proper sequence in which recommendations should occur (for example, development and implementation of programmatic documents must be complete before more advanced training can occur);
- Implementation costs (based on an order-of-magnitude estimate of either one-time (O) or recurring (R) implementation costs);
- Implementation difficulty; and
- The beneficial impact of the recommendation.

The majority of the recommended actions are policy decisions under WSDOT's responsibility. Where legislative action may be required for budgetary or other statutory reasons, further review is needed to determine whether a legislative change is necessary. It is further noted that regardless of responsibility, some of the projected costs of implementation may require additional appropriations. WSDOT will need to develop internal estimates of the time and cost to implement these recommendations.

Table 2: Summary of Recommendations and Implementation Considerations

	Recommendation	Implementation					Benefits [3]
		Timing	Cost [1]		Difficulty	Status	
(1) DB Program Development & Management	A. Develop and/or update WSDOT's standard DB procurement and contract forms	1-6 months	<$100k	O	Low	Underway	❷ ❸
	B. Finalize and issue updated DB manual	6-18 months	$100 - $500k	O	Moderate	---	❷
	C. Develop and implement an internal and external rollout strategy for programmatic documents	6-18 months	<$100k	O	Low	---	❷ ❸
	D. Maintain and update the contract document templates and DB Manual as additional recommended policies or procurement policies or procurement strategies are adopted	> 18 months	<$100k	R	Low	---	❷ ❸
	E. Establish and maintain a database of DB lessons-learned	1-6 months	<$100k	R	Moderate	Underway	❶ ❷ ❸
(2) Staffing and Training	A. Increase DB Headquarters staff	1-6 months	$100 - $500k	O	Moderate	Underway	❶ ❷
	B. Develop and implement a formal DB training and mentoring program to increase DB skills and expertise across the Regions	> 18 months	$100 - $500k	R	High	Underway	❸ ❹ ❺ ❻
	C. Designate technical experts within DOT to support DB teams	6-18 months	<$100k	O	Low	Underway	❶ ❷
	D. Offer DB credentials and experience (rotation) and a more competitive compensation structure as part of career development/retention plan	> 18 months	> $500k	R	High	---	❸ ❹
	E. Optimize use of consultants	> 18 months	---	-- [2]	Low	---	❷ ❹

(1) Not all costs require a new appropriation or new funding. One-time $ = O, Recurring $ = R. WSDOT will need to determine which of these recommendations require additional funding, and which they can accomplish within their existing budgets.

(2) No cost policy change and/or cost savings

(3) See key of benefits below.

Benefits

❶ Reduce errors and conflicts
❷ Improve DB program consistency
❸ Improve efficiency of DB execution
❹ Increase and retain staff competency
❺ Accelerate project delivery
❻ Save project cost
❼ Reduce change orders/cost growth
❽ Enhance opportunities for innovation
❾ Increase competition
❿ Improved budgeting
⓫ Improve quality/evaluation of proposals
⓬ Improve communication & collaboration

	Recommendation	Implementation					Benefits [2]
		Timing	Cost [1]		Difficulty	Status	
(3) Project Development	A. Develop guidance to address Practical Design reviews for DB projects (including how process ties to preliminary engineering and procurement)	6-18 months	<$100k	O	Moderate	Underway	❻
	B. Consider market conditions and availability of DOT resources when determining the scope and size of contract packages	> 18 months	<$100k	R	Low	---	❼ ❾
	C. Develop and implement performance specifications	6-18 months	$100 - $500k	O	Moderate	---	❻ ❽
	D. Perform appropriate levels of front-end investigation	1-6 months	$100 - $500k	R	Low	---	❻ ❼
(4) Delivery Method Selection	A. Experiment with alternative DB delivery and procurement methods (e.g., bundling, low bid, single step)	> 18 months	$100 - $500k	O	Moderate	---	❸ ❺
	B. Refine PDMSG and manual as appropriate based on systematic comparisons of the results of using various project delivery strategies (e.g., DB, design-bid-build, and GC/CM)	> 18 months	$100 - $500k	O	High	---	❸

(1) Not all costs require a new appropriation or new funding. One-time $ = O, Recurring $ = R. WSDOT will need to determine which of these recommendations require additional funding, and which they can accomplish within their existing budgets.

(2) See key of benefits below.

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❾ Increase competition
❿ Improved budgeting
⓫ Improve quality/evaluation of proposals
⓬ Improve communication & collaboration

	Recommendation	Implementation					Benefits [3]
		Timing	Cost [1]		Difficulty	Status	
(5) Procurement	A. Streamline procurement process for small DB projects (e.g., expand shortlist, pass/fail qualifications criteria, or use an accelerated process)	> 18 months	<$100k	O	Moderate-High	---	❸ ❻ ❾
	B. Refine evaluation criteria to: – Assign greater weight to qualifications and technical evaluation criteria when seeking innovation – Address the prior working relationship of the DB team	> 18 months	<$100k	O	Low	---	❼ ⓫ ⓬
	C. Optimize the efficiency of the ATC process and one-on-one meetings	6-18 months	---	-- [2]	Low	---	❸
	D. Establish and maintain a database of ATCs, and use the data to: – Establish preapproved elements to expedite the ATC process – Identify opportunities to introduce more flexibility into current design standards	> 18 months	<$100k	R	Moderate	Underway	❷ ❸
	E. Ensure the objectivity of the proposal evaluation process	6-18 months	---	-- [2]	Low	---	⓫
(6) Budgeting & Cost Estimating	A. Work with legislative staff to more effectively appropriate funds for DB projects	1-6 months	<$100k	O	Moderate	---	❿
	B. Examine if Engineer Estimates are resulting in an over-allocation of funds and refine estimating process as necessary	1-6 months	<$100k	O	Moderate	---	❿

(1) Not all costs require a new appropriation or new funding. One-time $ = O, Recurring $ = R. WSDOT will need to determine which of these recommendations require additional funding, and which they can accomplish within their existing budgets.

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⓫ Improve quality/evaluation of proposals
⓬ Improve communication & collaboration

	Recommendation	Implementation					Benefits [2]
		Timing	Cost [1]		Difficulty	Status	
(7) Risk	A. Develop guidance, for inclusion in the DB Manual, regarding how to use the risk analysis results to assist with: – Project development (i.e., level of design development and front-end investigation) – Procurement (evaluation criteria) – Contractual risk allocation	6-18 months	<$100k	O	Moderate	---	7
(7) Risk	B. During the execution phase of a DB project, conduct periodic risk review meetings and regularly update the project risk register	6-18 months	<$100k	R	Low	---	12
(8) Project Execution	A. Dedicate staff as necessary to the full project-lifecycle (design and construction phases)	1-6 months	<$100k	O	Moderate	---	3 4 12
(8) Project Execution	B. Dedicate experienced staff with delegated authority to the design oversight function	6-18 months	$100 - $500k	O	Moderate	---	2 3 4
(8) Project Execution	C. Conduct project-specific workshops for larger or complex DB projects	6-18 months	<$100k	R	Moderate	---	2 3 4
(8) Project Execution	D. Optimize quality management for smaller projects	6-18 months	<$100k	O	Low	---	3 6

(1) Not all costs require a new appropriation or new funding. One-time $ = O, Recurring $ = R. WSDOT will need to determine which of these recommendations require additional funding, and which they can accomplish within their existing budgets.

(2) See key of benefits below.

Benefits

1. Reduce errors and conflicts
2. Improve DB program consistency
3. Improve efficiency of DB execution
4. Increase and retain staff competency
5. Accelerate project delivery
6. Save project cost
7. Reduce change orders/cost growth
8. Enhance opportunities for innovation
9. Increase competition
10. Improved budgeting
11. Improve quality/evaluation of proposals
12. Improve communication & collaboration

Implementation Timeline

Section 11.2 of the report presents a proposed timeline on page 99 for adopting certain recommendations. It is assumed that the policy-related recommendations under Contract Administration and Project Execution will be addressed in the DB Manual and training activities. The budgeting recommendation is a one-time programmatic policy decision that affects the current Connecting Washington program.

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The companion CD attached to the back of this report contains the following documents:

Task 1 White Paper: DB Overview

Task 2 White Paper: DB Best Practices Review
Attachment A – Interview Questionnaire
Attachment B – Interview Responses

Task 3 White Paper: Review of WSDOT's DB Program
Attachment A – WSDOT HQ Summary
Attachment B – Project Summaries
Attachment C – Industry Interviews

Task 4 Benchmarking Analysis of WSDOT's DB Program to Best Practice

Task 5 Recommendations and Preliminary Implementation Strategies

List of Recurring Abbreviations

ATC	Alternative Technical Concept
ASCE	Assistant State Construction Engineer
CEI	Construction Engineering & Inspection
CVEP	Cost Validation Estimating Process
DBIA	Design Build Institute of America
DOT	Department of Transportation
EE	Engineers Estimate
HQ	WSDOT Headquarters
PDMSG	Project Delivery Method Selection Guidance
RFQ	Request for Qualifications
RFP	Request for Proposals

PART 1

Introduction and Design-Build Overview

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Part 1 Objectives

- Identify the scope and objectives of the consultant team's engagement
- Define the basic characteristics of the DBB and DB delivery methods, and compare their advantages and disadvantages
- Provide an overview of WSDOT's DB program

1. Introduction

1.1 Scope of Engagement

The Joint Transportation Committee of the Washington State Legislature engaged a team led by Hill International to study the Washington State Department of Transportation's (WSDOT) use of the design-build (DB) project delivery method, with the objective of identifying potential changes in law, practice or policy that will allow WSDOT to optimally employ DB to maximize efficiencies in cost and schedule, and ensure that project risk is borne by the appropriate party.

Key tasks performed as part of this assessment included:

- Comparing the perceived advantages and disadvantages of DB with those of the traditional design-bid-build (DBB) project delivery method.
- Evaluating a representative sample of WSDOT's DB projects to determine the extent to which the perceived advantages of DB are being achieved.
- Identifying gaps / risks between WSDOT's current DB practices and leading industry practices to determine:
  - What WSDOT is doing well,
  - How WSDOT has improved its program over time, and
  - What additional improvements or enhancements could be made to further optimize WSDOT's DB program.
- Developing and prioritizing potential improvement recommendations and implementation strategies based on the resources required to implement the strategy and the potential benefits to be provided.

The observations and recommendations contained in this report were driven in part by our interviews with WSDOT representatives from Headquarters and each of the Regions, all of whom demonstrated a commendable level of cooperation and transparency, self-awareness, and desire for continuous improvement.

1.2 Overview of WSDOT's DB Program

Between 2000 and 2015, WSDOT expended approximately $11.6 billion on its capital program, of which $4.5 billion (or 38% of the total) was delivered using DB. DB projects thus make up a significant part of WSDOT's overall program in terms of dollars expended.

At the time of this study, WSDOT had applied DB on 29 projects, which have fallen within the following size ranges:

- > $300 M: 5 projects/programs
- $100 - $200M: 4 projects
- $50 - $100M: 4 projects
- $10 - $50M: 8 projects
- $2M - $10M: 8 projects (part of the small project pilot program)

The Task 1 White Paper provided on the companion CD, includes additional details regarding WSDOT's DB program.

1.3 Assessment Methodology

Stakeholder Interviews and Document Review

To gain an understanding of the "as-is" state of WSDOT's DB program, the consultant team performed the following tasks:

- Conducted interviews with various stakeholders including:
  - Several key personnel at various levels and positions within WSDOT's Headquarters Office who have knowledge of the DB program;
  - Various industry representatives (7 representatives from design firms and 8 from contractors) who have performed work for WSDOT; and
  - Several personnel from Washington State House and Senate legislative staff.
- Reviewed WSDOT's existing policies, procedures, standard forms, contracts and other relevant departmental documentation related to DB delivery, including, but not limited to:
  - Design Manual M22-01.13, Chapter 110 – Design Build Projects (July 2016)
  - Project Delivery Method Selection Guidance (February 12, 2016)
  - DB Request for Qualifications draft template
  - DB Request for Proposals (including Instructions to Proposers, Book 1 and Book 2) draft templates
  - DB Guidebook (June 2004)
  - Draft DB Manual Outline (October 20, 2015)
  - DB Project Delivery Guidance Statement Change Orders (December 18, 2009)
  - DB Contract Data – Stipend Summary
  - DB vs DBB 2000-2015
  - Proposal Evaluation Manual, I-405 / SR 167 Interchange Direct Connector Project (May 3, 2016)
  - Small Design-Build Pilot Project Evaluation (May 2015)
  - SR 520 Pontoon Construction Project Internal Review Report (February 26, 2013)
  - WSDOT Recruitment and Retention Study, Final Report (June 27, 2016)

Interviews with Peer Agencies

In conjunction with its review of WSDOT's DB program, the consultant team also interviewed representatives from 12 other transportation agencies to gain an understanding of how WSDOT's peers are managing their DB programs.

The agencies in the comparison group were selected so as to capture a wide range of DB experience and practices. Specific considerations included:

- The size and maturity of the agency's DB program,
- Geographical location, and
- Differences in legislation and DB implementation strategies.

Key information for each peer agency is provided in Table 1.1.

Table 1.1:
Peer Agencies Interviewed

Agency	First Design-Build Project	Total Approximate Number of Design-Build Projects	Size Range of Projects
WSDOT	2000	29	$2M to $300M
Colorado	1995	20	$3M to $300M
Florida	1987	500+	<$0.5M to $558M
Maryland	1998	35	$20M to $500M
Minnesota	1996	33	$1M to $200M
Missouri	2005	<10	$18M to $535M
Ontario	1995	60+	$0.5M to $55M
North Carolina	1999	111	$2M to $460M
Ohio	1995	247	<$0.5M to $430M
Oregon	1999	16	$2M to $130M
Texas	2003	15	$80M to $1B+
Utah	1999	50	$30M to $1B+
Virginia	2001	78	$0.5M to $100M+

All of the peer agencies were extremely cooperative in providing input and sharing documentation related to their DB programs. The Task 2 White Paper, provided on the companion CD, includes a compilation of the interview responses provided by each agency.

Project Evaluation

The consultant team evaluated performance data for six substantially complete WSDOT DB projects, as identified in Table 1.2, to assess the extent to which WSDOT is realizing the perceived advantages of DB. Key advantages of DB, as discussed further in Section 2.2 of this report, include contractor innovation, time savings, costs savings, and improved risk allocation.

Table 1.2:
WSDOT DB Projects Reviewed as Part of this Study

Project	Region	Final Contract Value	Substantial Completion Year
US 2/Rice Road Intersection Safety Improvement	Northwest	$2,410,519	2012
I-5 Skagit River Bridge Permanent Bridge Replacement	Northwest	$7,139,139	2013
SR 167 Puyallup River Bridge Bridge Replacement Project	Olympic	$27,331,648	2015
I-5 et al., Active Traffic Management System	Urban Corridors (NW)	$37,021,000	2011
I-405/I-5 to SR 169 Stage 2 Widening and SR 515 Interchange Project	Northwest	$84, 650,000	2011
SR 520 Eastside Transit and HOV Project	Urban Corridors (NW)	$364,131,001	2015

These projects were selected to obtain a representative cross-section of WSDOT experience, considering the following criteria:

- Project size (small, medium, large)
- Project type (roadway, interchange, bridge, active traffic management system)
- Region (NW, Olympic)
- Program (e.g., 520, 405, small project)

The Task 3 White Paper, provided on the companion CD, summarizes the information received through the project interviews.

In addition to reviewing the available project data and documentation, the team conducted in-depth interviews with the project managers for each of these projects.

To supplement this largely qualitative assessment of WSDOT's project performance, the team also compared select project performance data (e.g., cost growth, number of change orders) to that of comparable projects delivered by other DOTs (as retrieved from an FHWA database of DB projects).

Gap Analysis

Once the "as-is" state of WSDOT's DB program was understood, the consultant team compared various program governance elements currently used by WSDOT to leading industry practices to identify gaps and diagnose any potential organizational or operational issues related to WSDOT's current processes. Leading practices were obtained by synthesizing:

- Practices recommended by the Design-Build Institute of America (DBIA);
- Successful practices identified by the peer agencies;
- Information culled from various published reports and guidance documents published by the Federal Highway Administration, the Transportation Research Board, and similar sources; and
- Lessons-learned from the consultant team's engagement on similar assignments.

The specific governance elements that were compared as part of the gap analysis include the following:

- DB Program Development and Management
- Organizational Structure and Staffing
- Project Delivery Method Selection
- Procurement
- Project Development
- Funding and Cost Estimating
- Risk Allocation
- Contract Administration and Project Execution

From this comparison we were then able to assess the degree to which WSDOT:

- Is in alignment with leading industry practices;
- Is working towards improving practices (partial alignment); or
- Requires improvement to bring practices into alignment.

Recommendations

After determining the degree to which WSDOT is in alignment with leading industry practices for each governance element, the consultant team developed organizational and process improvement recommendations, which, when implemented, will assist WSDOT with obtaining the maximum benefits from DB delivery.

The improvement recommendations were prioritized based on addressing immediate needs, with consideration given to the:

- Proper sequence in which such recommendations should occur;
- Resources required to implement the recommendation (funding, additional full-time employees, etc.); and
- Beneficial impact of the recommendation (operational efficiency, cost / time savings, innovation, etc.).

A high-level implementation plan was developed for the prioritized improvement recommendations.

1.4 Report Structure

The primary focus of this assessment was to develop improvement recommendations to enhance the performance of WSDOT's DB program. To provide context for these recommendations, Chapter 2 provides a general overview of the potential benefits of DB relative to traditional DBB delivery. The remainder of this Report is then organized into the following chapters:

- Chapters 3 – 10 focus on each governance element reviewed as part of this assessment. Each chapter provides a summary of:
  - Industry leading practices,
  - Observations of WSDOT's current process (as contrasted to relevant findings from the interviews with the peer agencies and industry representatives as applicable),
  - Results of the gap analysis, and
  - Improvement recommendations.
- Chapter 11 summarizes the overall improvement recommendations and provides a high-level implementation timeline.

2. Design-Build Overview

This chapter addresses the following general questions in the context of the current state of practice of DB and DBB in the transportation construction industry:

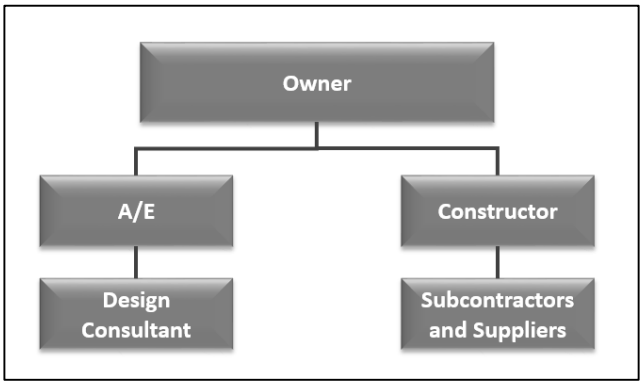
- What are the basic characteristics of DBB and DB?
- What are the advantages and disadvantages related to the use of DBB and DB?
- To what extent is WSDOT achieving the perceived benefits of DB (and/or mitigating the perceived disadvantages of DB)?

2.1 Design-Bid-Build (DBB)

Definition and Key Characteristics

DBB is the traditional procurement approach for transportation projects in the United States, in which the design and construction of a facility are sequential steps in the project development process. As shown in Figure 2.1, design and construction services are procured separately, with Architectural/Engineering (A/E) firms selected based on their qualifications and construction contractors selected based on competitive sealed bids, with award to the bidder with the lowest price who meets specific conditions of responsibility.

Figure 2.1: DBB Delivery System



The foundation of the DBB system was formed through:

- For design service, the professional licensing laws established in the late 1800's, and
- For construction services, competitive bidding requirements reinforced with legislation such as the 1938 Federal Highway Act and the Miller Act that requires surety bonding for construction.[1]

[1] Congress amended the Federal-Aid Road Act of 1916, Ch. 241, 39 Stat. 355, to adopt the precursor to what is now section 112(a). That statute required the Secretary of Agriculture (then the agency head with authority to approve federally funded highway projects) to approve, in connection with federally aided highway construction projects, "only such methods of bidding and such plans and specifications of highway construction for the type or types proposed as will be effective in securing competition and conducive to safety, durability, and economy of maintenance." Pub. L. No. 75-584, § 12, 52 Stat. 633, 636 (1938).

DBB Advantages and Disadvantages

Over the decades, the DBB system has provided taxpayers with adequate transportation facilities at the lowest price. For the most part, it has resulted in a reasonable degree of quality, and has effectively prevented favoritism in spending public funds while stimulating competition in the private sector. However, the separation of services under DBB has the potential to foster adversarial relationships among the parties and result in cost and time growth. Various advantages and disadvantages related to DBB are presented in Table 2.1 below.

Table 2.1: DBB Advantages and Disadvantages

DBB Advantages	DBB Disadvantages
• Applicable to a wide range of projects • Well established and suitable for competitive bidding • Contractor selection based on objective cost criteria • Discourages favoritism in spending public funds while stimulating competition in the private sector • Extensive litigation has resulted in well-established legal precedents • Provides the lowest initial price that responsible, competitive bidders can offer • Clearly defined roles for all parties • Designer directly works for and on behalf of owner • Construction features are typically fully designed and specified • Owners retain significant control over the end product • Insurance and bonding are well defined	• Slower project delivery method due to the sequential nature of delivery (i.e. design then bid then build) • Owner must manage/referee two contracts • Administrative decision-making and approvals are often less efficient and more difficult to coordinate • Owner largely bears risk of design problems • Separation of contracts tends to create an adversarial relationship among the contracting parties (different agendas and objectives) • Designers may have limited knowledge of the true cost and scheduling ramifications of design decisions • No contractor involvement in design has implications on constructability and pre-construction value engineering • Tends to yield base level quality • Least-cost approach often requires higher level of inspection of the work by the owner's staff • Initial low bid might not result in ultimate lowest cost or final best value • No built-in incentives to provide enhanced performance (cost, time, or quality) • Greater potential for cost/time growth • Greater potential for litigation

2.2 Design-Build (DB)

Definition and Key Characteristics

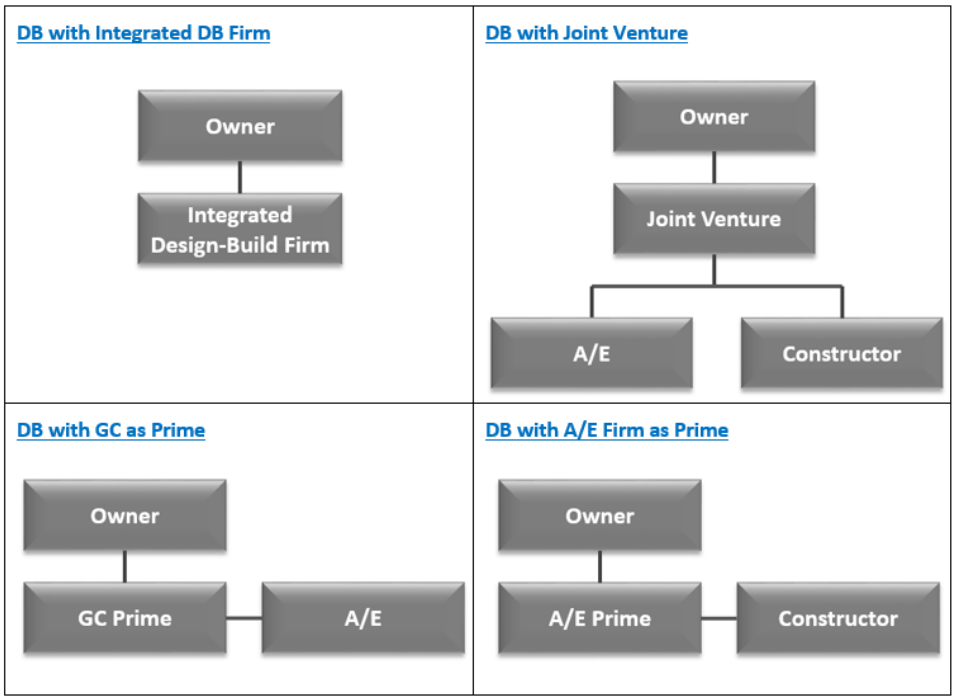
Under the DB contracting method, a single entity is responsible for both the design and construction of a project. This integration of design and construction services under one contract supports:

- Earlier cost and schedule certainty,
- Closer coordination of design and construction, and a
- Non-sequential delivery process that allows for construction to proceed before completion of the final design.

The Federal Highway Administration, among other Federal agencies, has supported the use of DB delivery, and has developed regulatory policies for DB contracting, in addition to providing leadership and support to state and local agencies implementing DB. [2]

As shown in Figure 2.2, DB delivery in its simplest form is characterized by a single contract between the owner and an integrated DB entity that provides both design and construction services. As DB use has evolved, it has taken on organizational variations that may involve joint ventures or more complicated prime and subcontractor arrangements. In the highway sector, DB is most commonly led by a General Contractor (GC) as the Prime with an A/E firm as a subcontractor.

Figure 2.2: DB Organizational Variations



DB Advantages and Disadvantages

Use of DB has in some cases resulted in dramatic improvements in performance, but not without challenges. Empirical studies from the last 20 years comparing DBB with DB across multiple construction sectors have shown use of DB can provide cost and time savings. For example, the first major federal study mandated by Congress compared DB highway projects with comparable DBB projects and found that DB resulted in significant

[2] See Title 23 USC 112 (b) (3) and Federal regulations: Title 23 CFR Part 636

time savings and to a lesser extent cost savings.[3] Conversely, some DOTs have reported higher initial costs or cost growth with DB. The delegation of quality management responsibilities to industry has also been an ongoing concern.

A summary of additional advantages and disadvantages associated with DB is provided in Table 2.2.

Table 2.2: DB Advantages and Disadvantages

DB Advantages	DB Disadvantages
• Single point of responsibility creates opportunity for efficient risk transfer • Can encourage contractor innovation • Early contractor involvement • Owner not at significant risk for design errors • Less owner coordination of A/E and contractor • Time savings and often cost savings • Earlier cost and schedule certainty • Improved owner risk allocation and management options • If using a best-value procurement process for DB: – Ensures that the Department can select a capable, qualified DB contractor – Allows for project schedule, quality, and/or other non-price evaluation criteria to be competed	• Reduced owner control over design process • Time and cost to run a 2-step competitive procurement process • Challenges with scoring technical evaluation factors • Personnel learning curve - changes in roles and responsibilities requiring different levels of training for owner and industry • Potential for higher initial costs (i.e. risk pricing) • Parties assume different and unfamiliar risks • Standard owner communication and contract administration practices in conflict with expedited delivery • Fewer opportunities for smaller contractors with limited resources to serve as prime contractors • Cost for contractors and designers to participate in the procurement process

It is important to note that the advantages of DB are generally only realized when a careful and well-informed approach is taken to enabling legislation, project analysis and selection, procurement, contracting, and oversight. Likewise, some of the identified disadvantages may be averted or mitigated to some extent through similar means.

2.3 Performance of WSDOT's DB Program

To assess the extent to which WSDOT is realizing the perceived advantages of DB, as identified above in Table 2.2, the consultant team evaluated performance data for six substantially complete WSDOT DB projects.

Table 2.3 summarizes the projects on which these advantages were realized (or not realized). Table 2.4 then summarizes the projects on which the potential disadvantages did (or did not) create challenges for the WSDOT project teams.

It should be noted that all six of the projects selected for review were delivered before the Project Delivery Method Selection Guidance (PDMSG) was implemented. For at least two of these projects, staff indicated that in hindsight, DB might not have been the best delivery

[3] 2005 Design-Build Effectiveness Study: On average, the managers of DB projects surveyed in the study estimated that DB project delivery reduced the overall duration of their projects by 14 percent, reduced the total cost of the projects by 3 percent, and maintained the same level of quality as compared to DBB project delivery. The project survey results revealed that DB project delivery, in comparison to DBB, had a mixed impact on project cost depending on the project type, complexity, and size.

option given the projects' advanced level of design, limits on innovation, or other project constraints.

Table 2.3: Realization of DB Advantages

Potential Design-Build Advantages	US 2/Rice Road Intersection Safety Improvements	I-5 Skagit River Bridge Permanent Bridge Replacement	SR 167 Puyallup River Bridge Replacement	I-5 et al. Active Traffic Management System	I-405/I-5 to SR 169 Stage 2 Widening and SR 515 Interchange Project	SR 520 Eastside Transit and HOV Project
Achievement of Project Goals	Yes	Yes	Yes	No	Yes	No
Contractor innovation	No	Yes	Yes	No	Yes	No
Time savings	Yes	Yes	No	No	Yes	No
Cost savings[2]	Yes	Yes	No	No	Yes	Yes
Earlier cost and schedule certainty	No	Yes	No	Yes	Yes	Yes
Improved risk allocation	Yes	Yes	Yes	Yes	Yes	Yes

1. A "yes" indicates that the advantage was realized; whereas a "no" indicates the advantage was not realized.

2. Cost savings were evaluated by comparing final payment prices to the Engineer's Estimates. A "yes" indicates that the Engineer's Estimates were higher than the final payment amount.

As reflected in the above table, WSDOT achieved mixed results on these DB projects in terms of meeting specific project goals and the advantages of DB identified in Table 2.2:

- The goals for the sampled projects included minimizing work zone impacts to the public, delivering quality designs, safety enhancement, managing geotechnical conditions, and time savings. The projects generally met the project goals with the exception of the I-5 ATMS project, for which the staff reported that minimizing traffic impacts was not an appropriate goal for the project (innovation should have been a goal); and for the SR 520 project, the time savings goal was not realized.

- Innovation was realized on three out of six projects. One of the six projects, the US 2/Rice Road Intersection Safety Improvements, was a small ($2.4M) DB project providing contractors with little opportunity for innovation given the advanced level of design at the time of bid.

- Three out of six projects realized time savings. Delays to the SR 520 were primarily caused by owner design changes, the most significant of which entailed a change to retaining walls attributed in part to unforeseen geotechnical conditions and a change to screening/noise wall designs. Delays to the I-5 Active Traffic Management project were caused by changes to technology specifications and scoping for message signs.

- Four of the six projects recorded costs savings (based on a comparison of the WSDOT Engineer's estimate to the final payment amount).

- Early cost and schedule certainty (i.e. compared to traditional bid-build delivery) was reported for four of six projects.

Table 2.4 summarizes projects on which commonly cited disadvantages of using DB delivery were observed. [1]

Table 2.4: Observation of Common DB Disadvantages

Potential DB Disadvantages	US 2/Rice Road Intersection Safety Improvements	I-5 Skagit River Bridge Permanent Bridge Replacement	SR 167 Puyallup River Bridge Replacement	I-5 et al. Active Traffic Management System	I-405/I-5 to SR 169 Stage 2 Widening and SR 515 Interchange Project	SR 520 Eastside Transit and HOV Project
Reduced owner control over design process	No	No	No	Yes	No	Not discussed
Time and cost to run competitive 2-step procurement process	Yes	No	Yes	No	Yes	Not discussed
Potential higher initial costs (i.e., risk pricing)	No	Yes	No	No	No	No
Parties assume different and unfamiliar risks (learning curve)	Yes	Yes	Yes	Yes	Yes	Yes
Standard owner practices conflict with expedited delivery	No	No	No	No	No	Yes
Fewer opportunities for smaller contractors	No	No	No	No	Yes	No

1. A "yes" indicates that the potential disadvantage of DB created challenges for the WSDOT project team. A "no" indicates that the potential disadvantage did not create any issues.

Respondents generally agreed that two potential DB disadvantages created issues for the six WSDOT DB projects reviewed. The first was inexperienced WSDOT staff being challenged by the differing roles and responsibilities on a DB project. This learning curve disadvantage is common with many DOT DB programs until they mature and develop a core of experienced DB staff.

The second disadvantage was the time and cost to run a competitive two-step procurement process. Though perceived as a disadvantage on three of the six projects, in part due to the time and resources required for the ATC process, both DOTs (including WSDOT) and the industry agree that ATCs and one-on-one meetings are effective procurement tools to improve project outcomes, and the benefits outweigh the disadvantages.

Reduced owner control over design was not seen as a challenge by the project managers interviewed for these projects with the exception of the I-5 ATMS project. For this project, the WSDOT Project Engineer concluded that this technology-driven project was not an ideal candidate for DB in the sense that greater owner control and prescription would have resulted in a better outcome (i.e. fewer design changes).

Aside from the I-5 Skagit River Bridge emergency project, bid pricing was lower than the Engineer's estimates; however it is possible that favorable market conditions were a factor in this outcome. Only one project team (that for I-405) perceived that there may have been issues with opportunities (or lack thereof) for smaller contractors.

PART 2

Assessment of WSDOT's DB Program

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Part 2 Objectives

- Address, for each governance element, the extent to which WSDOT is: in alignment with leading industry practices; is working towards improving practices; or requires improvement to bring practices into alignment with best practice.
- Where program enhancements are possible, offer recommendations to assist WSDOT with maximizing the potential benefits of DB delivery.

3. DB Program Development and Management

3.1 Leading Practices

To promote programmatic consistency in the execution of DB projects, many organizations have attempted to formalize their DB processes and procedures. Such formalization or standardization helps establish a sound governance structure within which project sponsors and teams can successfully make decisions and take action to achieve project and organization-wide goals while avoiding unacceptable situations that could increase risks or compromise stakeholder trust.

Possible techniques and strategies to institute such a comprehensive program and project governance structure for DB delivery include the following:

Best Practices in DB Program Development and Management

- Development and maintenance of programmatic documents (e.g., standard policies and procedures, guidance manuals, checklists, forms, standard specifications, etc.) to:
  - facilitate the consistent planning and execution of DB projects;
  - define roles and accountabilities;
  - counter the loss of institutional knowledge (e.g., when long-tenured staff retire or move to new positions); and to
  - facilitate communication, training, and the regular re-evaluation of processes and standards.
- Implementation of scalable processes that set forth minimum requirements for smaller or less complex projects, while mandating enhanced procedures for larger projects;
- Development and maintenance of standard procurement and contract forms to reduce the effort needed by project personnel to develop and review solicitation and contract documents for specific projects;
- Consistent outreach efforts to industry and other stakeholders to assess market conditions and other potential risks and opportunities that could impact the program;
- Regular oversight by senior leadership to provide visibility to the DB program and assure that program outcomes are in keeping with the organization's overarching policies, needs, and goals;
- Standard program-level progress reporting, including key performance indicators (KPIs), to keep senior leadership and other stakeholders apprised of program threats and opportunities; and
- Promotion of a culture of continuous improvement driven by lessons-learned and performance monitoring.

3.2 Observations

In the context of the best practices identified above, the consultant team observes the following:

Programmatic Guidance

1. At the outset of its DB program in 2004, WSDOT developed a DB guidance manual.

    a. For the time, the manual provided well-intentioned guidance and procedural instruction to assist project teams with the planning and development of DB projects.

    b. Since the manual's introduction, WSDOT has developed other standalone DB documents, including the Project Delivery Method Selection Guidance (PDMSG).

    c. Having received few, in any, updates since its introduction, the manual fails to reflect WSDOT's more current DB practices (e.g., use of the PDMSG) and does not provide the detailed guidance project teams need to successfully execute DB projects.

    d. WSDOT's DB practices (particularly those related to post-award contract administration) are therefore largely improvised and are inconsistently applied across WSDOT offices and project teams.

2. Recognizing the need for more standardization and guidance, WSDOT has established an internal DB working group to provide ongoing support for the development of an updated manual that will more formally define and coordinate its DB processes. However, given current resource constraints (as discussed in Section 4.2), the development of this manual remains incomplete.

    a. The proposed table of contents suggests that, once finalized, the updated manual will provide project teams with comprehensive guidance on all aspects of DB delivery, from project development to procurement to contract execution and administration. In addition, the manual can also serve as a possible training resource to help disseminate DB best practices throughout the organization.

    b. Implementation of an updated manual – particularly one that provides a thorough discussion of post-award contract administration - will place WSDOT among the more advanced of the peer agencies interviewed.

    c. Although most of the peer agencies identified guidance on design and construction oversight as an immediate need, few have moved forward with developing detailed training and guidance on the topic. Time and resource constraints, along with a desire to perform the procedure development work in-house (as a means to ensure staff buy-in), were cited as the key barriers to the development of procedural guidance on DB contract administration by the other agencies.

To help transfer and preserve DB knowledge and promote consistency in contract administration, several DOTs (CDOT, FDOT, MDSHA, MoDOT, NCDOT, and VDOT), as well as the Ministry of Transportation Ontario (MTO), have developed DB manuals or guidance documents. For example, the MTO has created a detailed Contract Administration Manual for DB that addresses changes in roles and responsibilities, design administration, construction administration, and inspection.

Contract Templates

Standard contract templates and model forms should be designed to:

- Provide enforceable requirements that clearly define the roles and responsibilities of the contracting parties;
- Reasonably allocate risks to the party that is best able to address and mitigate them; and
- Encourage uniform application of procurement processes and contract management principles across project teams.

3. Most of the peer agencies interviewed have developed, often with consultant assistance, standard templates and forms (e.g., Request for Qualifications, Instructions to Proposers, Requests for Proposals, DB General Provisions, standard performance specifications, etc.) containing boilerplate language as well as instructions for tailoring requirements to project-specific conditions.

    a. Use of such templates can help streamline the effort needed to develop and review solicitation and contract documents for specific projects, while also ensuring that roles and responsibilities related to design, quality, third-party coordination, and similar requirements that may change under DB are clearly and adequately defined. They also help the DOT focus programmatically on its DB procurement, contracting, and execution procedures.

    b. From industry's perspective, the familiarity and comfort level afforded by an owner's repeated use of standardized documents can facilitate their bidding processes and lead to better proposals.

4. WSDOT has been working closely with the Association of General Contractors (AGC) Subcommittee for Design-Build and the American Council of Engineering Companies (ACEC) representation to review standard contract language and template documents. Our understanding is that contract document templates are approximately 80% complete. WSDOT senior leadership should continue to characterize this as a high priority, and commit the internal and external staff resources to complete these templates.

Industry Outreach

5. It is generally recognized that for DB to work well, a mutual level of trust and respect must be established between the owner and industry groups. To this end, all of the DOTs interviewed indicated that they had partnered with industry in developing their DB programs and now continue to meet regularly, which has resulted in greater support for the use of DB.

6. Similarly, WSDOT regularly engages industry and has effectively fostered a collaborative working relationship as it continues to develop and refine its DB program.

Performance Monitoring and Lesson-Learned

7. Efforts that the DOTs recognize to be good practices but which have not yet been widely implemented (primarily due to resource constraints) include:

    - Establishing a database of lessons-learned that could assist with developing future projects.
    - Capturing historical cost and schedule performance to assist with the development of realistic budgets and schedules.

8. Only a few of the DOTs interviewed (FDOT, MDSHA, MnDOT, and Ontario) currently track performance metrics, and none have developed a lessons-learned database.

    a. FDOT and MDSHA track project performance outcomes such as cost increases, time increases, and number of claims.

b. MnDOT monitors more process-oriented metrics such as the DOT's time to respond to ATCs, number of clarifications needed, and variances between promised versus actual dates related to the procurement process.

c. The remaining interviewees all noted that they viewed performance monitoring to be a best practice that they would like to implement in the future, pending available resources.

d. Several of the interviewees also expressed a desire to better document and raise awareness of lessons-learned, which were viewed by some to be just as, if not more, important than tracking metrics. However, as explained by UDOT, tracking performance metrics and lessons-learned can be very resource intensive. Although it has recently conducted a review of change orders on DB projects, UDOT has not yet established a standing database that aggregates all of the data. Similarly, CDOT noted that DB project teams often conduct lessons-learned workshops or after action reviews, but no centralized repository has been established to archive such information.

9. Similar to the other agencies, WSDOT also lacks a formal system to collect and disseminate lessons-learned in a manner that could be used to inform future project development activities. WSDOT also lacks a formal system to monitor any metrics or key performance indicators (KPIs) that could be used to assess the overall performance of WSDOT's DB program in terms cost, schedule, or quality performance, or that could be used to develop comparisons to DBB (or GC/CM) project performance.

a. Although some project managers are already identifying lessons-learned as a project closeout activity, this is not conducted on a consistent basis. However, it is our understanding that WSDOT has an initiative underway to develop a lessons-learned database.

b. One project manager shared an example of the lessons-learned captured for the I-5 Active Traffic Management System project. The format, which included observations and recommendations in the following key areas, could be used to develop a standard template.

- Project Management and Staffing Issues
- Contracts and Project Staff Experience
- Materials and Procurement Issues
- Technical Issues to be Resolved
- Design and Installation Issues
- Testing Plan Issues, Specifications, and Go Live
- New Contractor Difficulties
- Project Closeout

c. WSDOT does maintain a Construction Audit Tracking System (CATS), which is used to evaluate compliance with project-specific contract requirements. Although it is possible to mine the performance data maintained in this system, it has not been used thus far to assess or compare DB to DBB (or GC/CM) project performance.

3.3 Gap Analysis: DB Program Development and Management

	Leading Practices	WSDOT's Alignment with Leading Practices	What is WSDOT doing well?	What are the gaps/risks with WSDOT's current practice?	Recommendations
Programmatic Documents and Guidance	DB processes are standardized and integrated into a comprehensive set of guidance documents (e.g., manuals, templates, etc.) that are: • used consistently across the organization, • enforced by senior management (i.e., used to hold project teams accountable for project performance), and • used to facilitate continuous improvement.	**Partial alignment** Some processes and procedures are defined (e.g., the PDMSG), but are not necessarily structured into an integrated framework that encourages consistent application. An updated DB guidance manual is needed to provide more detailed guidance and to supplement existing design and construction policy manuals. *The peer agencies interviewed have largely created a robust DB infrastructure that includes:* • *DB Manuals* • *DB contract templates* • *Selection Guidance*	• WSDOT recognized the need for updated guidance and has established an internal working group to support the development of a new manual. • WSDOT has strong DB experience in the Central Office and certain regional offices, which can be leveraged to create repeatable guidance and training.	Given the delivery expectations surrounding Connecting Washington projects, lack of an updated DB manual may lead to: • Inconsistency in project execution across project teams and team members • Confusion regarding roles and responsibilities • Ineffective or inefficient use of resources • Missed opportunities to preserve and transfer DB and other institutional knowledge	• Continue to update the DB Manual. • Develop training modules to help roll out the new manual. • Refine procurement and contract templates as necessary.
Standard Contract Forms	Standard contract templates and forms are used to help administer and manage contracts and achieve consistency and fairness in the contracting process.	**Partial alignment** Project teams largely rely on the solicitation and contract documents used on past projects, removing any irrelevant requirements and making modifications as necessary.	WSDOT is working with industry to finalize solicitation and contract templates, which should eliminate any unnecessarily onerous terms that could reduce competition or result in higher bid prices.	A lack of standard templates can create inefficiencies in procurement and contract administration as additional time is needed for project teams to develop project-specific documents and for proposers and WSDOT administrators to familiarize themselves with new terms and conditions.	• Continue to work with industry to develop contract templates. • Train staff on the use and application of standard contract clauses.

	Leading Practices	WSDOT's Alignment with Leading Practices	What is WSDOT doing well?	What are the gaps/risks with WSDOT's current practice?	Recommendations
Performance Monitoring	Project- and program-level performance metrics are monitored and are used to promote strategic decision-making and continuous improvement activities. Standard program progress reports are regularly provided to keep senior leadership apprised of program threats and opportunities.	**No alignment** DB performance metrics are not routinely monitored or used to develop meaningful comparisons to other delivery methods. No standard reporting process has been defined for the DB program. *(Only a few of WSDOT's peers currently track DB performance metrics.)*	Although WSDOT does not specifically monitor the performance of its DB program, it does have some existing tools which could be used to obtain insight into the DB program: • The CAT system could provide a starting point for mining performance data. • The Gray Notebook (WSDOT's quarterly performance report) generally addresses construction cost performance, highlighting the accuracy of Engineers Estimates compared to award amounts.	The current lack of DB program performance data: • Restricts management's ability to proactively identify opportunities to: – Enhance the DB program – Identify or forecast any adverse trends that require management attention • Increases the risk of miscommunication and misunderstanding of institutional goals regarding the DB program. • Increases the difficulty of communicating the benefits of DB to internal and external stakeholders.	• Develop more systematic comparisons of DB with DBB performance to include additional measures of cost and schedule performance. • Maintain a database (in CATs or other) with DB performance metrics (e.g., cost growth, schedule, Non Conformance Reports (NCRs) or Incidents, Change Order types, etc.).
Lessons-Learned	Lessons-learned are formally captured for all projects and are used to drive continuous improvement activities.	**No alignment** Lessons-learned are primarily captured on an ad hoc basis and do not appear to be catalogued or compiled in a manner that could be used to inform future project development activities. *(WSDOT's peers are similarly only discussing lessons-learned on an informal and ad hoc basis, if at all.)*	Recognizing the importance of lessons-learned, WSDOT has an initiative underway to develop a database of lessons-learned.	Not documenting lessons-learned creates missed opportunities to: • Identify any opportunities to streamline, enhance or supplement existing processes to increase staff efficiency or effectiveness • Transfer knowledge to other project teams	• As a project closeout activity, ensure lessons-learned are discussed and documented using a standard format. • Develop a readily accessible database for tracking lessons-learned on DB projects. • Create project report cards to evaluate the extent to which the project met performance goals.

3.4 Recommendations on Program Development and Management

Based on the observations and risks identified above, the consultant team offers the following recommendations and implementation strategies:

1. **Continue to develop and/or update WSDOT's procurement and contract templates.** WSDOT's senior leadership should continue to characterize the completion of these templates as a high priority, and commit the necessary internal and external staff resources to completing this activity. The individuals responsible for the updating of the DB Manual should be closely involved with the development of the contract templates to ensure:

    - Consistency between the Manual and contract documents.
    - Adequate coverage in the Manual of any topics where additional clarification or guidance would be helpful to promote consistent interpretation and enforcement of contract clauses.

    Part of this process should include determining how to make the templates scalable to various project sizes or procurement approaches.

2. **Continue development of an updated DB Manual, and ensure that the manual reflects the policies and procedures needed to promote consistent and effective delivery of WSDOT's DB projects.** Given the limited DB experience of most WSDOT staff, development and maintenance of procedural guides and template documents will help accomplish several important goals:

    - It will require WSDOT to clearly and adequately define its specific DB policies and procedures, particularly relative to roles and responsibilities.
    - It will help preserve and transfer DB and other institutional knowledge, and can be used as the basis for training employees in DB best practices.
    - It can be used as a tool to help educate and communicate with project stakeholders.

    Developing and finalizing the manual is largely dependent upon senior leadership mandating this as a high priority need, and committing the staff resources to make this happen in a reasonable time period. The development of this manual should not be viewed as a simple administrative task, but as an opportunity to engage staff in substantive discussions regarding possible improvements to, or clarification of, current processes or outstanding policy issues, particularly relative to procurement, which are discussed in other recommendations.

    Based on the consultant team's review of the manual's working table of contents, WSDOT should consider including the following additional topics in their DB manual:

    - Scalability of processes to projects of different sizes/complexity (e.g., streamlining procurement options and quality management practices for small or non-complex projects);
    - Roles and responsibilities of outside consultants engaged to assist WSDOT with the procurement and execution of DB projects;

Developing and enforcing a more comprehensive set of DB policies and procedures aligned with leading practices, coupled with a robust staff training program in these best practices, should help WSDOT foster a more sustainable and effective DB program.

- Incorporation of Practical Design into a DB project;

- Determination of effective technical proposal evaluation criteria and associated weightings (with emphasis on how criteria should be informed by project goals and risks);

- Communication plans, and the importance of collaboration, partnering, and co-location to help ensure the expeditious resolution of issues, as needed to support the fast-paced nature of a DB project; and

- Procedure for performance monitoring and tracking of lessons-learned.

- Application of risk analysis results to assist with project development and procurement activities.

In developing content for the manual, care should be taken to determine the best technique for conveying information. In addition to narrative descriptions and text:

- Diagrams and flowcharts can be useful for conveying step-by-step processes and approvals.

- Checklists are beneficial for tracking activities and ensuring task completeness.

- Decision trees and other decision support tools can help with determining the appropriate course of action when options or alternatives are available.

- Example forms, with sample text, can be an effective method for illustrating the appropriate way to complete forms.

- Case studies (highlighting successes or lessons learned) from past WSDOT projects can help make certain topics resonate with readers.

It is our understanding that much of the content for the manual (e.g., policies and procedures) still needs to be developed. Such development work should be done by senior, experienced project managers and external industry resources if necessary. Given this, we suggest the following implementation steps be taken (to the extent not already performed):

(a) Assign an individual from within WSDOT to be in charge of creating the updated manual.

(b) Develop an implementation schedule to be committed to by all key personnel within the department that will be contributing to content development activities.

(c) Conduct workshops with industry representatives to discuss and obtain feedback on any potential changes in policies and procedures that could impact their operations.

We believe that an appropriate target for the completion of these materials is 9 to 12 months after the individual charged with running this activity has been assigned. This individual should also be charged with determining if the

procedures can be developed using in-house resources or if some work must be outsourced to external consultants. Even if consultants are used to facilitate the process, key personnel should still be intimately involved with assessing needs and crafting content to help achieve staff buy-in to any new or changed procedures.

3. **Devise an effective rollout strategy.** To ensure the manual will serve the intended purpose and promote further consistency in DB contract administration, it is necessary to develop and implement an effective strategy for rolling out the manual as well as a process for enforcing the use of the procedures contained therein (i.e., holding the project teams accountable).

   The internal rollout of the manual can be partially accomplished through the training program recommended in Section 4.4.

   An external rollout can be accomplished through industry meetings and by having the programmatic documents published online.

4. **Maintain and update the contract document templates and DB Manual as necessary.** A staff member should be assigned responsibility for maintaining and updating the programmatic documents as additional policies or procurement strategies are adopted.

5. **Develop a framework for monitoring performance, capturing lessons-learned, and fostering a culture of continuous improvement.** As a project closeout activity, lessons-learned should be discussed and documented using a standard format. This could include the creation of project "report cards" to evaluate the extent to which the project met performance goals and to document what went well and what did not go as expected.

   As a longer term goal, these lessons learned should be archived into a readily accessible and searchable database to assist future project development activities. As an additional aspect of this framework, all administrative procedures should be reviewed periodically (e.g., on an annual or biennial basis) to assess compliance and to identify any opportunities to streamline, enhance or supplement existing processes to increase staff efficiency or effectiveness.

   Part of this goal should entail supporting the ability to efficiently roll up detailed metrics (e.g., cost growth, project duration, change orders, quality, etc.) in a user-friendly format that can be used to:

   - Identify any adverse trends that require management attention.
   - Compare DB project performance against DBB (and GC/CM) projects with comparable scope and cost.
   - Assess whether the PDMSG, DB Manual, and document templates require refinement.

4. Organizational Structure, Staffing, & Training

4.1 Leading Practices

As acknowledged by all of the agencies interviewed, the traditional policies and procedures developed to support the standard DBB system will not directly transfer to the implementation of DB. DB often demands different skills, processes, and management and coordination efforts for implementation to be successful. Fully integrating the DB delivery option into a DOT's capital construction program therefore entails fostering a new cultural and organizational context that establishes distinct roles, responsibilities, and standards for DB delivery.

Organizational practices adopted by owners with mature DB programs to ensure the successful delivery of their projects include the following:

Best Practices in Organizational Structure and Staffing

- Establishment of an organizational unit dedicated to administering and coordinating the DB program in recognition of DB projects requiring different skills and management and coordination efforts for implementation to be successful, and that some staff may have difficulty transitioning to the DB process;

- Selection of project teams based in part on their education and experience in the implementation of DB best practices, as well on having personalities well-suited to the leadership and collaborative skills needed to align the often disparate interests of DB project participants;

- Avoidance of cyclic hiring and downsizing plans (which can act to erode morale and deplete institutional knowledge), in favor of nurturing a stable workforce that has the skills and leadership ability to deliver both small and large projects;

- Support of attractive career development paths, which emphasize education, training and continuing personal and professional development, to attract and retain key personnel and ensure a sustainable core workforce;

- Training of personnel on fundamental DB principles, supplemented by peer-to-peer information exchanges as a way to transfer project management knowledge to targeted audiences;

- Commitment of senior leaders to the success of the DB program by:

  - Recognizing the need for key personnel to be trained and educated in DB best practices;
  - Empowering project engineers with appropriate decision-making authority to help ensure timely resolution of any issues encountered; and
  - Championing DB benefits both to internal staff and to other stakeholders.

- Alignment of functional support areas and other project partners to ensure the organizational structure supports the effective planning, design, procurement,

execution, and closeout of projects (to this end, train and develop subject matter experts capable of effectively carrying out supporting activities such as proposal evaluations and design reviews in a manner that supports the DB process);

- Active involvement of key personnel for the duration of the project to:
  - help ensure that valuable information is not lost between project phases (thereby reducing or eliminating project learning curves),
  - foster consistent and timely communication, collaboration, and issue resolution with the design-builder, and
  - hold project teams accountable for decision-making.

4.2 Observations

Internal Staffing and Organization

In the context of the best practices identified above, the consultant team observes the following:

1. WSDOT has assigned staff at the Headquarters level (currently 1 full-time Design-Build Engineer supported by a part-time Assistant State Construction Engineer) dedicated to the development and coordination of the DB program.

2. It is our understanding that WSDOT plans to expand this DB unit to 2 full-time personnel supported by 1 part-time staff member (i.e. 2-1/2 staff) in the near future to accommodate an anticipated increase in the use of DB through the Connecting Washington funding.

3. WSDOT's dedicated DB unit, particularly once enlarged, will be comparable to those established in other DOTs.

4. As summarized in Table 4.1, all of the agencies interviewed have at least one full-time staff position in their Headquarters or the Central Office acting as an organizational unit dedicated to administering, coordinating, and championing the DB program. (Note that TXDOT, with 86 full-time DB positions, is an outlier in that DB is only implemented for mega or very large projects.)

Table 4.1: Dedicated DB Staff Positions

State	Internal Staffing	
	Dedicated Fulltime Positions	Part time Support
Washington (planned)	2	1
Colorado	1	2
Florida	3	-
Maryland	1	-
Minnesota	3	-
Missouri	1	-
North Carolina [(a)]	15	-
Ontario (MTO)	8	-
Ohio	1	3

State	Internal Staffing	
	Dedicated Fulltime Positions	Part time Support
Oregon	1	-
Texas	86	-
Utah [(b)]	1	1
Virginia	8	-

[(a)] Staff are dedicated to both DB and P3 delivery

[(b)] 1 F/T manager overseeing DB and CM/GC programs, supported by 1 P/T position focused on DB and 1 P/T position on CM/GC

5. Differences in the level and mix of staffing shown in Table 4.1 can be attributed to a number of factors, including the DOT's:

   - management culture (i.e. centralized versus decentralized),
   - program size,
   - source of funding, and
   - level of outsourcing.

   For example, NCDOT describes itself as a centralized organization where all DB projects are developed, procured, and managed at the Central Office with a dedicated team of 15 fulltime staff. In contrast, FDOT, despite its large DB program (over 500 DB projects total), largely has a decentralized management structure where the District personnel have the authority to develop, procure, and deliver DB projects using consultant resources; the Central Office staff in FDOT's case primarily acts to establish policies and procedures and as a sounding board for issues.

For the majority of the DOTs interviewed, as well as for WSDOT, the primary role of the dedicated Central Office staff, at the programmatic level, is to develop and maintain DB contract and procedural documents and to provide training and outreach to internal and external stakeholders.

Staff Experience and Skillsets

6. DB expertise is not widely dispersed across WSDOT staff. Staff experience is primarily concentrated in the Northwest and Olympic Regions, where most of the DB projects have been located. However, even within these regions, most staff outside of those working directly on DB projects have limited DB knowledge or experience.

7. It is our understanding that WSDOT staff have been challenged on past projects by the differing roles and responsibilities on a DB project. This learning curve disadvantage is common with many DOT DB programs until they mature and develop a core of experienced DB staff.

8. WSDOT's 2016 Recruitment and Retention Study report indicated that there is a perception among current and former WSDOT staff that DB delivery requires WSDOT designers to transition away from the engineering work they were trained and hired to perform towards a more administrative role in which they simply oversee consultant engineers.

   This finding reveals a common misconception that DB delivery can act to displace an owner's own experienced and knowledgeable design staff as design work is "outsourced" to industry. However, based on the experience of the DOTs interviewed, reality does not support this perception. Instead, DB practitioners would argue that the project development and design oversight work needed to advance a DB project generally demands more active involvement from senior

Of the six projects reviewed by the research team, several were staffed with individuals who had limited to no previous experience with DB, which created learning-curve challenges on the project. These projects included:

- US 2/Rice Road
- I-5 ATMS
- SR 520

design staff than comparable DBB projects (although fewer opportunities may exist to delegate work to junior staff members). Reasons cited included the following:

- Developing DB scopes of work in terms of minimum requirements and expectations can often be much more challenging and resource-intensive than developing 100% complete designs that largely rely on the DOT's previously developed standard specifications and standard details.

- Effectively implementing a best-value procurement process requires the DOT's subject matter experts to develop meaningful criteria for evaluating proposals that align with the goals of the project and reveal clear differences among the proposers.

- Providing effective design oversight requires DOT staff to understand how to review submittals for compliance to contractual requirements and to be open to solutions that may not be consistent with their own preferences.

- The fast-paced and collaborative nature of DB projects requires higher level management and decision-making skills, which can accelerate the career development of DOT engineering staff by placing them in leadership positions earlier in their career trajectories.

Project Teams

The staff assigned to an owner's DB project team should be:

- Well-versed in DB concepts, particularly with regard to its potential benefits and how it differs from the standard delivery approach
- Committed to the project from inception to completion

9. Unlike WSDOT's traditional project delivery process, in which individual team members may not be active during all phases of a project's lifecycle, DB projects benefit greatly from the continued involvement of key personnel from project inception to project completion. For example, leading practice suggests that:

    - Field construction representatives, who will ultimately be overseeing construction, should participate in the RFP development process to ensure that construction-phase issues (e.g., the quality management process, inclusion of "witness-and-hold" points, long-term maintenance considerations of possible design alternates, maintenance and protection of traffic, etc.) are given the appropriate attention in both the RFP itself and in the evaluation and selection of the design-builder.

    - Similarly, the designers and engineers that participate in the preliminary design work and in preparation of the RFP should remain involved after contract award to oversee and review the design-builder's design submittals and to respond to any Requests for Information (RFIs) and Requests for Change Orders.

10. Based on interviews with WSDOT project personnel, this leading practice was not always observed on past projects (generally due to staffing constraints).

    a. Project Engineers often were not consulted during the procurement process and disagreed with the evaluation criteria used to select the design-builder.

    b. Design staff were transferred to other projects at the conclusion of the design phase, leading to a knowledge gap among the project participants that impacted timely decision-making.

Internal Technical Resources

11. Development of effective DB scopes of work and procurement documents, as well as the proper oversight of design-builders, often requires project teams to seek assistance from internal technical resources (e.g., engineering and design staff with expertise in structures, environmental, geotechnical, etc.).

12. Such supplementary resources can provide effective and valuable expertise if they have had adequate exposure to the DB process through either training or project experience. It appears, however, that on past DB projects, WSDOT designers, who did not possess adequate understanding of the DB process, took actions that were contrary to DB best practices and unintentionally compromised the transfer of design risk to the design-builder. For example,

    a. A finding included in the SR 520 Pontoon Construction Project Internal Review Report (February 26, 2013) indicated that staff in the Bridge and Structures Office:

       Either did not understand the appropriate level of design and specifications for a Design-Build contract or, if they did, they did not communicate that they were advancing their design to higher, more prescriptive level than the SR 520 Program office or WSDOT Executives expected.

       The finding suggests that project performance was hampered in part by:

       - Design staff having inadequate understanding of the scope development process for DB, and
       - Ineffective/dysfunctional communication between the program office and design staff.

    b. Several of the project engineers interviewed indicated that oversight of the design-builder's execution of the final design process was also challenging for staff who were relatively inexperienced with DB. For example, the project engineer for the SR 520 Eastside Transit and HOV Project indicated that design staff, despite having excellent technical skills, initially had difficulty understanding how to review design deliverables for contractual compliance.

       The oversight process for this project was also challenged by a lack of dedicated staff having the right expertise and project knowledge, as design development staff were transitioned off the project too soon to address field design changes.

On the I-5 Skagit River Bridge Replacement Project, design oversight issues were largely avoided by assigning sufficient resources to the project (including a dedicated bridge engineer), to ensure quick turnaround of submittals as needed to support the accerlated DB schedule.

Use of Consultants

13. In addition to obtaining assistance from internal technical resources, most DOTs, including WSDOT, also rely on outside consultants to some extent to support the development and/or administration of their DB programs. As summarized in Table 4.2, consultants are most often used to assist with development of solicitation documents and preliminary engineering.

Table 4.2:
Use of Outside Consultants

State	Development of Solicitation Documents	Project Development and/or Preliminary Engineering	Design Oversight	Construction Engineering and Inspection
Washington		X	X	X
Colorado	X			
Florida		X		X
Maryland		X		
Minnesota	X	X	X	
Missouri	X			
North Carolina				
Ontario (MTO)	X	X		
Ohio		X		X
Oregon	X		X	X
Texas	X	X		
Utah		X		
Virginia		X	X	X

14. Some correlation can be seen between size of a DOT's DB program and its reliance on outside consultants. Those agencies with larger DB programs, either by number or size of DB projects, (e.g. FDOT, TXDOT, and VDOT) tend to be highly outsourced, with consultants used for multiple aspects of project development and management, including preliminary engineering, design oversight, and construction engineering and inspection. [NCDOT, which also has a large DB program, is an exception to this finding in that it has chosen to build up a relatively large internal group of 15 dedicated staff positions instead of relying on consultants.] Agencies with lower levels of outsourcing tend to use consultants more selectively where specialized expertise is required.

15. The increase in WSDOT's capital program, as provided through the new Connecting Washington funding, is anticipated to require an increase in the use of DB to ensure the program can be delivered in the required time frame. Given WSDOT's staffing constraints, delivery of the upcoming projects will likely require increased use of supplemental consultant staff, consistent with the experience of other DOTs that had to ramp up a DB program.

16. As programs mature, consultant involvement may decline to some extent. Some agencies (MnDOT, MoDOT, Oregon DOT) noted that they relied heavily on consultants to develop their initial DB programs, prepare standard templates, and assist with training and/or staff development. However, as internal staff gained

more experience with DB, the need for consultant assistance became less critical. For example,

- MnDOT indicated that although it views outsourcing to be a "good startup model," it is now seeking to internalize more DB functions.

- Similarly, MoDOT reported that after its first 3 DB projects, it was able to scale back consultant use and now only retains consultants to provide expertise in discipline areas for which it lacks resources in-house.

- Expressing a similar sentiment, Oregon DOT noted that if it were to pursue DB projects again in the future, consultant use would be based on project needs and available internal resources.

17. Although outside consultants can provide much needed assistance, particularly during the early development and expansion of a DOT's DB program, overreliance on consultants can stunt the growth and development of the DOT's own staff, creating a void of sufficient DB experience and qualifications to provide meaningful project-level decision-making. A common complaint regarding WSDOT's DB program voiced by industry representatives was that WSDOT often yielded too much control to its consultant resources, particularly for design reviews. The issue stems in part from the perception that the consultants, who are paid by the hour, are incentivized to be unnecessarily critical of design-builder submissions.

When using consultants, WSDOT staff should continue to maintain control and responsibility for design reviews and decision-making. Consultants should be used in a supporting role.

Training

18. As noted in Observation No. 6 above, WSDOT staff are largely unfamiliar with the DB delivery method, a knowledge gap that can be attributed at least in part to the lack of a formalized DB training program. Training efforts at WSDOT are largely ad hoc, with most staff learning on the job through the mentoring efforts of experienced Project Engineers.

19. In contrast, most of the agencies interviewed have instituted some type of formal training program. For example,

    a. Each year Florida DOT, through its Design-Build Task Force, conducts training for District and Project Engineers on specific DB topics.

    b. Similarly, Colorado, Ohio, and Virginia DOTs have developed classroom DB training modules addressing project development, procurement and contracts, and post-award contract administration. The training may include role playing, exercises, and case studies designed to enhance understanding of DB delivery.

    c. UDOT has successfully used peer-to-peer information exchanges as a way to transfer DB knowledge to targeted audiences. For example, if a project manager who is not that well-versed in DB processes is identified for a future project, he/she will be brought on to observe or shadow an experienced project manager assigned to an active DB project. UDOT has also found it beneficial to organize face-to-face meetings between current DB project teams that are in the post-award project phase with teams that are still in procurement to discuss any lessons learned. Similarly, UDOT has organized training for project team members assigned to specific roles, with a focus on what individuals assigned to

An effective training program can be used to help communicate the potential benefits of DB and discuss how DB differs from the traditional DBB process.

those roles in the past would want to convey to future team members (e.g., top 10 design phase tips).

d. Some agencies also noted that they often hold workshops with individuals serving on technical proposal scoring committees to emphasize the need to score only against the minimum requirements stipulated in the RFP rather than according to their own preferences.

4.3 Gap Analysis: Organizational Structure, Staffing, and Training

	Leading Practices	WSDOT's Alignment with Leading Practices	What is WSDOT doing well?	What are the gaps/risks with WSDOT's current practice?	Recommendations
Organizational Structure	A core group of dedicated DB professionals is in place and is committed to supporting the successful execution of DB projects.	**Partial alignment** WSDOT has dedicated staff (currently 1 full-time DB Engineer supported by a part-time Assistant State Construction Engineer) assigned to supporting the DB program. However, given the size of the "Connecting Washington" program compared to the DB program to date, HQ appears to be somewhat understaffed to effectively administer and coordinate the anticipated expansion of the DB program.	Similar to other DOTs, dedicated personnel, experienced with DB delivery, have been assigned to administer the DB program.	Without additional full-time staff dedicated to the DB program, it will be challenging to provide the resources necessary to effectively: • Develop and rollout programmatic documents, • Develop and support training efforts, • Provide technical support to project teams, and • Conduct industry outreach.	WSDOT should follow through on its commitment to increase its headquarters DB staff from 1-1/2 to 2-1/2 FTEs, which should provide sufficient resources to oversee the development of the recommended programmatic documents and training program, as well as the anticipated expansion of the DB program.

	Leading Practices	WSDOT's Alignment with Leading Practices	What is WSDOT doing well?	What are the gaps/risks with WSDOT's current practice?	Recommendations
Staff Experience and Expertise	WSDOT personnel assigned to DB project teams are: • Trained and experienced in the implementation of DB project delivery; • Have personalities well-suited to the leadership and collaborative skills needed on DB projects; • Sized to effectively deliver the DB program (i.e., project teams are dedicated to a single or a few projects); and • Viewed by senior management as a strategic asset to helping fulfill the organization's needs and goals.	**Partial alignment** DB expertise is not widely dispersed across WSDOT staff. Staff experience is primarily concentrated in the Northwest and Olympic Regions, where most of the DB projects have been located. However, even within these regions, most staff outside of those working directly on DB projects have limited DB knowledge or experience.	• Although DB expertise is not widely dispersed across WSDOT staff, a strong knowledge base of experience and lessons learned now exists among the project team members working in the Puget Sound area. Tapping this knowledge base can provide an effective starting point for development of a robust training program designed to transfer and instill this knowledge to others within WSDOT. • Peer-to-peer mentoring is taking place organically, as WSDOT staff with DB experience recognize the strengths and weaknesses in their colleagues and provide the guidance and support needed to help them properly fulfil their designated role on a DB project team.	Lack of staff resources having knowledge and expertise in DB best practices increases the risk of: • Confusion regarding roles and responsibilities on DB projects; • Inconsistent project oversight leading to cost or schedule growth; • Overreliance on consultants; • Ineffective decision-making; and • Stakeholder dissatisfaction.	• Foster an organization-wide commitment to DB training. • Impress upon senior leaders the importance of cultivating a positive message regarding DB that attracts and retains a committed core workforce with the appropriate skills and competencies.

	Leading Practices	WSDOT's Alignment with Leading Practices	What is WSDOT doing well?	What are the gaps/risks with WSDOT's current practice?	Recommendations
Training and Staff Development	Formal training, career development paths, and succession plans are established to help retain key personnel and ensure a sustainable core workforce that is educated and trained in DB concepts.	**Partial alignment** WSDOT currently lacks a formalized DB training program. Training efforts remain mostly ad hoc, with most staff learning on the job through the mentoring efforts of experienced Project Managers. *(Many of WSDOT's peers are in closer alignment to best practice, regularly conducting formalized training and/or promoting peer-to-peer information exchanges to transfer and instill DB information throughout their organizations)*	WSDOT HQ staff recognizes a need for more formal and standardized training in DB concepts, particularly with regard to changing roles and responsibilities.	Inadequate training and staff development opportunities can lead to: • High turnover among experienced staff who may feel that ample opportunities do not exist for advancement • A loss of core DB competencies within WSDOT (therefore requiring continued reliance on consultants) • Confusion regarding the skillset needed for owners to effectively oversee DB projects (as evidenced by the recent Staffing study which revealed a staff perception that DB use requires an owner's own design staff to transition away from performing engineering work)	• Develop formal statewide training materials to include DB basics and more advanced modules for project development (scoping), procurement, contract development, contract administration, and other specialty topics. • Expand mentoring, shadowing, and peer-to-peer exchanges. • Establish a thoughtful career development process that acts to attract and retain experienced DB staff through exposure to diverse DB projects and a more competitive compensation structure. • WSDOT's senior leaders should continue to cultivate a positive message regarding DB that attracts and retains a committed core workforce with the appropriate skills and competencies.

	Leading Practices	WSDOT's Alignment with Leading Practices	What is WSDOT doing well?	What are the gaps/risks with WSDOT's current practice?	Recommendations
Continuity of Project Teams	Active involvement of key personnel for the duration of the project to help reduce or eliminate project learning curves and to foster consistent and timely communication, collaboration, and issue resolution with the design-builder.	**Partial alignment** It our understanding that WSDOT strives to commit project teams to projects as necessary. However, in the past, key personnel often transitioned off of projects at inopportune times.	WSDOT recognizes the value of assigning more "cradle-to-grave" responsibility to project teams, particularly the Project Engineer, and is attempting to commit these resources to the duration of a project.	In the past, key personnel often transitioned off of projects at inopportune times. Insufficient project resources can compromise: • Timely communication and issue resolution • Effective oversight of the work	After the decision is made to use DB for a larger project, project staffing requirements should be assessed to determine any need to augment WSDOT staff with experienced consultant staff to support project execution phase (i.e. design reviews, construction inspection, responses to RFIs, quality management, etc.).

4.4 Recommendations on Organizational Structure and Staffing

To successfully accomplish the anticipated increase in DB projects stemming from the Connecting Washington legislation, DB knowledge and expertise must become more widely dispersed throughout the WSDOT organization. Recommendations and implementation strategies for achieving this goal include the following:

1. **Use full-time Headquarters staff to support the development of programmatic DB documents.** It is our understanding that WSDOT has recently committed to increasing the size of its dedicated DB organizational unit from 1.5 to 2.5 fulltime equivalents. In furtherance of Recommendation 2 in Section 3.4, regarding the development of an updated DB Manual, this staff should focus their near term (next 6 to 12 months) efforts on:

    - Supporting the development of formal policies and procedures (i.e., finalizing the DB Manual)
    - Developing and implementing a statewide DB training program
    - Completing and/or refining procurement and contract templates
    - Continuing public and industry outreach efforts
    - Developing a DB lessons-learned / performance database.

    As part of a longer-term implementation strategy, this staff should be used, in conjunction with regional staff as appropriate, to present DB training to all Regions (see Recommendation No. 2 below for more details on training recommendations).

    After the updated DB Manual and training program is rolled out, staffing levels at Headquarters can be reevaluated and adjusted based on the needs of the Regions.

2. **Enhance the skills (and increase the number) of knowledgeable DB Project Managers in Regions outside of Puget Sound area (e.g. Eastern, Southwest, North and South Central) through formal training, mentoring or shadowing, and peer-to-peer exchanges.** To help roll-out the DB Manual and broaden the application of DB to Regions outside of the Puget Sound area, it would be helpful to develop a formal training program on fundamental DB principles affecting procurement, contracting, and project execution. The training should not be generic, but specific to how projects are developed and delivered at WSDOT to articulate and reinforce WSDOT's current policies and procedures.

    The first step to developing a training program is to determine how best to deliver the information to the targeted audience. Options include some combination of:

    - Classroom-style instruction aided by formal training materials (e.g., slide presentations, participant workbooks, case studies, etc.);
    - "Lunch-and-learn" sessions to discuss recent project successes and lessons learned;

WSDOT's mandate under the Connecting Washington legislation is to create a sustainable core workforce at current staffing levels. To achieve this goal, while also increasing the use of DB to deliver the capital program in the required time frame, will require WSDOT to:

- Expand WSDOT's DB knowledge base
- Increase training efforts
- Support career develoment
- Optimize the use of consultant resources

Possible training topcs include:

- Project development (e.g., scoping, goal-setting, risk identification, estimating, client communication, etc.)
- Procurement and contracts (e.g., delivery method selection, proposal evaluation, etc.)
- Post-award contract administration

- Formal mentoring efforts with junior staff "shadowing" more senior staff; and

- Information exchanges with other agencies with DB experience, as well as participation at DBIA, FHWA, or AASHTO DB forums (which may entail out-of-state travel as an additional training expense).

Development of the training program is dependent upon, among other things:

- Completion of the DB Manual and the contract templates; and

- Determination of:

  – whether the training program will be developed using in-house or external resources;

  – whether the trainers will be in-house, external, or a combination of both;

  – who will be trained and over what period of time; and

  – how often "refresher" training should be provided after the delivery of the initial training.

Development of the training program can be started concurrent with the DB Manual, with a target for finalizing any necessary materials approximately three months after the completion of the updated DB Manual.

3. **Identify and train subject matter experts in various technical disciplines.** Experts in various technical disciplines (e.g., bridge, roadway, geotechnical, environmental, etc.) are often consulted on DB projects to assist Headquarters DB staff and the project teams with project development, procurement, and design and construction oversight activities.

   To ensure these individuals can effectively support the DB process, they should receive additional specialized training on topics such as:

   - DB scope development
   - Use of performance criteria/requirements
   - Goal setting and evaluation criteria
   - Alternative Technical Concepts (ATCs)
   - Design review process
   - Responses to requests for information/clarification
   - Change management
   - Quality verification

4. **Support career development.** Because WSDOT staff make attractive hires for local industry, WSDOT needs to make an active effort to retain experienced DB staff on WSDOT's payroll.

   To help retain talented staff, WSDOT should recognize employees who assume a leadership role in managing and executing DB projects, and ensure that there that there is a formal career development process in place that:

   - Allows such employees to gain valuable on-the-job experience on a diverse set of projects;
   - Encourages and supports continuing industry education (e.g., training and certification provided by organizations such as DBIA); and
   - Provides opportunities for staff to actively engage in national or local association activities (e.g., DBIA and TRB) by seeking out speaking engagements and assuming leadership roles.

   In addition to the above, WSDOT should remain cognizant of how the compensation and benefits packages offered to such individuals measure up to those offered by comparable public and private sector opportunities, and ensure, to the best it is able, that WSDOT appropriately recognizes experience and talent. The recent WSDOT Recruitment and Retention study results can provide insight into the need to update the overall compensation structure.

5. **Optimize the role of consultants with regard to decision-making and supporting DOT staff for DB projects.** Outside consultants can provide valuable support and expertise for developing programmatic documents, as well as for managing peak workloads to avoid cyclic hiring. However, the use of consultants must be balanced against the need to develop core DB competencies within the WSDOT staff accountable for decision-making and project performance.

   For a larger project, after the decision is made to use DB, project staffing requirements should be assessed to determine any need to augment DOT staff with experienced consultant staff to support project execution (i.e. design reviews, construction inspection, responses to RFIs, quality management, etc.).

The development and maintenance of DB procedural guidance, standard templates, and formal training programs can help impart the necessary knowledge, lessons-learned, and skills upon DOT staff assigned to deliver DB projects. Gaining experience on DB projects and realizing firsthand the potential benefits DB can offer can act to further dispel any fears or misconceptions related to DB use.

5. Project Development

5.1 Leading Practices

DB delivery fundamentally changes the traditional project development process. Instead of taking design to 100% completion, the key project development task for an owner is to instead craft an adequate and realistic project scope that will ensure the needs of the agency and other stakeholders will be met, without materially compromising the intended risk allocation strategy, stifling creativity and innovation, affecting value for money, or otherwise detracting from project goals.

Project scoping is of critical importance for DB projects as it provides the basis for the design-builder's pricing and subsequent design and construction completion efforts.

Recognizing that a project's development phase represents the best chance to fully influence project outcomes, organizations with mature DB programs generally apply extreme care to defining and developing the project's size and scope and, once established, adhere to strict standards for controlling any scope or schedule changes.

Several best practices used by successful organizations to impart discipline and repeatability to the project development process are summarized below:

Best Practices in Project Development

- Develop clear guidance that clarifies how project development practices can change under different project delivery methods;
- Collaborate with key project stakeholders (including those that will ultimately operate and maintain the work) at the early stages of project planning to identify project goals, risks, constraints, and priorities;
- Structuring and packaging of projects in a way that enhances cost and schedule efficiencies, reduces administrative burden, and maximizes participation by the contracting community (which in turn can lead to better bid pricing);
- Align level of scope definition to project goals (e.g., maximize use of performance requirements when innovation is a goal);
- Perform sufficient preliminary engineering and investigative work (e.g., geotechnical/environmental investigations, permitting, etc.) to:
  - Develop a realistic understanding of the project's scope and budget, and
  - Provide proposers with information that they can reasonably rely on in establishing their price and other commercial decisions.
- Perform outreach as needed to coordinate regulatory and other third-party coordination issues so as to reduce external bottlenecks in project execution.

5.2 Observations

In the context of the best practices identified above, the consultant team observes the following:

Scoping and Preliminary Investigations

1. WSDOT HQ lacks a standard policy and guidance that the regions/programs can use to develop appropriate scopes for DB projects. In accordance with WSDOT's Design Manual, the standard process requiring development of a project summary package applies regardless of delivery method. However, Headquarters staff indicated that each Region has flexibility to otherwise modify the processes for DB as long as the required deliverables are produced.

2. This flexibility has in some cases resulted in a level of design or detail that did not match what was needed for a project, and/or WSDOT not achieving some of the desired benefits of DB, such as cost and time savings or contractor innovation. For example,

    - For the SR 520 Eastside Transit project, the procurement documents did not clearly define the geotechnical risks the project could encounter. WSDOT ultimately required a change to the retaining walls, which could be attributed in part to unforeseen geotechnical conditions. The screening/noise wall design also underwent a significant change post-award. Such changes contributed to project delays.

    - Delays to the I-5 Active Traffic Management project were caused by changes made by WSDOT to the technology specifications and the scope of work for message signs.

    - Had WSDOT performed additional upfront investigation on the SR 167 project, work that was ultimately paid for under a change order could have been included as part of the original scope of work (thus eliminating the premium cost associated with negotiating a change order after award).

Lessons-learned shared by the peer agencies:

- The scope needs to address both what the DOT wants and does <u>not</u> want with regard to design options.
- Limiting scope development activities to a core group of staff that fully understands the DB process generally results in better proposals and pricing.
- Project goals should inform the level of design and front-end investigation work.

3. All of the agencies interviewed agreed that sufficient preliminary engineering must be performed to obtain the necessary environmental clearances and to adequately understand and define project risks.

    Although federal regulations allow agencies to issue RFPs and select design-builders prior to completing the National Environmental Policy Act (NEPA) process, none of the agencies interviewed expressed a desire to pursue such an approach.

4. The appropriate level of front-end work should be informed in part by the identified project risks. Although WSDOT has a very mature standardized risk assessment process that is used to identify and evaluate project risks that could impact budget and schedule, the extent to which WSDOT's risk evaluation process is integrated with other project development activities, such as scoping and selection of appropriate proposal evaluation criteria, is unclear. For example, given the geotechnical risks on the SR 520 project, it may have been beneficial to evaluate proposers' geotechnical design/approach as part of the scored criteria and to have more fully defined the risks in the solicitation documents

Although preliminary design work should not be advanced too far by the owner, appropriate front-end tasks must still be performed to ensure the development of a realistic understanding of the project's scope and budget and to provide proposers with information that they can reasonably rely upon in establishing their price.

Performance Specifications

5. Use of performance specifications is generally viewed as a best practice for DB delivery to provide the greatest opportunity for contractor flexibility and innovation.

    a. Industry representatives, for example, indicated that they are more likely to propose on DB opportunities that allow for flexibility and innovation (which they see as providing a competitive advantage).

    b. Although most of the agencies acknowledged that performance specifications are a DB best practice, they noted that their DB project requirements still tend to be fairly prescriptive due to:

        - The need to advance the design to satisfy the NEPA process and to accommodate project constraints or third party (or joint jurisdictional) issues;
        - Public safety concerns; and
        - Unwillingness by some DOT departments (e.g., structural, traffic control, etc.) to allow deviations from Standard Specifications.

6. Similar to some of the peer agencies, WSDOT generally uses more prescriptive specifications, and then relies on a resource-intensive ATC process to achieve innovation.

7. Most of the peer agencies indicated that they attempt to use the identified project goals to help determine whether or not to use performance specifications. For example,

    a. If contractor innovation is the primary goal, the preliminary design should only be advanced to the level needed to identify the minimum requirements and technical criteria in accordance with the risks to be allocated to the design-builder. Performance specifications should then be used to the extent possible to provide the greatest opportunity for flexibility and innovation.

    b. In contrast, if an expedited delivery schedule is the motivating factor for using DB, a higher level of design and prescription may result in better pricing and allow for a quicker and more streamlined procurement process (e.g., low bid). As explained by NCDOT, even with prescriptive specifications, design and construction flexibility can still be achieved through the ATC process.

Practical Design

8. DOTs with mature DB programs that also implement Practical Design (PD),

    - Incorporate PD as early as possible in design development;
    - Integrate PD as part of the procurement process, encouraging proposers to submit ATCs that take advantage of cost-saving PD ideas; and
    - Publish guidance regarding the PD process.

Practical Design (PD) encourages design flexibility to find lower cost design solutions that meet a project's purpose and need.

9. Due to concerns that implementing PD during procurement will result in an unequal playing field for proposers, WSDOT currently is piloting PD only as a post-award process, referred to as a "Practical Design Pause." If the parties agree, a Practical Design Workshop (PDW) is held prior to Notice to Proceed and may last up to 30 calendar days.

    a. The purpose of the PDW is to explore ideas that differ from the work included in the original Contract, and to identify cost reduction ideas and other potential Contract changes, while continuing to satisfy the project's purpose and need.

    b. Changes identified through the PDW will be administered similarly to Design-Builder Initiated Changes, with the savings to be shared between the parties. The process is similar to a Value Engineering (VE) Change Proposal process.

    Potential disadvantages with WSDOT's post-award approach are that PD ideas are only offered by the successful proposer and not competed as part of procurement process. Also, WSDOT must share in the savings realized by a PD after award.

10. WSDOT is adding language to its proposal process encouraging the design-builder to pursue PD. It is our understanding that, as part of the procurement process, WSDOT is considering asking proposers to identify PD ideas that will provide cost/schedule savings during procurement, and awarding technical credits based on the PD ideas brought forward. After award, WSDOT will then evaluate all the PD ideas submitted during the RFP process for incorporation into the work.

    In the future, WSDOT is also considering asking for ATCs during procurement that provide for cost-savings if the "equal or better" concept is met or equal performance can be demonstrated.

5.3 Gap Analysis: Project Development

	Leading Practices	WSDOT's Alignment with Leading Practices	What is WSDOT doing well?	What are the gaps/risks with WSDOT's current practice?	Recommendations
Scoping, Preliminary Investigation,& Engineering	Standard guidance is provided to address the project development process for DB projects, and the appropriate level of design based on project goals, risk allocation, and procurement approach.	**Partial alignment** WSDOT currently lacks standard guidance that the regions/programs can use to develop appropriate scopes and contract packaging for DB projects. However, the proposed table of contents for the updated DB manual indicates that guidance will be included to address how the project development process differs for DB versus DBB projects.	WSDOT staff, as they have become more experienced with DB, have to come to generally recognize basic differences in the project development process for DB vs. DBB.	There is considerable latitude in how the Regions can modify the standard project development process for DB, which can lead to: • Inconsistency in how DB projects are developed and scoped • The level of design not matching what is needed for the project • Change orders stemming from inadequate scoping or preliminary investigation • DB mega-projects may present management challenges, more risk, and restrict industry competition	Develop guidance, to be included in the DB Manual and the formalized training program, to address the scope development process for DB projects. Carefully consider contract packaging for DB from cost, schedule, community impact, DB market, and other perspectives. Smaller DB projects can alleviate funding limitations, and stimulate more competition from local industry
Performance Specifications	Use performance specifications to provide the greatest opportunity for contractor flexibility, particularly when innovation is a project goal.	**Partial alignment** WSDOT lacks sufficient guidance and training regarding the effective use of performance requirements for DB projects. WSDOT (as well as other DOTs) often use fairly prescriptive specifications to satisfy environmental requirements and to accommodate project constraints or third party (or joint jurisdictional) issues.	Recognizing that its requirements are fairly prescriptive, WSDOT uses a robust ATC process to obtain contractor innovation.	WSDOT currently uses relatively prescriptive specifications for its DB projects. For example, Book 2 of a typical WSDOT solicitation package prescribes a list of Mandatory Standards for each work element that design-builders must adhere to in developing their designs. Incorporation of such standards into the DB contract can: • Significantly restrict contractor innovation • Require use of a prolonged and resource-intensive ATC process to allow for design deviations and foster contractor innovation	Develop guidance, to be included in the DB Manual and the formalized training program, to help project teams make informed and conscious decisions regarding the use of performance versus prescriptive specifications. For example, see SHRP2 R07 Performance Specifications Implementation Guidelines.

	Leading Practices	WSDOT's Alignment with Leading Practices	What is WSDOT doing well?	What are the gaps/risks with WSDOT's current practice?	Recommendations
Practical Design	Agencies are developing standard processes and guidance to address how to adapt PD to a DB project. This often entails integrating PD into the procurement process by encouraging proposers to submit ATCs that take advantage of cost-saving PD ideas.	**Partial alignment** WSDOT currently lacks a clear strategy for seamlessly integrating PD into the delivery of a DB project.	WSDOT appears to be carefully considering various options to determine the best way to apply PD to DB projects.	Potential disadvantages with the post-award approach to PD that WSDOT is piloting include: • PD ideas are limited to those offered by the successful proposer and are not competed as part of procurement process • WSDOT must share in the savings realized by a PD after award	• Develop guidance, to be included in the DB Manual and the formalized training program, to address how to adapt PD to a DB project. • Consider evaluating PD concepts prior to and as part of the procurement phase.

5.4 Recommendations on Project Development

Based on the observations and risks identified above, the consultant team offers the following recommendations:

1. **Take advantage of Practical Design (PD) for DB projects in all phases of design development (which may include Phase 1 - Project Inception to Basis of Design (BOD), Phase 2 - Procurement, and Phase 3 - Post-award).** To more effectively implement PD for DB projects, we recommend that WSDOT evaluate PD concepts as part of the preliminary design and scoping phase and during the procurement phase.

   The WSDOT Design Manual M 22-01.12 dated November 2015 addressing PD states that:

   > *Practical Design can be applied at all phases of project development, but is most effective at the scoping level or earlier where key decisions are made as to what design controls and elements are affected by alternatives, and how they can best be configured to meet the project and contextual needs.*

   WSDOT should consider adding PD to the RFP process, inviting proposers to identify PD ideas and potential cost/schedule savings that do not compromise the project purpose and need. WSDOT could award technical credits for the ideas and bring them forward in Phase 3 as part of a 30-day Practical Design Workshop similar to a VE process. Alternatively, WSDOT could consider developing PD guidance to allow cost-saving ATCs in place of standard designs.

   To implement PD during preliminary design or procurement would require revising the current language in RCW 47.01.480 (1) (c) (House Bill 2012, 2015 session) addressing PD that states:

   > *For Design-Build projects, the evaluation must occur* ***at the completion of thirty percent design****.* (emphasis added)

2. **Develop guidance and training to address project development processes for DB projects.** To expand upon Recommendation No. 2 in Section 3.4, regarding the development of an updated DB Manual, guidance should be developed to allow project teams to make informed and deliberate decisions regarding topics such as:

   - Goal setting and prioritization, which will later help the project team make informed decisions regarding:
     - Proposal evaluation criteria for inclusion in solicitation documents and subsequent award decisions, and
     - Appropriate response strategies should issues arise during project execution.
   - Careful consideration of contract packaging for DB from cost, schedule, community impact, DB market, and other perspectives (as smaller DB projects can alleviate funding limitations, and stimulate more competition from local industry);

- The level of pre-design investigation, scoping, and design development work needed given the project goals, risks, and procurement approach;

- Best practices for performance specifying, including when to use or not to use performance criteria, and how to coordinate criteria with standard design manuals and other reference materials; and

- Whether change order requests represent actual changes from the original scope (or are simply the result of design evolution allowed for in the contract documents).

3. **Consider expanding the use of performance specifications.** The technical requirements included in Book 2 of WSDOT's current DB procurement templates generally refer to mandatory prescriptive standards (e.g., design, materials, construction manuals, standard specifications) for various design elements.

   If WSDOT intends to allow the design-builder more flexibility through the use of performance specifications, the referenced standards should be reviewed to identify any potential conflicts. It may then be necessary to articulate in the solicitation documents where WSDOT would consider alternative solutions or options to what is mandated in the referenced standards (but which would meet the performance criteria).

4. **Perform appropriate levels of front-end investigation and design.** The necessary level of front-end investigation and design (i.e. scoping definition) will largely depend on project goals and the intended risk allocation strategy established for the project.

   For complex or high-risk projects, WSDOT's risk management process (CRA/CVEP) should evaluate, as possible risk analysis scenarios, the impact of performing varying levels of investigation and design before starting the procurement phase. The results of the risk assessment could then be used to inform the internal budget and schedule to allow for the appropriate level of front-end subsurface, utility, or other site investigative work required to effectively define the scope of work within an acceptable level of risk. The higher the risk rating, the more resources that should be applied to front-end investigation.

6. Delivery Method Selection

6.1 Leading Practices

No single delivery method is appropriate for *all* projects and situations. For any given project, a key early decision in the project development process therefore entails selecting the *optimal* delivery approach based on project characteristics, goals, risks, and constraints.

Practices used by organizations with successful DB programs to assist with the delivery decision include the following:

Best Practices in Delivery Method Selection

- Fostering of an organization-wide understanding of the potential benefits, limitations, and attributes of various delivery methods;
- Flexibility for project teams to select a delivery strategy (e.g., DBB, DB, GC/CM, etc.) that best aligns with the project's characteristics, goals and needs while minimizing costs and risks;
- Early identification of the delivery method of choice to ensure the level of project design and development aligns with the delivery method chosen;
- Implementation of guidelines that clearly identify how the project delivery decision integrates into the organization's traditional project development process, including processes that address:
  - When the delivery method decision is to be made,
  - Who has final accountability for the decision, and
  - How the decision is to be documented to effectively communicate and provide an auditable trail of how the delivery decision was made.
- Use of lessons-learned on past projects to inform future delivery method decision-making.

6.2 Observations

In the context of the best practices identified above, the consultant team observes the following:

Decision Process

1. As discussed in Chapter 2, both DBB and DB hold advantages and disadvantages that should be carefully weighed when considering how to best deliver a particular project. In support of this observation, all of the peer agencies interviewed acknowledged the following:
   - DB is not appropriate for all projects.
   - Key drivers behind the decision to use DB include a need or desire to:

- Expedite the delivery schedule
- Encourage industry innovation
- Improve risk allocation
- Obligate funds for the entire project

- The decision as to which delivery approach best aligns with a given project's characteristics, goals, risks, and constraints should be made relatively early on in the project development process.

Common considerations included in decision support processes include:

- Project delivery schedule
- Project complexity
- Design flexibiltiy and/or opportunities for innovation
- Level of design needed to clearly define the DB scope and requirements
- Staff experience and availability to execute the project delivery methods under consideration
- Competition and contractor experience

2. To support the delivery method decision, several DOTs have developed systematic processes or tools that align project goals and characteristics with the attributes of a given delivery method (e.g., DBB, DB and its variants, GC/CM, etc.).

    a. Of the peer agencies interviewed, CDOT, MDSHA, MnDOT, and Ontario have implemented formal decision tools modeled after the Project Delivery Selection Matrix (PDSM) developed for FHWA's Transportation Pooled-Fund Study, TPF-5(260).

    b. Such processes generally entail considering a project's goals and constraints and then evaluating the opportunities and challenges associated with each delivery method under consideration.

    c. Using such a formal and structured approach can lend transparency and consistency to the decision process – a key benefit that some of the peer agencies noted was particularly useful for justifying the delivery decision to executive leadership and other stakeholders, including the public.

3. The remaining agencies interviewed, which formed the majority of our peer group, use less systematic processes to make their project delivery decisions, but have nonetheless established guidance or criteria for appropriate and/or inappropriate application of DB.

    a. Such screening criteria have generally been informed by each DOT's past experience with DB and the other delivery methods under consideration.

    b. Prior to finalizing the decision, a risk workshop may also be performed to ensure that the delivery method aligns with the risk allocation strategy selected for the project.

The agencies that use more informal decision processes include FDOT, NCDOT, and ODOT, whose DB programs are among the oldest and most active in the United States.

This finding suggests that as the use of DB becomes more ingrained in the culture of an organization, less deliberation and formal justification may be needed to support the decision to use DB on a particular project.

4. WSDOT has recently developed a formal and scalable decision process similar to those used by the agencies described in Observation No. 2 above. Prior to the development of this decision tool, which WSDOT refers to as the Project Delivery Method Selection Guidance (PDMSG), all projects were pursued using DBB unless the Region/program specifically requested approval for DB.

    a. WSDOT collaborated with the Association of General Contractors (AGC) of Washington and the American Council of Engineering Companies (ACEC) to adapt the PDSM used by Colorado DOT to suit its own programmatic needs, policies, and values.

    b. Consistent with best practice, the selection decision is fully integrated into WSDOT's overall project development phase. All projects are evaluated in two steps:

- The Probable Project Delivery Method (PDM) is determined during the Project Definition Phase.

- The Final PDM is then determined after validating (and updating or revising as necessary) the Probable PDM sometime between the Project Planning and Endorsement Phase and Geometric Review (i.e., 10 to 30% design).

c. The PDMSG provides built-in scalability to streamline the selection process for simple projects that do not require significant deliberation to identify the optimal delivery method. In this respect, WSDOT's PDMSG provides an effective and efficient balance between the formal and systematic processes described in Observation No. 2 above and the more simple screening criteria discussed in Observation No. 3.

- The Selection Checklist provides the ability to quickly identify projects suited for DBB as well as to eliminate GC/CM.

- If the Selection Checklist does not determine a Probable PDM or if the project is $25 million or more, a more robust decision matrix (i.e., the "Selection Matrix") can be used. All projects with costs of $100 million or greater must also undergo a selection Workshop.

Timing of the Decision

Due to late delivery decisions in the past, WSDOT has procured DB services using designs that were much more developed and prescriptive than what is normally considered appropriate for DB.

5. Based on some of the projects reviewed, past decisions to use DB were often made after designs had already been advanced beyond what would be considered ideal or appropriate for obtaining the full benefits of DB. For example, the design for US 2/Rice Road was almost complete when the decision was made to include it as part of the DB small projects program. This required the design team to restructure the design documents to make them more suitable for DB. It also caused some confusion for the design-builder who did not initially recognize that some of the completed designs still had to be revised, stamped, and resubmitted by the design-builder.

6. Adherence to the PDMSG, which provides detailed guidance on how to integrate the delivery method decision into the overall project development process, should prevent the recurrence of similar situations.

6.3 Gap Analysis: Delivery Method Selection

	Leading Practices	WSDOT's Alignment with Leading Practices	What is WSDOT doing well?	What are the gaps/risks with WSDOT's current practice?	Recommendations
Project Delivery Method (PDM) Selection	A standard process is in place that is designed to: • Ensure consistent PDM decision-making, and • Establish an auditable trail documenting why a particular method was chosen and how it aligns with the project goals.	**Full alignment** WSDOT recently implemented a formal decision tool to assist with project delivery method selection. This process, referred to as the Project Delivery Method Selection Guidance (PDMSG), provides a scalable and systematic process for identifying the appropriate delivery method based on a given project's attributes, opportunities, and risks.	• WSDOT worked with industry to tailor a selection process to suit its programmatic and stakeholder needs. • The PDMSG recognizes that as the project becomes more defined, new information may impact the original delivery decision. The process thus entails two steps: Determination of the Probable PDM followed by validation or revision of this Probable PDM as preliminary design work advances.	No apparent gaps.	• Evaluate the effectiveness of the PDMSG as DB projects are executed and completed, and adjust as needed based on lessons-learned and feedback from project managers and industry. • Include guidance in the DB Manual that discusses the PDMSG and how it integrates with the overall DB project development process.
Timing of the Delivery Decision	The delivery decision should be made earlier enough in the project development process to ensure the level of project design and development aligns with the method chosen.	**Full alignment** With the development of the PDMSG, WSDOT now has detailed guidance identifying when the delivery decision should be made.	Recognizing the problems that delayed decision-making caused on past projects, WSDOT incorporated clear instructions in the PDMSG identifying how the delivery decision should integrate with various existing phases of project development.	In the past, delayed delivery decisions resulted in WSDOT not receiving all of the potential benefits of DB and perhaps also adversely impacted cost and schedule. Adherence to the PDMSG should prevent such risks associated with late decision-making on future projects.	Monitor the effectiveness of the timing of the delivery decision, and adjust guidance as needed based on lessons-learned and feedback from project managers and industry.

6.4 Recommendations on Delivery Method Selection

Based on the observations and risks identified above, the consultant team offers the following recommendations:

1. **Experiment with alternative DB delivery strategies that improve the efficiency of delivery for high risk, complex projects and smaller projects.** Alternative delivery strategies for high risk or complex projects could include progressive DB. Progressive DB is a method, similar to GC/CM, where the design-builder will perform preliminary services to develop the preliminary design and a guaranteed maximum price/lump sum price. In contrast to GC/CM, the design-builder has single point responsibility for design and construction

   Alternative delivery strategies for smaller projects could include bundling or multiple award task order contracts. Bundling projects under a single DB contract can accelerate delivery and achieve efficiencies in procurement, design, environmental permitting, and construction sequencing, and help obtain overall time savings, if the projects to be bundled are carefully selected. Decision criteria identified by some of the peer agencies who have successfully bundled projects include:

   - Are the projects small, non-complex, or low risk?
   - Do the projects entail similar work elements?
   - Are they located in reasonable proximity to one another?
   - Can efficiencies be obtained in design, quality management, mobilization, etc.?
   - Are minimal external agency reviews required?

   If alternative strategies prove successful, the PDSMG process should be refined accordingly to incorporate criteria for these delivery options.

2. **Consider DB project performance and lessons-learned, and refine the PDMSG as appropriate.** Expanding upon Recommendation No. 5 in Section 3.4 regarding performance monitoring, as a lesson-learned activity on future DB and other projects, an assessment should be conducted to determine if the chosen delivery method using the PDMSG was appropriate. One approach could be to re-score the PDMSG matrix and compare the results with the original PDMSG matrix. Feedback from such assessments can be used in the long-term to identify any necessary changes or enhancements to the PDMSG.

Applications for bundled DB project could include:

- Statewide small or low impact bridge rehabilitation/replacements,
- Selected fish passage culverts in geographic proximity, or
- Projects lcoated near each other, for which efficiency can be gained by one contractor mobilizing for multiple projects.

7. Procurement

7.1 Leading Practices

To promote programmatic consistency, many organizations have adopted standard procurement processes designed to:

- Enhance cost and schedule efficiencies,
- Reduce administrative burden,
- Maximize participation by the contracting community; and
- Enhance the objectivity, fairness, and transparency of the award decision.

General characteristics of well-designed procurement processes used by DOTs with mature DB programs to achieve these objectives include the following:

Best Practices in Procurement

- Flexibility to select a procurement method (e.g., low bid, best value) that aligns with the project goals and enhances the objectives of using DB;
- Use of appropriate project-specific evaluation criteria that align with project goals and risks, and provide for a meaningful evaluation of proposers while not being overly burdensome;
- Use of evaluation factors and award algorithms that clearly differentiate between proposers and enhance the objectivity, fairness, and transparency of the evaluation process;
- Consideration of current market conditions to identify any procurement actions that could limit or expand competition (e.g., bundling smaller projects together where logical based on location, type of work, funding source, etc.);
- Selection of personnel to evaluate proposals that are knowledgeable about the procurement process, unbiased, and committed to performing their evaluation in a manner consistent with the philosophy and methodology described in the solicitation documents and evaluation plan;
- Shortlisting of the number of proposers invited to submit proposals when using a two-step best value process;
- Consideration of ATCs and use of confidential one-on-one meetings to encourage the open and candid exchange of concepts, concerns, and ideas; and
- Payment of reasonable stipends to unsuccessful but responsive proposers.

7.2 Observations

In the context of the practices identified above, the consultant team observes the following:

Procurement Options

1. Several of the DOTs with more mature DB programs have the ability to procure DB projects in different ways based on project types or characteristics. Such differences are in keeping with the FHWA Final Rule on Design-Build Contracting, which grants agencies broad discretion in selecting a procurement approach appropriate for the specific needs of a given program or project.

2. The most common distinction seen in commonly used procurement strategies for transportation construction is between a low bid DB process and a best-value DB process. This distinction and defining characteristics are briefly summarized in Table 7.1.

Table 7.1: Comparison of Low Bid and Best-Value Procurement

	Low Bid Design-Build	Best Value Design-Build
Description	Selection of design-builder based on lowest price	Selection of the design-builder based on price and other factors including qualifications, experience, and technical solutions
Rationale	• Streamline procurement • Time-savings	• Encourage industry innovation to get better designs, constructability, or enhancements resulting in cost or time savings • Select the best qualified team
Applicability	Smaller projects, with less flexibility or room for innovation	Larger, more complex projects with more flexibility or opportunity for innovation
Process	Submission of separate pricing and qualifications packages, followed by selection of the lowest priced offeror (meeting the qualification requirements)	Most often implemented as a two-step process: • Phase 1 - submission of a qualifications package, followed by evaluation and shortlisting 3 to 5 proposers • Phase 2 - submission of separate technical and cost proposals, followed by evaluation and selection of the design-builder offering the best value in terms of cost and other factors

3. With this basic distinction between low bid and best value in mind, some of the more mature DOTs have the flexibility to use different procurement strategies to meet the unique needs of a given project. For example, as shown in Table 7.2, most of the transportation agencies interviewed have the ability to use (and have in fact used) both a two-step best value process and more streamlined procurement options (e.g., one-step best value, or one or two-step low bid) to procure DB services. Flexibility with regard to procurement options is perceived by such agencies to be beneficial in that it allows them to tailor the procurement effort to the project type and objectives in the interest of saving cost, time, and effort.

Table 7.2: Summary of DOT Experience with Different Procurement Strategies

State	Low Bid Design-Build	Best Value Design-Build
Washington	X	X
Colorado(1)		X
Florida	X	X
Maryland	X	X
Minnesota	X	X
Missouri(2)		X
North Carolina	X	X
Ohio	X	X
Oregon	X	X
MTO	X	X
Texas(3)		X
Utah	X	X
Virginia	X	X

(1) CDOT used the low bid DB approach once but does not plan to use it again.

(2) For MoDOT, industry innovation is the clear driver for using DB, and thus best value options are the most appropriate.

(3) TxDOT primarily uses DB on very large or mega projects, for which low bid options would not be desirable.

4. WSDOT primarily procures DB services using a two-step best-value approach. While consistent with DBIA best practice, a two-step best value approach may be overly burdensome and not beneficial for smaller projects where innovation or creativity are not sought.

5. Feedback provided by industry representatives supports the need for more flexibility in WSDOT's procurement options.

    a. Industry respondents generally agree that WSDOT's current procurement process for DB (particularly a two-step process, where proposers are short-listed and are then required to submit technical proposals in phase two) can be burdensome, requiring significant effort to prepare technical submissions that are not fully compensated for in the stipends offered.

    b. To pursue a more involved best-value DB procurement, industry participants noted that the opportunity would have to be both large enough to justify the effort needed to respond and sufficiently open and non-prescriptive to provide the potential for innovation (and thereby allow the team to differentiate itself from other proposers).

    c. By way of example, one industry representative noted that greenfield projects, such as highway or bridge projects on new alignments, offer the greatest opportunity for creativity and cost and time savings, and thus are good candidates for best value. In contrast, an interstate widening

Several DOTs with mature DB programs tailor the procurement process to project-specific conditions and goals. This generally entails use of:

- A two-step best value process when innovation is sought, and
- More streamlined solicitation processes (e.g., one-step or low bid processes) for simple or small projects having clearly defined scopes of work for which limited innovation is sought (i.e., time savings is the primary driver).

project for which the DOT is looking primarily for time savings, not innovation, would be a better candidate for a low-bid process.

DB for Small Projects

NCDOT touted the ability of small project DB to allow firms with less DB experience to participate, which ultimately helps expands the pool of qualified DB contractors and designers.

6. WSDOT is beginning to expand the use of DB to smaller projects, which, based on the experience of other DOTs, should help grow the DB industry in Washington State by expanding opportunities for smaller firms to prime projects. However, in contrast to how other agencies have executed small DB projects, WSDOT has not adjusted or streamlined its procurement practices to align better with project characteristics and goals.

7. Several of the peer agencies (e.g., Maryland, Minnesota, Missouri, North Carolina and Oregon) have also had success bundling projects (e.g. small bridge rehabilitation) under a single DB contract to accelerate delivery and achieve efficiencies in design, environmental permitting, and construction sequencing. Lessons-learned from the experience of these agencies with bundling include the following:

    a. Allocation of funding can make multi-year bundled contracts difficult.

    b. Bundling can help deliver projects that would have been too small to otherwise attract adequate competition.

    c. Bundling is effective for projects that have similar work, are geographically close together, and require minimal external agency review.

Evaluation and Selection Processes

Common concerns with WSDOT's DB procurement processes as expressed by industry include:

- Perceived subjectivity of evaluation and selection process
- Cost of preparing technical proposals and the value of stipends for shortlisted firms
- The size of DB projects limiting the ability of smaller contractors to participate in DB and challenges regarding teaming.

8. WSDOT does not have any guidance or standardized processes to assist project teams with identifying appropriate project-specific evaluation criteria and proposal deliverables that align with project goals and risks. For example, although a common goal of DB projects is to encourage contractor innovation, WSDOT often applies evaluation criteria that are heavily weighted towards price (i.e. 90% price / 10% technical). Such weightings have not always provided for meaningful distinctions among proposers (aside from price). However, it should be noted that some WSDOT DB projects have been awarded to the proposer that did not have the lowest price.

9. Use of a more qualifications-focused procurement process on certain projects may have allowed WSDOT to achieve better results on certain projects. For example,

    - On the I-5 et al. Active Traffic Management System project, a more non-price technically focused procurement process could have led to the selection of a more qualified and innovative design-builder. According to the Project Engineer, a large discrepancy in price proposals led to selecting the team that was least able to deliver innovation.

    - On at least 2 of the 6 projects reviewed (US 2/Rice Road and SR 520), poor relationships between the DB teaming partners hampered project performance. Moving forward, the past collaboration of DB teaming partners could be a useful RFQ/RFP qualifications criterion.

10. WSDOT does not appear to have standard guidance or training on the proposal evaluation process, which could allow favoritism to influence selection results. WSDOT should include guidance in the DB manual to address proper evaluation

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procedures, develop project-specific evaluation plans and train evaluators on the importance of impartial selections.

11. Consistent with best practice, WSDOT routinely shortlists the number of proposers invited to submit a phase 2 technical proposal. By winnowing down to the highest qualified proposers, the proposers are encouraged to invest resources to develop innovative approaches to design and construction, and WSDOT can focus its efforts on selecting the firm offering the best value (i.e. combination of price and technical solutions).

Alternative Technical Concepts

12. To promote innovation, WSDOT routinely encourages proposers to submit Alternative Technical Concepts (ATCs) that are equal to or better than the base design requirements.

    a. An ATC is a request by a proposer to modify a contract requirement, specifically for that proposer's use in gaining a competitive benefit during the proposal process.

    b. Consistent with DBIA, WSDOT's philosophy is to evaluate ATCs based on obtaining equal or better value without consideration of cost savings. In contrast to this practice, several DOTs evaluate cost savings as well.

FHWA promotes the ATC process as being an effective means to encourage industry innovations that will:

- Incorporate construction efficiencies,
- Reduce risks,
- Accelerate schedules, and/or
- Reduce project costs.

13. Most of the agencies interviewed reported that the use of ATCs during the procurement process has been a powerful and key source of innovation or cost savings, particularly for more complicated projects.

14. Several of the agencies also noted that reviewing ATCs can be a time consuming process that may require significant resources and effort. Strategies used by some agencies to streamline the ATC process include the following:

    - Capping the number of ATCs proposers may submit (so as to discourage the submittal of unnecessary ATCs that seek only to clarify that a concept is allowable under the base requirements);
    - Defining pre-approved exceptions to design standards; and/or
    - Restricting ATCs to certain project elements (e.g., some agencies do not allow ATCs for pavement design, or items that will affect third party agreements).

Most agencies (including WSDOT) report that the use of ATCs during the procurement process has been a powerful and key source of innovation or cost savings, particularly for more complicated projects.

15. The industry representatives who were interviewed also viewed the ATC process favorably, noting that ATCs can help distinguish their proposal from those of other DB teams.

    However, for the ATC process to be effective, industry stressed that the DOT must be open to allowing changes in specification requirements in order to support innovation.

One-on-One Meetings

16. One-on-one meetings are confidential meetings held during the procurement process between proposing DB teams and agency staff.

17. All of the agencies interviewed considered such meetings to be a key communication tool that helped to:

- Encourage the open and candid exchange of concepts, concerns, and ideas.

- Ensure that the agency's project needs are being appropriately and consistently interpreted by all proposers.

WSDOT staff further noted that the collaborative environment fostered through such meetings often carries through to the post-award design and construction phase of the project, helping to build rapport and promote trust, equity, and a commitment to project success among the contracting parties.

18. Confidential meetings also often form an integral part of the ATC process, as proposers and agency staff meet to clarify and discuss ATCs.

    a. WSDOT staff indicated that they allocate 1 to 1.5 hours per week to each proposing team during the procurement process to provide proposers with the opportunity to vet ideas with DOT staff. This may amount to 3 to 5 hours per week for ATC-related meetings during the procurement phase (which may extend anywhere from one to several months).

    b. WSDOT staff touted the usefulness of these weekly meetings for:

        - Working out any kinks in the solicitation documents.

        - Nurturing a relationship with proposers that would ideally carry through to the post-award design and construction phase.

    c. The other agencies interviewed similarly placed high value on holding one-on-one meetings, but also stressed that there was a need to effectively manage the time expended on the ATC effort by both their own staff and the proposing teams.

Stipends

WSDOT routinely offers reasonable stipends to shortlisted proposers. Such stipends are an essential tool to stimulate competition and motivate the industry to innovate.

19. To encourage competition and motivate the industry to innovate, WSDOT routinely offers reasonable stipends consistent with industry best practice that compensates shortlisted proposers that have submitted responsive technical proposals.

20. Transportation agencies generally award stipends to shortlisted proposers as a percentage of the contract value (e.g. 0.1% to 0.5%). In response to industry concerns and pushback that stipend amounts are insufficient, and to motivate industry to submit better proposals, some DOTs are moving towards increasing stipend amounts where larger proposal efforts are required.

7.3 Gap Analysis: Procurement

	Leading Practices	WSDOT's Alignment with Leading Practices	What is WSDOT doing well?	What are the gaps/risks with WSDOT's current practice?	Recommendations
Procurement Strategy	Well-designed procurement processes: • Entrust project teams to evaluate available procurement options (e.g., one vs. two-step processes; low bid vs. best value) against the circumstances of each project to make informed and strategic procurement decisions. • Focus on the qualifications of DB teams (including the demonstrated history of how the teaming partners have successfully collaborated on prior projects), • Encourage the use of appropriate project-specific evaluation criteria that align with project goals and risks, and provide for a meaningful evaluation of proposers while not being overly burdensome.	**Partial alignment** Based on its current practice, WSDOT uses a two-step best value procurement process for all DB projects. *(In contrast, several DOTs with mature DB programs actively consider other options to determine the optimal procurement approach given project-specific conditions.)*	Consistent with DBIA best practice, WSDOT routinely uses a two-step best value process that entails selecting short-listed firms on the basis of price and technical factors.	For certain projects, the requirement to use a two-step best value procurement process may: • Result in an overly burdensome and time-consuming solicitation phase • Unnecessarily restrict competition	• Develop policies and procedures related to the use of more streamlined procurement options. • Develop guidance (perhaps incorporated into the PDMSG) to help project teams determine the most appropriate procurement strategy for a particular project.

	Leading Practices	WSDOT's Alignment with Leading Practices	What is WSDOT doing well?	What are the gaps/risks with WSDOT's current practice?	Recommendations
Evaluation Criteria	Formal processes or procedures exist to guide project teams in the selection of evaluation criteria and associated weightings that: • Closely align with project goals and risks, and that will • Reveal clear differences among proposers And will <u>not</u>: • Require an unreasonable level of effort on the part of proposers to respond • Unnecessarily duplicate information already sought during the first phase of a two phase procurement process	**Partial Alignment** It does not appear that WSDOT has any guidance or standardized processes to assist project teams with identifying appropriate project-specific evaluation criteria and deliverables that align with project goals and risks.	WSDOT's solicitation documents do not appear to ask proposers to provide an unreasonable level of detail in their technical proposals.	In the absence of guidance or standardized processes to assist project teams with identifying appropriate project-specific evaluation criteria, • Teams may rely on criteria used in past solicitation documents (which may not be indicative of the risks and goals of the current project). • The evaluation criteria and associated weightings may not provide for meaningful distinctions among proposers.	• Develop repeatable procurement guidance in the DB manual to carefully identify and weight key evaluation criteria that closely align with project goals and risks. • For high risk or technically challenging projects, include technical criteria (e.g., geotechnical, utilities, design features) with higher weightings for technical factors (i.e. 75% price/25% technical) based on the prioritization of project goals and risks and adjust other factors (i.e. stipends) accordingly.
Objectivity in Evaluating Proposals	For best-value procurements, an objective and impartial evaluation of proposals is performed by personnel who are committed to performing their evaluations in an unbiased manner, consistent with the philosophy and methodology described in the solicitation documents and project-specific evaluation plans.	**Partial alignment** WSDOT does not appear to have standard guidance or training on the evaluation process.	For past projects, WSDOT has developed Proposal Evaluation Manuals to help evaluators with the selection decision.	For best value selections, without a comprehensive proposal evaluation plan and training of evaluators, favoritism could influence selection results (whether intentionally or not).	• Include guidance in the DB Manual to address proper evaluation procedures. • For all best value procurements, develop project-specific evaluation plans and standard scoring forms. • Train evaluators on the importance of impartial selections.
Shortlisting	Shortlist the number of proposers invited to submit proposals for a two-step process.	**Full alignment** WSDOT routinely targets shortlisting to 3-4 proposers.	WSDOT is in full alignment with best practice.	Short-listing for smaller, non-complex projects may unnecessarily restrict competition.	For smaller projects, consider expanding the short-list to broaden the reach of DB and allow more firms to gain experience

	Leading Practices	WSDOT's Alignment with Leading Practices	What is WSDOT doing well?	What are the gaps/risks with WSDOT's current practice?	Recommendations
Alternative Technical Concepts (ATCs)	Encourage proposers to submit ATCs as a means to obtain innovation.	**Full alignment** WSDOT routinely encourages proposers to submit ATCs. *(Consistent with DBIA, WSDOT's philosophy is to evaluate ATCs based on obtaining equal or better value without consideration of cost savings. In contrast to this practice, several DOTs evaluate cost savings as well.)*	WSDOT is in full alignment with best practice.	Because WSDOT's approach to ATCs does not address cost savings, and Practical Design is implemented as a post-award strategy for DB, the opportunity to realize cost-savings during the DB procurement phase is limited.	Develop and maintain a database of commonly submitted and approved ATCs, which could be used to help streamline the approval process and/or to identify trends that could be used to relax design standards or specification requirements.
Confidential One-on-one Meetings	Use one-on-one meetings with proposers to encourage the open and candid exchange of concepts, concerns, and ideas.	**Full alignment** WSDOT routinely engages proposers in one-on-one meetings as part of the ATC process.	WSDOT is in full alignment with best practice.	WSDOT appears to have more frequent confidential meetings than other DOTs, which can create a stress point in administering the procurement.	• Optimize the efficiency of one-on-one meetings. Account for the significant effort associated with conducting these meetings on the part of DOT staff when planning procurement staffing needs and determining the number of firms to shortlist. • For one-on-one meetings, keep WSDOT participating staff small; and limit consultant support to ensure the strictest confidentiality.
Stipends	Offer a reasonable stipend to unsuccessful shortlisted proposers when the proposal preparation requires a significant level of effort.	**Full alignment** WSDOT routinely offers stipends in a range (i.e., 0.1 - 0.3% of the estimated project costs) that is consistent with stipends offered by the majority of DOTs with DB programs.	WSDOT is in full alignment with best practice.	If industry perceives stipends to be insufficient, • The project may encounter difficulty attracting interest. • WSDOT may not receive good proposals.	Develop guidance, for inclusion in the DB manual, to guide project teams in the determination of an appropriate stipend amount. For example, a higher stipend may be warranted for complex, high risk projects for which WSDOT is asking for a greater proposal effort (i.e. more technical detail).

7.4 Recommendations on Procurement

Based on the observations and risks identified above, the consultant team offers the following recommendations and implementation strategies:

If WSDOT continues to expand the use of DB to smaller, less complex projects, more streamlined DB procurement options, including low bid DB and bundling of multiple projects, may help achieve efficiencies in project development and procurement.

1. **Consider streamlining the procurement process for smaller or non-complex projects.** To implement different procurement options, many DOTs develop guidance and separate contract templates that reflect the streamlined process. For example, a one-step procurement process would entail:

    - Eliminating the Request for Qualifications (RFQ) and shortlisting step;
    - Adjusting the ad period to 6 to 10 weeks;
    - Possibly foregoing the use of ATCs and stipends; and
    - Selecting based on the lowest price for proposers that meet responsiveness requirements.

    The responsiveness check may include pass/fail or scored criteria including qualifications and experience, and technical ability.

    Alternatively, if a two-step process is used for smaller projects, adjust the Request for Qualifications (RFQ) by incorporating more pass/fail criteria or lowering the thresholds for experience and past performance.

2. **Refine evaluation criteria for the two-step best value process.** WSDOT currently uses a two-step best-value process where the evaluation criteria tend to be weighted towards price (i.e. 90% price /10% technical).

    Possible refinements to this process include the following:

    - For high risk or technically challenging projects, consider including technical criteria (i.e. geotechnical, utilities, design features) with higher weightings (i.e. 75% price/25% technical) based on the prioritization of project goals and risks.
    - Consider prior working relationships of DB teaming partners as a qualifications criterion.
    - To help grow the DB industry and to allow proposers with less experience to compete for small or simple projects, consider expanding the short list and/or using more pass/fail criteria (or lower thresholds for experience and past performance) for key personnel qualifications.

    To finalize procurement policies, conduct workshops or other forums with senior staff and industry partners. Based on this dialog, develop guidance for inclusion in the updated DB manual to assist project teams with identifying and weighting key evaluation criteria that align with project goals and risks and that will help differentiate proposers.

3. **Refine the processes for ATCs and one-on-one meetings.** Protocols for one-on-one meetings should be set forth in the DB Manual. Some DOTs prohibit members of the project proposal evaluation team from participating in proprietary

ATC meetings, citing the need to prevent the appearance of bias or a conflict of interest. Safeguards such as non-disclosure agreements or restrictions on DOT or consultant personnel participation will promote sharing innovative ideas and increase the number and quality of ATCs.

The current WSDOT Instructions to Proposers template addresses submittal and review of ATCs, and the DB Manual also provides guidance for the use of ATCs. Both documents address the concept of "equal or better" as the standard for acceptance of an ATC. The guidelines should also note that the solicitation documents should define areas where ATCs are allowed and where they are not allowed (e.g., some DOTs do not allow ATCs for pavement design, or impacts to third party agreements).

4. **Establish a database of ATCs and refine ATC process and standard manuals accordingly.** The current WSDOT documents require that design deviations must be approved before being incorporated into any ATC. Given that ATCs quite often involve designs that deviate from DOT design standards, some DOTs have developed pre-approved exceptions to design standards to streamline the approval process.

   Developing and maintaining a database of commonly submitted and approved ATCs by category (e.g., materials, geometrics, bridge, traffic, walls, drainage, paving, geotechnical, etc.) could be used to:

   - Expedite the evaluation of ATCs for specific projects.
   - Identify appropriate pre-approved exceptions for inclusion in solicitation documents.
   - Revise the current design standards for DB projects as appropriate to allow for more flexibility and greater use of performance specifications.

5. **Ensure objective evaluation of proposals.** Guidance and training should be developed to ensure proposal evaluators do not introduce bias or favoritism into the evaluation process. To help ensure the objectivity of the proposal evaluation process, owners use a variety of techniques that WSDOT may wish to consider, particularly for large or high-profile projects, such as:

   - Developing project-specific proposal evaluation plans;
   - "Blinding" technical proposals (i.e., concealing the identity of the proposers);
   - Having witnesses observe evaluation discussions and report out on any unfair or biased treatment of proposers; and
   - Providing adequate documentation to sufficiently support the ratings and scoring.

8. Cost Estimating and Budgeting

8.1 Leading Practices

Cost estimating is an integral part of the capital allocation process, as estimates are often the primary input for evaluating and prioritizing capital projects and developing annual and long-range total capital plans. Due to the importance of the budgeting and cost estimating function, owners with mature construction programs have adopted some or all of the cost estimating practices identified below:

Best Practices in Cost Estimating and Funding for DB

- Implementation of a standard cost estimating process that considers:
  - Explicitly identified risks and uncertainties to establish appropriate cost contingencies
  - Market conditions (projected labor, material and equipment availability)
  - Historical cost information to validate estimate realism
- Commitment of funding for the entire duration of a DB project, generally in advance of project approval or the start of procurement (RFQ release);
- Consideration of the best project delivery and contracting methods to meet any funding constraints; and
- Retention of historical project cost information to enhance future project development activities.

8.2 Observations

In the context of the best practices identified above, the consultant team observes the following:

Budgeting / Funding

1. Based on the experience of most DOTs, DB projects are generally fully funded before the release of solicitation documents. However,
   a. In some cases, project cash flow may be subject to limits or caps for mobilization, NEPA approval (federal funds), or cash availability schedules based on percent complete.
   b. For larger or multi-year projects, funds may be incrementally encumbered using a cash flow curve agreed upon in advance.
2. The budgeting process for the Connecting Washington funding package identified and prioritized projects in the capital program schedule over a 16-year period, which is longer than a typical DOT program cycle (i.e., a 5-year STIP).
   a. With this funding policy, it could be challenging to determine in advance how projects should be sequenced to optimally balance DOT and

industry resources (especially as the decision to use DB for given projects is made independently of the capital program budget or funding schedule).

b. WSDOT has inserted a maximum rate of payment specification into certain contracts to limit the expenditure of funds in a given fiscal year to the amount allocated to that particular project or program.

c. The Washington State Legislature does allow for adjustments to be made to the funding schedule through the annual legislative budget process.

d. Some industry representatives expressed the concern that incrementally funding a DB project could reduce the effectiveness of DB delivery by constraining the ability of the design-builder to expedite design and construction activities to their full potential.

Cost Estimating

3. Consistent with best practice, WSDOT has a rigorous yet scalable risk-based cost estimating standard that helps ensure consistency in estimate development.

4. A review of the cost data provided for WSDOT DB projects to date suggests that WSDOT estimates are conservative, and may not be reflective of market conditions for DB.

   a. A comparison of WSDOT's **Engineer's Estimate (EE) to award** or bid prices for 29 WSDOT DB projects to date indicated that on average the WSDOT DB projects resulted in a net savings, with an average award savings of approximately 17%.

   b. Table 8.1 below compares this data with that from a larger FHWA sample of 108 DB projects. As summarized in the table, all of the DB projects realized some level of award savings (i.e., negative cost growth), when the EEs are compared to the award or bid prices. For the national FHWA database, the average award savings was 5 to 7%. For the WSDOT DB projects awarded to date, the average award savings was much higher, approximately 17%.

Table 8.1: Analysis of Average Award Savings Compared to Engineers Estimate

Project Sample	Project Type	# of Projects	Average Cost Growth (%)
FHWA [1]	DB/Low Bid	37	-5%
	DB/Best Value	71	-7%
WSDOT	DB/Best Value	29	-17%

[1] Source: Preliminary Findings for FHWA DFTH61-13-C-00024

   c. Based on the above analysis, the award savings associated with the WSDOT projects is approximately 2-3 times higher on average than the larger FHWA data set. This suggests that the WSDOT estimates for DB projects are much more conservative than the national average estimates for DB, and WSDOT could benefit by examining the reasons for this difference.

d. To further explore WSDOT's DB estimates, the consultant team compared the **EEs to final payment cost** for data available from 27 WSDOT DB projects. In this comparison, WSDOT's relative savings were again higher on average than the national averages:

- For the FHWA database (with data reported for 114 DB projects), the savings (EE to final payment amount) were approximately 2% on average.
- For the WSDOT DB projects, the savings were approximately 12% on average.

Thus, even after accounting for cost growth during construction, WSDOT's EEs appear to be more conservative than those in the larger FHWA database.

Cost Performance

5. To evaluate the cost performance of WSDOT's DB program, the consultant team compared award price to final cost. WSDOT data was available for comparing **award to final payment cost**, for 24 WSDOT DB projects that have reached substantial completion. Table 8.2 summarizes the comparison of the WSDOT sample to the average cost growth from the FHWA database.

Table 8.2: Comparison of Award Cost to Final Payment Cost

Project Sample	Project Size ($M)	# of Projects	Average Cost Growth (%)
WSDOT	$0-20M	7	9%
	$20-100M	9	4.6%
	>$100M	8	9.6%
	All Projects	24	7.5%
FHWA	DB/Low Bid	36	2.8%
	DB/Best-Value	74	4.0%

a. The data in the WSDOT 24-project sample indicated that the average cost growth (award to final payment cost) was approximately 7.5%. The national average cost growth for DB projects was approximately 3.5%, slightly lower than that for the WSDOT sample.

b. Comparing actual cost growth for WSDOT DB projects, the largest DB projects (i.e. > $100M) have experienced the most significant cost growth.

c. The national database did not have a comparable breakout of cost growth data based on project value. However, it did show that on the whole, the average percent cost growth for DB is slightly less than that for DBB.

8.3 Gap Analysis: Cost Estimating and Budgeting

	Leading Practices	WSDOT's Alignment with Leading Practices	What is WSDOT doing well?	What are the gaps/risks with WSDOT's current practice?	Recommendations
Budgeting / Funding	Commitment of funding for the entire DB project duration prior to the start of procurement.	**Partial alignment** Although funding may not be committed for the entire DB project duration prior to procurement, the Legislature allows for adjustments to be made to the capital plan through the annual legislative budget process.	WSDOT is beginning to engage industry and legislative staff in discussions regarding effectively appropriating funds for DB projects.	DB industry representatives perceive that WSDOT's application of a maximum rate of payment specification could potentially constrain the ability of design-builders to expedite design and construction activities to their full potential.	• WSDOT should work with key legislators and legislative staff to ensure funds are effectively appropriated for DB projects. • Consider funding constraints when selecting the optimal project delivery method as part of the PDMSG process.
Cost Estimates	Cost estimates are developed, reviewed, and approved based on formalized standards and processes. Historical cost information is used to assist with developing realistic estimates.	**Partial alignment** WSDOT has developed a scalable and standardized process for cost estimating that should assist with the development of realistic budgets. However, comparisons of cost data with national averages suggest that WSDOT's estimates may be overly conservative.	Through its cost risk assessment (CRA)/cost estimate validation process (CEVP), WSDOT has developed rigorous yet scalable risk-based cost estimating standards that promote consistency in estimate development.	Overly conservative estimates could: • Result in inefficient budget allocation and planning • Instill a lack of urgency on the part of WSDOT project teams to control contingency spending	Examine the causes behind the higher EEs, and refine the estimating process (and/or the historical cost and risk database) as necessary.

8.4 Recommendations on Cost Estimating and Budgeting

Based on the observations and risks identified above, the consultant team offers the following recommendations:

1. **WSDOT should work with key legislators and legislative staff to more effectively appropriate funds for DB projects.** The current funding appropriation process is perceived by industry as presenting potential challenges to the most effective use of DB delivery. Given the uniqueness of the Connecting Washington legislation and state funding processes, it may be appropriate for WSDOT to work with key legislators and the legislative staff to discuss how to appropriate funds more effectively for DB projects. To this end, WSDOT executives and the Office of Financial Management should engage in a discussion with legislative transportation leaders and legislative staff about improvements that could be made to how funds are appropriated to better accommodate DB projects. After the initial discussions, the proposed changes should be formalized as an official budget request, which legislative staff can present to legislative members for final approval through the normal budget and legislative process.

2. **Examine causes of higher Engineers Estimates (EE) and whether estimating process should be refined.** Comparison of cost data from a sample of WSDOT DB projects to national averages suggests that WSDOT's EEs are high. WSDOT should examine whether the cause is due to market conditions, risk pricing or other reasons, and refine the estimating process if deemed necessary. For example, WSDOT's high EEs could be attributed to conservative estimating practices that build more risk (contingency) pricing into estimates than necessary, misreading of market conditions, use of outdated cost information, or other factors.

9. Risk Management

9.1 Leading Practices

Implementation of a disciplined and comprehensive risk management process can help:

- Ensure identified project risks are assigned to the party best able to manage them.
- Encourage the project teams of both the owner and the design-builder to take appropriate measures to:
  - Minimize adverse impacts to project scope, cost, and schedule;
  - Maximize opportunities to improve the project's objectives (e.g., with regard to lower cost, shorter schedules, enhanced scope, and higher quality); and
  - Minimize management by crisis (i.e., by proactively mitigating *risks* as opposed to reacting to *issues*).

To successfully allocate and manage risks on a DB project generally entails implementation of some of the practices identified below:

Best Practices in DB Risk Allocation

- An organization-wide culture of risk awareness that:
  - supports the participation of all stakeholders in the identification and management of risks and issues;
  - recognizes that uncertainties can lead to *opportunities* (positive outcomes) as well as *risks*;
  - allows for scalability of processes and requirements based on project size, complexity, and criticality; and
  - promotes open and transparent communication of factors that could compromise the successful delivery of a project or program.
- Use of a rigorous and equitably-balanced project risk assessment process (initially conducted early in the project development process and then updated/refined as the project progresses) to:
  - Develop a fair and balanced risk allocation approach that assigns to the design-builder only those risks that it can reasonably control;
  - Identify the need for any contractual incentives (e.g., time-based incentives, shared contingency funds, etc.) to help align the design-builder's goals with those of the owner and the risks being assumed for the project; and

- Coordinate risk management processes across the entire DB program to support management of cross-project dependencies (e.g., with regard to DOT resource constraints), synergies in mitigation efforts, and unified reporting of lessons-learned.

- Updating and maintenance of risk registers and issue logs to support lessons-learned and continuous improvement efforts.

9.2 Observations

In the context of the best practices identified above, the consultant team observes the following:

Risk Identification and Allocation

1. WSDOT has a mature and standardized risk assessment process that is used to identify and evaluate project risks that could impact budget and schedule.

2. WSDOT worked with industry to develop a risk allocation matrix for DB projects that allocates risks commonly encountered on highway construction projects to either WSDOT or the design-builder. The matrix is typically used as a guide or starting point, and then the risk allocation is adjusted in the solicitation documents for each project based on the project-specific risks and conditions that are identified through the project development and risk assessment processes.

3. WSDOT's risk allocation philosophy is in alignment with industry best practices:

    a. WSDOT assumes responsibility for project risks that cannot reasonably be placed under the control of the design-builder, while transferring to the design-builder those risks that can be more effectively managed by industry.

    b. In some cases, risks may also be shared. For example, consistent with other DOTs, WSDOT has used a differing site condition (DSC) risk allocation pool set at specific cap (e.g. if cap is set at $6M, the design-builder is responsible for the first $6M in DSC costs, and WSDOT is responsible for DSC costs in excess of $6M).

4. The overarching risk management philosophy endorsed by all interviewees (from both agencies and industry alike) was that risks should be allocated to the party best able to manage them, after considering project-specific conditions and goals. This philosophy has resulted in DOTs adopting risk sharing approaches for most of the key risk areas. From the industry's perspective, capping or sharing risks can help ensure that DB contracts are not overly onerous.

5. Common risk allocation strategies for key risk areas, as identified through the interviews with the peer agencies, are summarized in the table below. Except where noted, WSDOT's typical approach to these risks is consistent to that of the other transportation agencies.

Risk Area	Common Risk Allocation Strategies (as reported by the peer agencies)	WSDOT Strategy
Differing Site Conditions (DSC)	DOTs allocate the risk of encountering subsurface conditions that are materially different than anticipated or planned (i.e., a "differing site condition") in a variety of ways: • Shifting the risk of subsurface conditions entirely to the design-builder (and thereby inducing the design-builder to build the risk of DSCs into their bids) • Retaining full responsibility for DSC (consistent with federal contract provisions addressing DSC for standard DBB contracts) • Applying a time and materials approach to payment (or alternatively, establishing an owner allowance) for the purposes of paying for removal of known hazardous materials • Sharing the risk for DSC impacts (e.g., delays and/or additional costs) by assigning the design-builder with responsibility for delays and costs up to a defined ceiling, above which the DOT would be responsible for additional delays and costs For DOTs that transfer greater DSC risk to industry for DB projects, a key prerequisite is that the DOT perform reasonably detailed subsurface investigations, perform more borings than would normally be performed, or compensate proposers to perform additional site investigations prior to their submitting proposals.	As part of the procurement documents, WSDOT provides a geotechnical report, which establishes a baseline for what would be considered a differing site condition. Each proposer can also ask for three additional borings, with the resulting information used to supplement the original baseline report. WSDOT has also used a DSC risk allocation pool set at specific cap.
Environmental Permits	The impacts related to permitting risks typically entail delays in obtaining and maintaining the required project permits and conducting any required environmental mitigation. Most DOTs, as the permit holder, retain the primary responsibility and risk for permitting; however, the design-builder's scope will often include assisting with the permitting process and assuming responsibility for permit modifications necessitated by a proposed ATC.	Consistent with the practices of other DOTs: • WSDOT generally obtains all environmental permits prior to issuing the final RFP (and includes such permits with the RFP for the proposers' reference). • If changes are needed based on the DB proposal (or ATC process), WSDOT generally holds the design-builder accountable for the required permit modifications.

Risk Area	Common Risk Allocation Strategies (as reported by the peer agencies)	WSDOT Strategy
Utilities, Railroads, and other Third Party Coordination Efforts	DOTs have applied different approaches to manage utility/third party coordination risks depending on the applicable statutes, the specific project conditions, and/or the level of control a DOT has over utilities and third parties. • Generally, the DOTs will try to mitigate third party risks by coordinating with municipalities and railroads (e.g. by obtaining consent agreements, easements, etc.) in advance of issuing an RFP. • Some DOTs enter into master utility agreements or can claim eminent domain over utilities in the Right of Way (ROW). • Others transfer responsibility for certain utilities to the design-builder or evaluate proposers on their ability to minimize or avoid utilities. • If utility relocations are necessary, some DOTs use a utility reserve account and incentivize the design-builder to come in under the reserve account and share in the savings (or pay up to stipulated amount and require the design-builder to absorb any costs above the allowance).	WSDOT identifies all utility impacts, and relocations needed for the baseline configuration, but holds the design-builder responsible for conducting a site investigation to verify the utility relocations needed. The design-builder will be issued change orders for utilities not shown within a reasonable degree of accuracy in baseline documents, but they are responsible for utilities not found during their required site investigation.
Right of Way (ROW)	The responsibility for acquisition of ROW and easements are generally retained by the DOT. Alternatively, if ROW responsibility is delegated: • The design-builder will be required to develop the ROW map, compile ROW information and conduct appraisals. • The DOT's ROW department will then review and approve each step and handle the legal work. • In some cases, acquisition costs are included in the pricing, and proposers are evaluated based on minimizing the ROW costs. In others, if the design-builder proposes a different concept or alignment, the ROW risk is on the design-builder.	Consistent with the practices of other DOTs: • WSDOT generally assumes responsibility for ROW acquisition. The RFP provides a means for the design-builder to pursue additional permanent ROW for the Work, but doing so requires DOT approval. • The design-builder is responsible for obtaining additional temporary construction easements.

Risk Monitoring and Control

6. WSDOT's Project Risk Management Guide provides a comprehensive summary of each step in a standard risk management process (i.e., risk management planning, risk identification, risk analysis, risk response planning, and risk monitoring and control), and stresses the importance of tracking and managing risks throughout the project development phase of a project.

7. Once a DB project progresses out of the development phase and into design and construction, it does not appear, based on interviews with some of the WSDOT project managers, that project teams are regularly updating and maintaining a project risk register. Maintenance of a risk register for the full project lifecycle can provide an effective tool for promoting regular communication with the design-builder regarding the status of risks facing a project and the effectiveness of the risk mitigation measures being applied.

9.3 Gap Analysis: Risk Management

	Leading Practices	WSDOT's Alignment with Leading Practices	What is WSDOT doing well?	What are the gaps/risks with WSDOT's current practice?	Recommendations
Risk Identification & Allocation	A formal, repeatable risk management process is routinely used by project teams to identify and assess possible project risks and allocate them to the party deemed to be in the best position to effectively manage/mitigate these risks.	**Full alignment** • WSDOT has a mature and standardized risk assessment process that is used to identify and evaluate project risks that could impact budget and schedule. • WSDOT also has a standard DB risk allocation matrix that is adapted for each project to guide risk allocation in the contract documents.	• WSDOT worked with industry to develop the standard risk allocation matrix. • Risk assessment and the allocation matrix will be addressed in the updated DB Manual (based on the Manual's proposed table of contents). • WSDOT strives to clearly document in the solicitation and contract documents all agreements or commitments made with third parties.	Although WSDOT carefully allocates contractual risk, the extent to which WSDOT's risk assessment process is otherwise integrated with other project development and procurement activities is unclear. (For example, on the SR 520 project, the Project Manager commented that it may have been helpful to consider geotechnical approaches as part of the scored criteria and to have more fully defined the geotechnical risks in the contract.)	Develop guidance, to be included in the DB Manual and the formalized training program, to address how the results of the risk assessment process can be used to inform project development and procurement activities.
Risk Monitoring & Control	A project risk register is used to regularly monitor, manage, communicate, and closeout risks for the duration of a project	**Partial alignment** Project teams do not appear to be consistently updating the risk register for the duration of the project.	• A project risk register is generally developed and maintained during the project development phase of a project.	Failure to regularly update the risk register and discuss risks with the design-builder results in missed opportunities to: • Foster a collaborative relationship with the design-builder regarding risk response strategies that benefit the project as a whole • Catalogue risks and effective response strategies to help inform future project development activities	Develop guidance, to be included in the DB Manual and the formalized training program, that stresses the importance of regularly updating the risk register for the duration of the project and using it to facilitate collaborative risk review meetings with the design-builder

9.4 Recommendations on Risk

Based on the observations and risks identified above, the consultant team offers the following recommendation:

1. **Develop guidance to address how to use risk analysis results to assist with project development and procurement.** In furtherance of Recommendation No. 4 in Section 5.4 regarding the appropriate level of front-end investigation and Recommendation No. 2 in Section 7.4 regarding evaluation criteria, guidance should developed to address how the results of the risk assessment can be used not just for contractual risk allocation purposes but also to inform other aspects of project development and procurement. For example, for high risk projects, the project team may want to conduct more front-end investigation and possibly advance the design to a higher level. Alternatively, proposers could be asked, as part of their technical proposals, to identify project risks and how they would manage or mitigate such risks.

2. **Conduct periodic risk review meetings with the design-builder and maintain a risk register for the duration of the project.** Risk review meetings can help foster collaboration and help ensure project risks are effectively being managed to the benefit of the DB team, WSDOT, and the project as a whole. Topics to be discussed include:

    - Effectiveness of risk mitigation measures
    - Additional risks that may have arisen
    - Previously identified risks that may be retired or closed out

    A regularly updated risk register can be an effective tool for facilitating such meetings, as well as for supporting lessons-learned and continuous improvement of the DB program.

10. Contract Administration & Project Execution

10.1 Leading Practices

One of the key areas affecting DB project success involves the practices used by owners to oversee the design-builder's design and construction of the work. The design phase in particular is a critical area where roles and responsibilities between the owner and design-builder must be clearly defined. For public owners in particular, an effective balance must be struck between ensuring the public a good value and allowing industry to have control of the design process. Similarly, the approach to construction quality management may also differ from that used on a DBB project, creating challenges for DOT staff accustomed to traditional roles and responsibilities.

Practices used to help overcome such challenges and successfully administer and oversee DB projects include the following:

Best Practices in DB Contract Administration

Contract Administration

- Development of standard contract templates and forms to help administer and manage contracts;
- Education and training for those individuals who administer contracts to ensure consistent understanding of the contract's language and its practical application;
- Post-construction (or after action) reviews to identify any lessons-learned or trends (e.g., in commonly submitted RFIs, change order requests, non-conformance reports, incident reports, etc.) that could suggest a need for changes to the contract documents; and
- Effective communication practices, including co-location and consistency of staff.

Quality Management and Oversight

- Well-documented and robust oversight processes that:
  - Are scalable to a project's size, complexity, and criticality
  - Promote consistency in design and construction oversight
  - Allow for seamless transitions between the design and construction phases
  - Recognize the changing roles and responsibilities for quality management under DB delivery for both design and construction
- For oversight of design:
  - Implementation of standard review processes that define who performs the review, what types of review are performed, and how reviews are documented

  - For larger or more complex projects, co-location of owner's design staff with that of the design-builder to promote collaboration and facilitate over-the-shoulder reviews
  - Documentation of commonly submitted ATCs, Practical Design concepts, and successful value engineering outcomes to identify any trends that could suggest a need for changes to design standards

- For oversight of construction:
  - Requirement that the design-builder develop and implement a comprehensive and robust quality management plan designed to assure that the materials and workmanship incorporated into the construction conform to the requirements of the approved plans and specifications
  - Verification that the design-builder is adhering to its quality management plan
  - Use of risk management principles to prioritize project elements and quality assurance activities on the basis of the probability of failure and consequence of failure (from the perspective of difficulty to repair or replace, safety, environmental impact, maintenance cost, or cost of rework)
  - Effective handoff to maintenance staff to ensure critical knowledge is not lost

Change Order Management

- Development and adherence to definitive change order management processes to ensure that changes are identified, evaluated, coordinated, reviewed, approved, and documented; and
- Inclusion of a fair and balanced contractual process that facilitates and expedites the review and resolution of potential changes to the contract and adjustments in the contract price and time.

10.2 Observations

In the context of the best practices identified above, the consultant team observes the following:

Policies and Procedures for Contract Administration

1. WSDOT currently lacks any formal guidance or training program related to owner monitoring, supervision, and oversight during project execution – a key area affecting DB project success. The design phase in particular is challenging some WSDOT designers who are having difficulty understanding their role in the final design process.

2. Existing DB manuals from other agencies primarily focus on pre-construction activities (e.g., project development and procurement). Based on interviews with the peer agencies, the lack of post-award guidance for staff responsible for overseeing the design and construction phases of a DB project is a common concern and not a gap unique to WSDOT.

Design Oversight

3. WSDOT does not have any formalized guidance related to design oversight, which has contributed to staff difficulties in understanding their role in the final design process (as the design-builder and not the DOT assumes the role of Designer-of-Record).

4. WSDOT staff have in some cases struggled with:

    - Letting go of their own preferences with regard to design solutions, and
    - Understanding that the adequate level of design detail to construct a DB project does not necessarily need to mirror that used to bid and construct a DBB project.

    Industry representatives indicated that such issues can hinder the efficient progression of their design effort, and delay the overall completion of the project.

5. The agencies interviewed acknowledged that a successful design phase was dependent in part on DOT staff understanding the need to:

    - Complete and turnaround design reviews quicker than would be the case for a standard DBB contract.
    - Limit design reviews to verifying for compliance with the approved design criteria and the design-builder's quality plans. Practicing such restraint with regard to personal preferences will help prevent design risk from inadvertently shifting back to the DOT and/or resulting in scope changes that increase project costs.

6. Practices used by some DOTs to streamline the review process include:

    - Co-locating with the design-builder and conducting over-the-shoulder reviews;
    - Engaging additional staff (or consultant) resources, with knowledge of the DB process, to assist with reviews;
    - Establishing limits on DOT review timeframes and/or stressing the importance of the expedited nature of DB projects; and
    - Coordinating comments to provide the design-builder with a single set of comments to address

Consistent with best practice, on larger projects, WSDOT routinely co-locates its staff with those of the design-builder.

Co-location helps promote communication, collaboration, and effective and efficient resolution of issues.

Construction Oversight

7. WSDOT generally delegates construction quality management responsibilities to the design-builder for all DB projects. This practice has allowed the DOT to help grow the quality assurance industry in Washington.

8. The success of this practice appears to be mixed. For example:

    - On the I-405/I-5 to SR 169 Stage 2 project, it was reported that third-party inspectors had difficulty understanding and/or applying WSDOT's materials inspection standards.

- On the SR 520 Eastside Transit and HOV project, construction quality was reportedly an issue as was the communication flow process for non-conformance reports. The QA staff were described as being challenged to think as an owner would in identifying quality problems.

- On the US 2 / Rice Road Intersection Safety Improvement project, the design-builder's quality manager was reportedly often not present on the jobsite when needed to perform quality management activities. This resulted in the WSDOT project team having to assume a larger quality verification role than originally anticipated.

9. For smaller DB projects, having the design-builder assume QA responsibility may not be as efficient (due to the duplication of testing effort needed to ensure compliance with the FHWA verification requirements in 23 CFR 637). For example, the project engineer assigned to the US 2 / Rice Road project noted that the redundancy between the design-builder's quality control testing and the DOT's verification testing generally becomes more pronounced the smaller the project.

Change Order Management

10. WSDOT's current template documents contain what appears to be a balanced contractual process for administering changes to the contract.

11. The consultant team reviewed the change orders executed for several WSDOT DB projects. However, the team was unable to reach a meaningful conclusion regarding the impact of change orders for WSDOT DB projects. Though the number of change orders were somewhat higher for WSDOT projects than for projects outside of Washington, a more meaningful metric would be a comparison of the relative cost growth for different categories of change orders (i.e. owner-directed, unforeseen conditions, errors and omissions, etc.). These change order categories were not consistently provided in the sample of WSDOT DB projects reviewed. Thus, no conclusions can be made from reviewing this data aside from noting the observations made by the WSDOT project engineers in addressing the causes of specific change orders.

10.3 Gap Analysis: DB Contract Administration

	Leading Practices	WSDOT's Alignment with Leading Practices	What is WSDOT doing well?	What are the gaps/risks with WSDOT's current practice?	Recommendations
Design Oversight	Design oversight processes are standardized and consistently applied.	**Partial alignment** Post-award DB processes remain largely ad hoc and may be inconsistently interpreted or applied by staff. Best practices are informally conveyed to project team members through the mentoring efforts of experienced project engineers.	• Based on the proposed table of contents, WSDOT's updated DB Manual will address design oversight processes. • WSDOT has some very experienced project engineers, whose knowledge and lessons-learned could be leveraged to develop effective guidance and training materials.	Lack of guidance related to effective design review practices could contribute to: • Inconsistency in design reviews across project teams • Misunderstanding of WSDOT's role in the design phase (i.e., DOT staff should be reviewing designs for contractual compliance) • Inadequate turnaround of design reviews to meet the expedited pace of a DB project • Delays and inefficiencies to the design process	• Develop guidance, to be included in the DB Manual and the formalized training program, to address the design oversight function. • For large projects, continue to co-locate DOT staff with that of the design-builder. • Collect lessons-learned to identify any need to refine processes. • Design oversight staff should be dedicated to the project and provided with delegated authority to provide the design-builder with a single set of comments to address.
Construction Oversight	Construction management processes are standardized and consistently applied. Contract closeout process is used to facilitate continuous improvement.	**Partial alignment** Post-award DB processes remain largely ad hoc and may be inconsistently interpreted or applied by staff. Best practices are informally conveyed to project team members through the mentoring efforts of experienced project engineers.	• Based on the proposed table of contents, WSDOT's updated DB Manual will address construction oversight processes and other administrative functions (e.g., change orders, documentation, etc.). • Contractual responsibility for construction quality management is primarily assigned to the design-builder – a practice which has fostered growth and maturation of the quality management industry in Washington	Lack of guidance related to effective construction oversight practices could contribute to: • Inconsistency across project teams • Misunderstanding of WSDOT's role • Inefficient allocation of resources	• Develop guidance, to be included in the DB Manual and the formalized training program, to address the construction oversight function. • For smaller projects, consider retaining responsibility for quality assurance to avoid duplication of testing efforts. • Collect lessons-learned to identify any need to refine processes.

	Leading Practices	WSDOT's Alignment with Leading Practices	What is WSDOT doing well?	What are the gaps/risks with WSDOT's current practice?	Recommendations
Change Management	Contracts include a fair and balanced process that facilitates and expedites the review and resolution of potential changes to the contract.	**Partial alignment** WSDOT has clear contractual language and standard guidance addressing the delegation of approval and execution authority for change orders. However, there appears to be minimal guidance to assist project teams with the evaluation of change order requests submitted by design-builders.	WSDOT's current template documents contain what appears to be a balanced contractual process for administering changes to the contract.	Lack of guidance on change order evaluation and management for DB projects can lead to: • Questionable decisions regarding whether a change order request truly represents a change to the DB scope of work • Delays in decision-making on change order requests and claims (which in turn, could increase costs and exacerbate relations between the owner and design-builder).	Develop guidance, to be included in the DB Manual and the formalized training program, to assist project teams with the evaluation, tracking, and reporting of change orders.

10.4 Recommendations on Contract Administration

Based on the observations and risks identified above, the consultant team offers the following recommendations:

1. **Dedicate qualified key staff as needed to the full project life-cycle (design and construction phases).** After the decision is made to use DB, particularly for larger projects, a project team should be assembled and remain intact as long necessary help ensure that valuable information is not lost between project phases (thereby reducing or eliminating project learning curves), and help ensure effective collaboration with the design-builder and timely issue resolution.

2. **Develop guidance to assist DOT staff with the design and construction oversight functions.** Expanding upon Recommendation No. 2 in Section 3.4, regarding the development of an updated DB Manual, guidance should be developed to assist staff responsible for overseeing the design-builder's execution of the design and construction phases of the project. Development of standard design review templates and inspection checklists could further promote consistency.

   Best practices in design and construction oversight should also be incorporated into the training program recommended in Recommendation No. 2 in Section 4.4.

3. **Conduct project-specific training for large or complicated projects (e.g. projects >$100M or projects with complex geotechnical features, structures, or staging).** For large or complicated projects, WSDOT should provide project-specific training to the project team on contract administration, execution risks, and similar matters.

   While this is being done on an ad hoc basis to some extent currently (through peer-to-peer mentoring), we recommend that it be considered a fundamental part of WSDOT's project execution process and training/mentoring program. Such training is intended to help inform the WSDOT project team about specific project risks and application of contract terms and conditions, thereby priming the team for effective management of the project.

4. **Optimize quality management for small DB projects.** The processes described in the DB Manual should be scalable to projects of varying types, sizes, and complexity. To this end, WSDOT may want to consider optimizing the quality management processes for smaller DB projects by:

   - Reducing verification testing frequencies for low risk items or small quantities, and/or

   - Retaining acceptance testing responsibility (instead of assigning this to the design-builder) to minimize duplication of testing efforts.

PART 3

Implementation Plan

11. Implementation Plan **93**

Part 3 Objectives

- Prioritize the improvement recommendations previously identified in Part 2 on the basis of urgency, need, and the anticipated beneficial impacts.
- Propose a high-level implementation timeline that considers the proper sequence in which recommendations must occur and the resources required to implement them.

11. Implementation Plan

11.1 Recommendations

Part 2 of this report identified recommendations and enhancements to better align WSDOT's DB program with leading industry practices. Successful implementation of these recommendations requires careful planning to ensure that WSDOT's immediate needs are addressed first, followed by a properly sequenced and phased plan of longer-term measures.

Table 11.1 prioritizes the recommendations identified in Part 2 within each general category based on consideration of the following:

- The proper sequence in which recommendations should occur (for example, development and implementation of programmatic documents must be complete before more advanced training can occur);
- Implementation costs (based on an order-of-magnitude estimate of either one-time (O) or recurring (R) implementation costs);
- Implementation difficulty; and
- The beneficial impact of the recommendation.

As WSDOT moves toward implementation, it will need to estimate the implementation costs and determine which recommendations require additional funding, and which they can accomplish within their existing budget. The level of difficulty to implement a recommendation, particularly in the short term, may or may not be tied to funding or available resources. Other challenges could be internal DOT or external industry resistance to adopting a recommendation, the need for legislative action, or timing (e.g., advance work is required before a recommendation can be implemented). The potential benefits should be weighed against the cost and difficulty. As noted below, WSDOT is moving forward with several initiatives in alignment with these recommendations.

Table 11.2: Recommendations and Implementation Considerations

	Recommendation	Implementation					Benefits [3]
		Timing	Cost [1]		Difficulty	Status	
(1) DB Program Development & Management	A. Develop and/or update WSDOT's standard DB procurement and contract forms	1-6 months	<$100k	O	Low	Underway	❷ ❸
	B. Finalize and issue updated DB manual	6-18 months	$100 - $500k	O	Moderate	---	❷
	C. Develop and implement an internal and external rollout strategy for programmatic documents	6-18 months	<$100k	O	Low	---	❷ ❸
	D. Maintain and update the contract document templates and DB Manual as additional recommended policies or procurement policies or procurement strategies are adopted	> 18 months	<$100k	R	Low	---	❷ ❸
	E. Establish and maintain a database of DB lessons-learned	1-6 months	<$100k	R	Moderate	Underway	❶ ❷ ❸
(2) Staffing and Training	A. Increase DB Headquarters staff	1-6 months	$100 - $500k	O	Moderate	Underway	❶ ❷
	B. Develop and implement a formal DB training and mentoring program to increase DB skills and expertise across the Regions	> 18 months	$100 - $500k	R	High	Underway	❸ ❹ ❺ ❻
	C. Designate technical experts within DOT to support DB teams	6-18 months	<$100k	O	Low	Underway	❶ ❷
	D. Offer DB credentials and experience (rotation) and a more competitive compensation structure as part of career development/retention plan	> 18 months	> $500k	R	High	---	❸ ❹
	E. Optimize use of consultants	> 18 months	---	-- [2]	Low	---	❷ ❹

(1) Not all costs require a new appropriation or new funding. One-time $ = O, Recurring $ = R. WSDOT will need to determine which of these recommendations require additional funding, and which they can accomplish within their existing budgets.

(2) No cost policy change and/or cost savings

(3) See key of benefits below.

Benefits

❶ Reduce errors and conflicts
❷ Improve DB program consistency
❸ Improve efficiency of DB execution
❹ Increase and retain staff competency
❺ Accelerate project delivery
❻ Save project cost
❼ Reduce change orders/cost growth
❽ Enhance opportunities for innovation
❾ Increase competition
❿ Improved budgeting
⓫ Improve quality/evaluation of proposals
⓬ Improve communication & collaboration

	Recommendation	Implementation					Benefits [2]
		Timing	Cost [1]		Difficulty	Status	
(3) Project Development	A. Develop guidance to address Practical Design reviews for DB projects (including how process ties to preliminary engineering and procurement)	6-18 months	<$100k	O	Moderate	Underway	❻
	B. Consider market conditions and availability of DOT resources when determining the scope and size of contract packages	> 18 months	<$100k	R	Low	---	❼ ❾
	C. Develop and implement performance specifications	6-18 months	$100 - $500k	O	Moderate	---	❻ ❽
	D. Perform appropriate levels of front-end investigation	1-6 months	$100 - $500k	R	Low	---	❻ ❼
(4) Delivery Method Selection	A. Experiment with alternative DB delivery and procurement methods (e.g., bundling, low bid, single step)	> 18 months	$100 - $500k	O	Moderate	---	❸ ❺
	B. Refine PDMSG and manual as appropriate based on systematic comparisons of the results of using various project delivery strategies (e.g., DB, design-bid-build, and GC/CM)	> 18 months	$100 - $500k	O	High	---	❸

(1) Not all costs require a new appropriation or new funding. One-time $ = O, Recurring $ = R. WSDOT will need to determine which of these recommendations require additional funding, and which they can accomplish within their existing budgets.

(2) See key of benefits below.

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❾ Increase competition
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⓬ Improve communication & collaboration

	Recommendation	Implementation					Benefits [3]
		Timing	Cost [1]		Difficulty	Status	
(5) Procurement	A. Streamline procurement process for small DB projects (e.g., expand shortlist, pass/fail qualifications criteria, or use an accelerated process)	> 18 months	<$100k	O	Moderate-High	---	❸ ❻ ❾
	B. Refine evaluation criteria to: – Assign greater weight to qualifications and technical evaluation criteria when seeking innovation – Address the prior working relationship of the DB team	> 18 months	<$100k	O	Low	---	❼ ⓫ ⓬
	C. Optimize the efficiency of the ATC process and one-on-one meetings	6-18 months	---	-- [2]	Low	---	❸
	D. Establish and maintain a database of ATCs, and use the data to: – Establish preapproved elements to expedite the ATC process – Identify opportunities to introduce more flexibility into current design standards	> 18 months	<$100k	R	Moderate	Underway	❷ ❸
	E. Ensure the objectivity of the proposal evaluation process	6-18 months	---	-- [2]	Low	---	⓫
(6) Budgeting & Cost Estimating	A. Work with legislative staff to more effectively appropriate funds for DB projects	1-6 months	<$100k	O	Moderate	---	❿
	B. Examine if Engineer Estimates are resulting in an over-allocation of funds and refine estimating process as necessary	1-6 months	<$100k	O	Moderate	---	❿

(1) Not all costs require a new appropriation or new funding. One-time $ = O, Recurring $ = R. WSDOT will need to determine which of these recommendations require additional funding, and which they can accomplish within their existing budgets.

(2) No cost policy change and/or cost savings

(3) See key of benefits below.

Benefits

❶ Reduce errors and conflicts
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❾ Increase competition
❿ Improved budgeting
⓫ Improve quality/evaluation of proposals
⓬ Improve communication & collaboration

	Recommendation	Implementation					Benefits [2]
		Timing	Cost [1]		Difficulty	Status	
(7) Risk	A. Develop guidance, for inclusion in the DB Manual, regarding how to use the risk analysis results to assist with: – Project development (i.e., level of design development and front-end investigation) – Procurement (evaluation criteria) – Contractual risk allocation	6-18 months	<$100k	O	Moderate	---	❼
(7) Risk	B. During the execution phase of a DB project, conduct periodic risk review meetings and regularly update the project risk register	6-18 months	<$100k	R	Low	---	⓬
(8) Project Execution	A. Dedicate staff as necessary to the full project-lifecycle (design and construction phases)	1-6 months	<$100k	O	Moderate	---	❸ ❹ ⓬
(8) Project Execution	B. Dedicate experienced staff with delegated authority to the design oversight function	6-18 months	$100 - $500k	O	Moderate	---	❷ ❸ ❹
(8) Project Execution	C. Conduct project-specific workshops for larger or complex DB projects	6-18 months	<$100k	R	Moderate	---	❷ ❸ ❹
(8) Project Execution	D. Optimize quality management for smaller projects	6-18 months	<$100k	O	Low	---	❸ ❻

(1) Not all costs require a new appropriation or new funding. One-time $ = O, Recurring $ = R. WSDOT will need to determine which of these recommendations require additional funding, and which they can accomplish within their existing budgets.

(2) See key of benefits below.

Benefits

❶ Reduce errors and conflicts
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⓫ Improve quality/evaluation of proposals
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11.2 Implementation Timeline

Figure 11.1 presents a proposed timeline for adopting certain recommendations. It is assumed that the policy-related recommendations under Contract Administration and Project Execution will be addressed in the DB Manual and training activities. The budgeting recommendation is a one-time programmatic policy decision that affects the current Connecting Washington program.

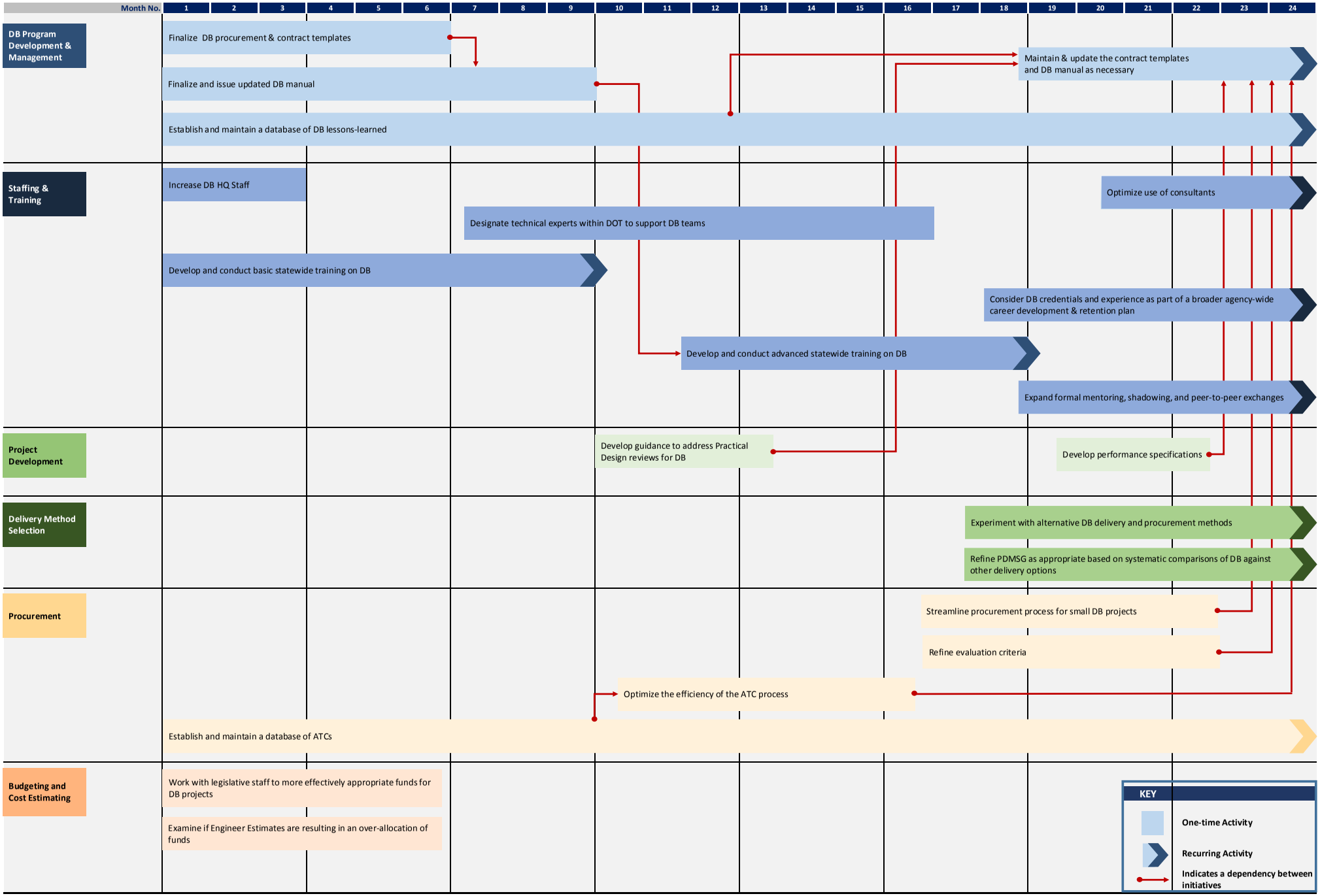

Figure 11.1: Implementation Timeline

APPENDIX B

LEGISLATIVE WORKFORCE DIRECTION

Legislative Workforce Direction

Over the course of the last 16 years, there has been direction from the legislature regarding department workforce policy. Some of the direction has been very specific, such as reducing to and maintaining the highway construction program FTE's to 2,000 or below to bring the program back to Pre Nickel and TPA levels. Some of the direction has not been specific, such as directing the Ferry capital program, in 2009, to ensure staffing levels are at the most efficient level necessary to implement the capital program.

This document will summarize the legislative direction that the department has received from the 2001-03 biennium to the present biennium 2015-17. This also includes language that was vetoed by the Governor but still provides some insight into what the legislature was focusing on at the time.

2003 - SSB 5248

SSB 5248 authorized contracting out of transportation construction and engineering services and prevailing wage process improvements and increased apprenticeships and required local government transportation efficiencies as a condition of receiving state funds.

2005 – ESSB 6091 Section 605

This section directed the department to eliminate 131 middle management positions with the caveat that delivery of the Nickel and TPA programs would not be impacted. This section was vetoed because of the caveat however, the reduction of FTE's and associated reduction of costs was still assumed in the enacted budget. This reduction was also assumed in the Governor's proposed budget. (See attachment 1 for the language and 1.1 for the veto language)

2008 – ESHB 2878 Section 309 (11)

This provision directed the department to review staffing in the ferry engineering divisions to ensure core competency and focus on terminal and vessel preservation with staffing sufficient to implement the preservation program. Until completion of the review, staffing levels were to remain at or below the staffing level on January 1, 2008. (See attachment 2 for the language)

2009 – ESSB 5352 Section 309 (9)

This provision directs the department to review and adjust the ferry capital staffing to ensure the most efficient level necessary to deliver the program in the transportation budget. This language is slightly different from 2008 in that the focus is delivery of the entire program, not just the preservation portion of the program. (See attachment 3 for the language)

2011 – ESHB 1175 Section 204 (2)

This provision directs the JTC to perform a study to make recommendations on the ferry organizational structure that will result in efficient operations and a more balanced management structure scaled to the workforce. This provision was vetoed by the Governor due to the extensive studies that have been conducted on the ferry program which requires resources that could best be used by system. (See attachment 4 for the language and 4.1 for the veto language)

2011 – ESHB 1175 Section 308 (10)

This provision is essentially the same as the 2009 language above. The Governor vetoed this section because the Legislature directed the department to right size the work force in another section of this budget bill. (See attachment 5 for the language and attachment 5.1 for the veto language)

2011 – ESHB 1175 Section 608

This provision states that the current workforce levels are sustainable with current law program projections. To that end, the department is directed to reduce highway construction workforce levels from 2,800 FTE's by 400 FTE's in 2011-13 and another 400 FTE's in 2013-15 to reach a target of 2,000 FTE's by June 30, 2015. The 2,000 FTE level is assumed to be the correct level to deliver the highway construction program funded with current law revenues. Additionally, to successfully deliver the highway construction program, the department may continue to contract out engineering and technical services. The department may also continue the incentive program for voluntary separations. The department was successful in reducing FTEs to below 2,400. (See attachment 6 for the language)

2012 – ESHB 2190 Section 602

This language directs the department to reduce the size of the workforce in the identified administrative operating programs in the 2013-2015 biennium by 3%. The operating programs identified are C, H, T and S. Additionally, the language requires a ratio for EMS and WMS of 6 staff for every manager by June 30, 2015. This section was vetoed by the Governor because the work load should inform the budget levels needed. The ratio was also questioned because the programs involved provide statewide guidance and oversight and require more managers than other programs. (See attachment 7 for the language and attachment 7.1 for the veto language)

2013 – ESSB 5024 Section 306 (15)

This subsection provides funding for the department to design and acquire right of way on selected projects expedite delivery should construction funding be identified at some point in the future. The language also states that the department shall provide for the continuity of both state and consulting engineer workforce, utilizing private sector involvement to be consistent with the department's business plan for staffing the highway construction program in the 2013-15 biennium i.e. consistent with reduction to 2,000 FTE's. (See attachment 8 for the language)

2013 – ESSB 5024 Section 601

This provision states that the current workforce levels are sustainable with current law program projections and continues the reduction of highway construction FTEs to 2,000 by June 30, 2015. The language also provides an expectation that the department will deliver programs in

an efficient and effective manner in strong partnership with the private sector. The department may also continue the incentive program for voluntary separations. The department was successful in reducing highway construction FTEs to below 2,000. (See attachment 9 for the language)

2013 – ESSB 5024 Section 903 (48)

This subsection provides funding for the department in the 2011-13 biennium to design and acquire right of way on selected projects expedite delivery should construction funding be identified at some point in the future. The language also states that the department shall provide for the continuity of both state and consulting engineer workforce, utilizing private sector involvement to ensure consistency with the department's business plan for staffing the highway construction program in the 2013-15 biennium i.e. consistent with reduction to 2,000 FTE's. (See attachment 10 for the language)

2015 – 2ESSB 5988 Section 501

The department is directed to develop and implement a construction program business so that future staffing levels are sustainable and meet necessary skill sets. The language also says that this can be done in close partnership with the private sector. The department is also directed to maintain current workforce to levels that approximate the current levels in place knowing minor adjustments will be needed to meet project delivery goals. Additionally, the department may continue to hire consultants for engineering and technical services. Finally, the department is directed to prepare a report regarding employee recruitment and retention issues affecting project delivery. (See attachment 11 for the language)

Much of the earlier legislative direction was focused on department management and the ferries workforce. Later guidance has focused on a sustainable workforce for the highway construction program. The department's plan to deliver the Nickel and TPA included staffing up to almost 3,000 FTEs and utilizing consultants mainly on the mega projects of AWV, SR 520 and I-405. When the pre-construction was mostly finished for those projects, the department found itself in a position of needing to move forward with Reduction in Force processes as there was not enough work to support the higher FTE level. While the RIF process was ultimately not utilized to great extent, many experienced employees left the department. The legislative direction for the Connecting Washington package is to avoid the major ramp up in state workforce and utilize consultants to deliver the work avoiding the ramp up and RIF cycles and providing a sustainable core workforce.

APPENDIX C

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION RECRUITMENT AND RETENTION STUDY - FINAL REPORT

Washington State Department of Transportation Recruitment and Retention Study

FINAL REPORT

June 27, 2016

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Executive Summary

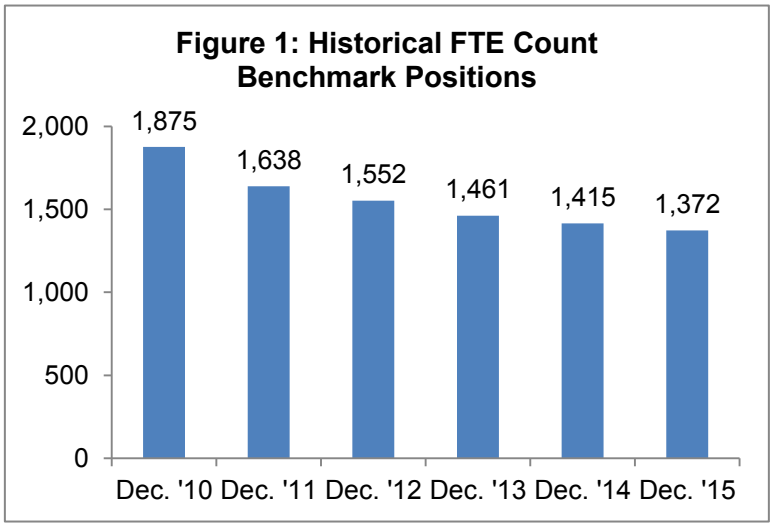
Report Overview

The Washington State Department of Transportation (WSDOT) performs critical work throughout the State in providing safe and efficient transportation systems. These systems are designed, built, and maintained by the nearly 7,000 employees that work for WSDOT. A critical component of that workforce is the approximately 2,000 engineers and technical employees that perform or oversee the majority of technical duties required to carry out this mission.

The scope of this study is to consider issues affecting program oversight and delivery including compensation issues that may hinder the recruitment and retention of a quality core workforce for engineering and technical employees in the ***preliminary engineering*** segment of the workforce. The approximately 1,372 preliminary engineering and technical positions benchmarked in the study are in the right-of-way, design and construction programs in the following classifications:

- Transportation Engineer 1-5
- Transportation Technical Engineer
- Transportation Technician 1-3
- Property and Acquisition Specialist 1-6

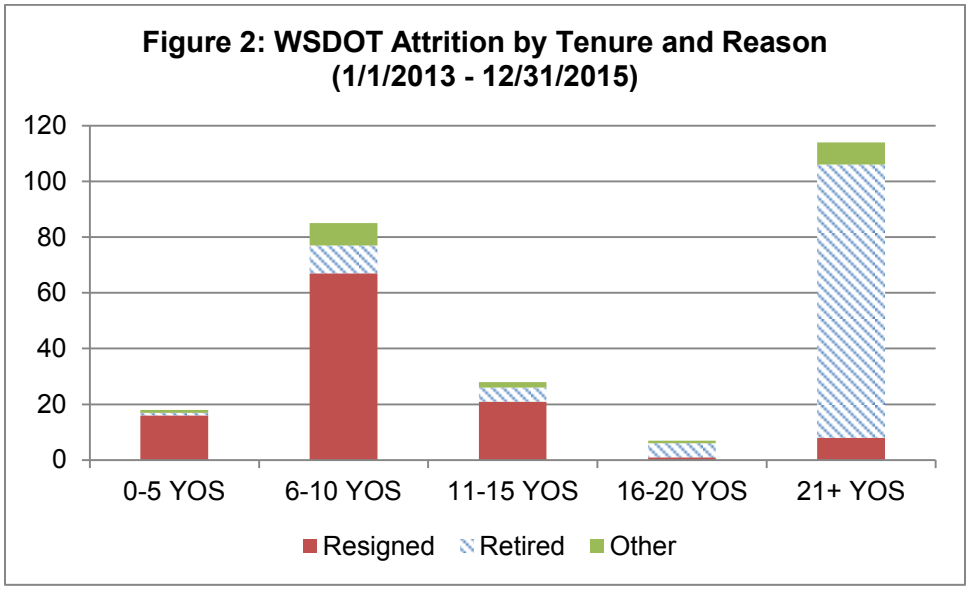
For the remainder of the report, all references to "the benchmark classifications" are the positions in the classifications listed above.



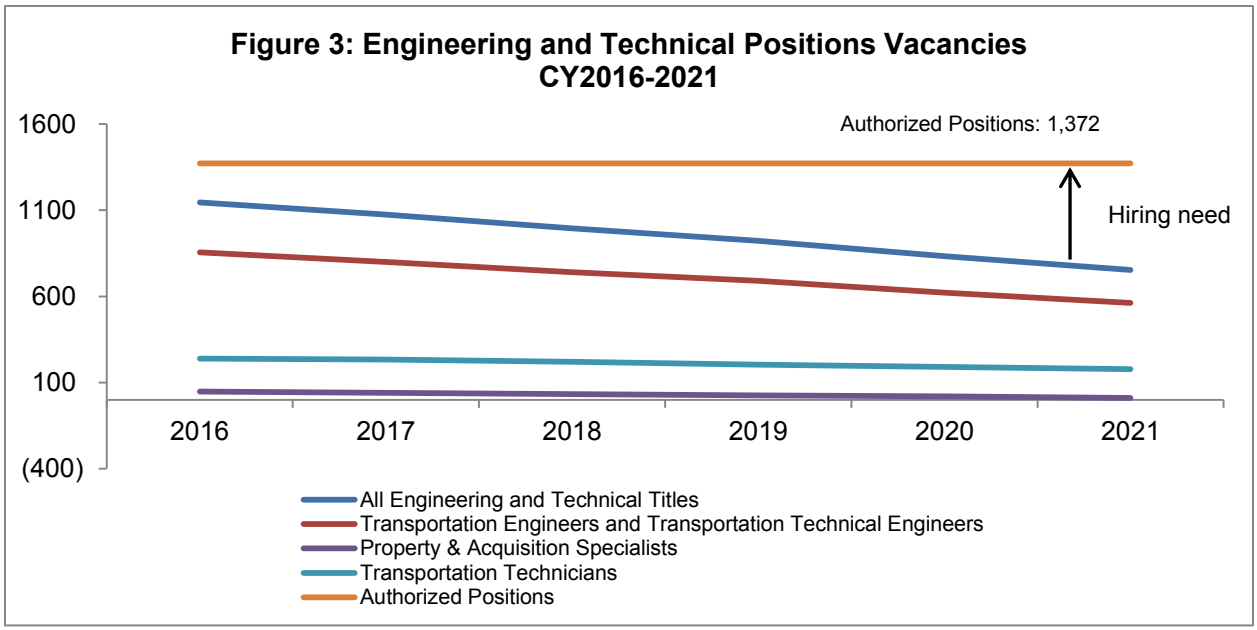
WSDOT reduced the total highway construction engineering and technical workforce by 800 full-time equivalents (FTEs) to achieve workforce levels in line with projected project expenditures. The Legislature (ESHB 2190) mandated the reduction to meet revenue estimates that would sustain an estimated 2,000 positions by the end of the 2013-2015 biennium. The bill required the workforce levels to be reduced by 400 positions in the 2011-2013 biennium and 400 positions in the 2013-2015 biennium, to reach the target staff level of 2,000 FTEs. The number of benchmark classification positions was reduced by just over 500 positions.

As WSDOT moves from a mode of reducing staff and doing their best to maintain existing systems to managing a $16 billion construction program over the next decade and a half, these

positions will become vital. At the same time, WSDOT has been experiencing increasing attrition of trained staff in both mid-career, through resignations for other jobs, and late-career through retirements, as shown in **Figure 2**. This exodus creates concerns regarding training for new employees just at a time when work demands are rising.



In fact, over the next five years, WSDOT is projected to lose 45.1 percent of its workforce in the benchmark classifications through typical attrition trends (see **Figure 3**). This loss of staff means that WSDOT will need to consistently be in the labor market competing for engineering and technical staff, while competing with the same market players to hold onto current staff who are being lured away by significantly higher salaries in the local government and private sector markets.



The competition for engineering and technical talent is strong, and, as shown in **Table 1** below, WSDOT is far behind local public sector employers on pay. WSDOT is able to hire entry-level engineers and technical staff due to the sheer number of jobs available relative to the overall market; however, as can be seen in **Figure 2**, WSDOT starts losing employees in the benchmark classifications to other employers between six and ten years of WSDOT experience.

There are many reasons for this attrition; however, in survey findings of separated employees, compensation emerged as a primary driver of attrition. As shown in **Table 1** below, WSDOT maximum base pay + longevity lags local public sector employers in Washington State by anywhere from 0.3 to almost 34 percent.

Table 1: Summary of Local Public Sector Employers Wage Comparisons

	WSDOT Variance from Median	Rank
Transportation Engineer 1	-13.5%	6 of 6
Transportation Engineer 2	-24.2%	6 of 6
Transportation Engineer 3	-21.6%	7 of 7
Transportation Engineer 4	-28.4%	8 of 8
Transportation Engineer 5	-29.0%	7 of 7
Transportation Technical Engineer	-0.3%	3 of 3
Transportation Technician 1	-16.2%	6 of 6
Transportation Technician 2	-18.2%	7 of 7
Transportation Technician 3	-25.5%	6 of 6
Property & Acquisition Specialist 1	-32.0%	4 of 5
Property & Acquisition Specialist 2	-33.9%	5 of 6
Property & Acquisition Specialist 3	-32.0%	6 of 7
Property & Acquisition Specialist 4	-29.3%	5 of 5
Property & Acquisition Specialist 5	-21.4%	7 of 7
Property & Acquisition Specialist 6	-13.9%	3 of 3

As WSDOT moves forward in implementing the construction projects, they must decide how they plan to staff this work. Those decisions will drive issues related to who the agency needs to hire over the next three years and how the agency wants to position itself in the labor market for many years to come.

Under any circumstance, three changes are needed. Ideally, these changes would be made simultaneously:

1. **Compensation for engineering and technical workers is significantly under market in most classifications. This disparity *must* be addressed in the near term**. This can be done through a combination of across-the-board increases to base salary, targeted specialty pay for difficult-to-hire positions, geographic pay, or a combination of these types of compensation increases.

2. **Management needs to develop a service-delivery plan for the recently-approved construction program** to determine how much of the upcoming design and construction management work will be done in-house and how much will be contracted out. This will drive hiring needs not so much in how many to hire, but more what skillset to hire.

3. **Recruitment processes need to utilize more proactive methods to find and attract qualified candidates for essential engineering and technical positions**. This could include re-establishing relationships with engineering departments in colleges and universities statewide and expanding the recently-revived internship program to provide necessary backfill for more senior employees who might depart the agency in coming years. These methods are likely to work better for entry-level employees. Experienced engineers are unlikely to come to WSDOT without adjustments in compensation first.

This study looks first to the competitive position the agency is in on a full-cost compensation basis relative to comparative local agencies. Along the way, the study also reviews additional issues that are affecting overall retention in addition to compensation. Secondarily, this study reviews the WSDOT recruitment processes and recommends opportunities to initiate changes that will improve both the quality and longevity of future hires.

The full list of findings and recommendations made in this study are provided below.

FINDINGS AND RECOMMENDATIONS

Compensation

Finding #1: WSDOT compensation for each classification ranks at or near the bottom of the comparison group at every pay juncture (minimum, midpoint, maximum, and maximum base plus longevity).

Finding #2: WSDOT provides additional opportunities for compensation that are not offered as readily by other jurisdictions in the comparison group, including various assignment pays and geographic assignment pay for select classifications and regions.

Finding #3: Geographic assignment pay offered to the Property & Acquisition classifications and the Transportation Engineer 3 (Cadastral Surveyors) does not improve WSDOT's relative position among the comparison group. In fact, when limiting the comparison group to those jurisdictions that fall in the WSDOT regions where geographic assignment pay is offered, the agency's variance from the group median worsens for three classifications. This indicates that the geographic assignment pay is not having its intended effect of improving recruitment and retention in those classifications.

Finding #4: WSDOT employee contributions to health benefits are among the highest in the comparison group, while employee pension contributions are among the lowest of those jurisdictions that offer a retirement plan other than PERS.

Finding #5: WSDOT pay lags other public sector and private sector employers by significant margins, as shown in comparisons with data provided in the 2016 State Salary Survey and Economic Research Institute (ERI) data.

Finding #6: The WSDOT classifications are very broad and individuals within each class may experience different competitive opportunities with both governmental and private jobs. Typically, work requiring higher skill levels and employees with Professional Engineer licenses will have more ability to leave the agency for higher-paying jobs.

Retention

Finding #7: Impact of Design-Build Contracting. Both current and former engineering employees report that because of a contemplated move from design-bid-build to design-build, engineers will become contract managers in charge of overseeing consultant engineers.

> ***Recommendation 7.1.*** As WSDOT moves into the 2017-2019 biennium, the agency should carefully consider how use of the design-build model will impact the current WSDOT engineering and technical workforce. While design-build is more cost and time-effective, current employee opinion of this process is negative overall, as it takes away employees' ability to do the engineering work they believe they were hired to do. Employee feedback on how best to use this process, and when, should be solicited. This can be addressed by having a portion of key projects designed by WSDOT engineering staff.

Finding #8: Broad Classification Specifications. While not reflected in survey or focus group responses, the project team found the current classification specifications for the benchmark classes to be very broad. Moreover, these classifications encompass a significant number of working titles. Focus group participants and WSDOT management both indicated that an employee in a class in one office might perform entirely different work than an employee in that same class in another office. Some working titles within a class might require additional specialized skills that are not recognized with a comparable adjustment in pay because the class is limited to a specific pay grade. This is the case for hydraulic and geotechnical engineers, but can also be present in other working titles as well.

Recommendation 8.1. While the project team acknowledges that a major shift in the way the State classifies employees is not likely, it recommends a comprehensive review of the engineering and technical class specifications. It would provide the opportunity to reevaluate if the duties and requirements of these specifications are in line with pay. Having broad classifications has the benefit of providing flexibility in the hiring process; therefore, alternative compensation options may need to be considered to address recruitment and retention concerns (e.g., expanded assignment pay or licensing pay).

Finding #9: As shown in Chapter 2, WSDOT compensation lags both public and private employers in various local labor markets across the state by significant margins. Additionally, many employees are at maximum base pay (reached after five and one-half years employment) and are thus wholly reliant on across-the-board increases or promotions to improve their compensation year-to-year.

Recommendation 9.1. Working with the Office of Financial Management, WSDOT should develop a long-term compensation strategy to address pay competitiveness within the State's ability to pay. Such a plan will help address current employee dissatisfaction with pay levels and improve the agency's ability to both recruit and retain valuable employees.

Recommendation 9.2. The State should strongly consider significant across-the-board pay increases for engineering and technical employees to remedy a portion of the current disparities with local-government employers.

Finding #10: **Geographic Pay.** Geographic assignment pay is offered to a limited number of classifications and in varying amounts based on classification, as shown in **Table 2**.

Table 2: WSDOT Geographic Assignment Pays

	Regions	Pay Amount
Property & Acquisition Specialist 1	Northwest	2.5%
Property & Acquisition Specialist 2	Eastern Headquarters Northwest Olympic	5.0%
Property & Acquisition Specialist 3 Transportation Engineer 3 (Cadastral Surveyors)	PAS: Eastern Headquarters Northwest Olympic Transportation Engineers: Northwest Region and Urban Corridors Office	10.0%
Property & Acquisition Specialist 4-6	Eastern Headquarters Northwest Olympic	7.5%

Current WSDOT employees in the benchmark classifications suggested that expanding these pays to other titles would be effective in addressing WSDOT's low base pay in relation to higher cost-of-living regions (e.g. Northwest region) or regions where it is difficult to recruit employees (e.g. Eastern region).

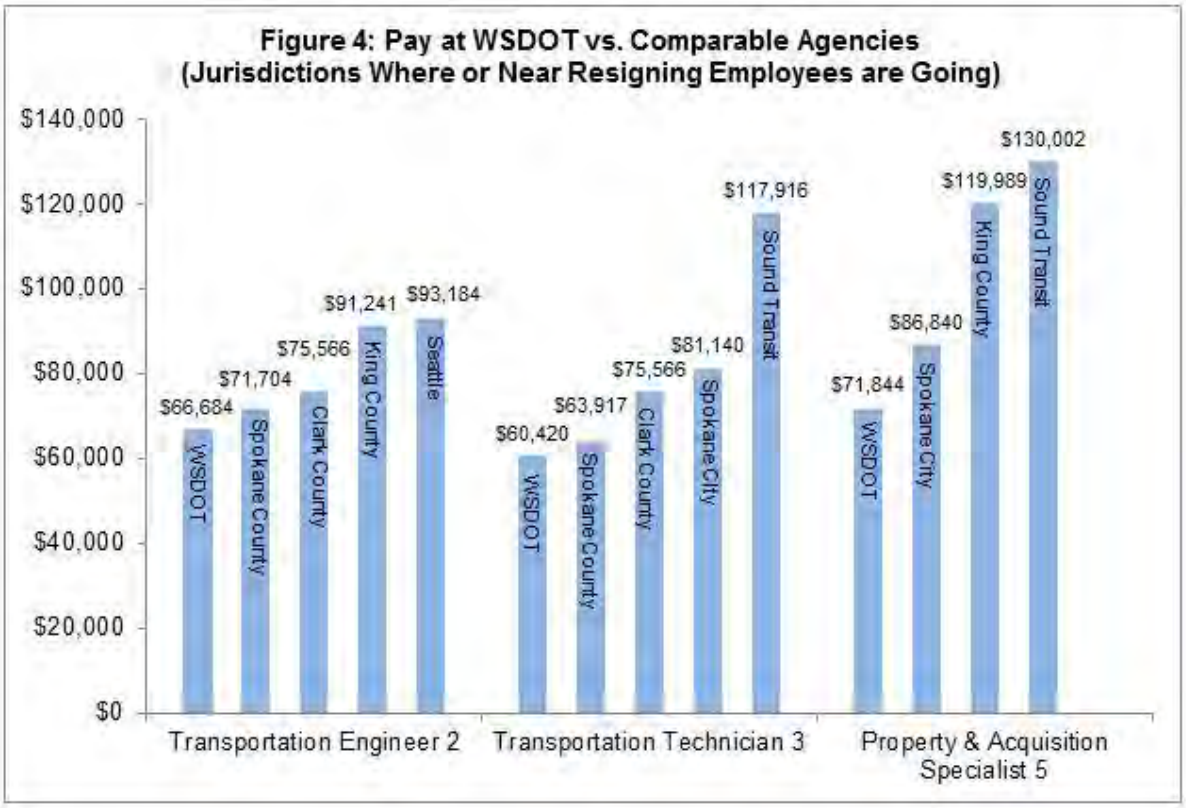


Figure 4 shows the pay differences between WSDOT and several local government comparators for three classifications. Pay differences are greatest in the heavily-populated, high cost-of-living Northwest region.

> ***Recommendation 10.1.*** Geographic assignment pay should be expanded to include all benchmark classifications. In addition, the agency should consider setting this pay not based on classification, but rather based on region. For example, employees in higher cost-of-living regions should receive higher geographic assignment pay.
>
> Any new structure for assignment pay, especially if it is expanded for recruitment and retention purposes, should be based on the market. **Table 3** below shows WSDOT's variance from the median compensation at maximum base[1] in labor markets where the project team benchmarked local public sector employer compensation. Also included in this median calculation is private sector ERI data.[2] More detailed tables are available in **Appendix F**.

[1] Maximum base was used instead of maximum base + longevity as ERI data is only captured for maximum base pay.
[2] ERI data was included for Seattle and Mount Vernon in the Northwest Region, Tacoma and Olympia in the Olympia Region, Spokane in the Eastern Region, and Vancouver in the Southwest Region. ERI data was only available for the Transportation Engineer 2, Transportation Technician 3, and Property & Acquisition Specialist 3 classifications.

In order to implement different geographic pay, WSDOT will need to be able to demonstrate difficulty in retention, hiring, or both in order to justify.

Table 3 shows that significant adjustments in geographic assignment pay will need to be made in most of these key regions to bring WSDOT compensation up to market levels. These changes should be made in tandem with across-the-board compensation increases.[3]

Table 3: WSDOT Variance from Median Pay in Select Regions

Region	WSDOT Variance from Regional Median for all Titles
Northwest	-33.2%
Olympic	-25.3%
Eastern	-4.9%
Southwest	-15.5%

Making geographic assignment pay applicable to all benchmark classifications, as well as basing pay on region rather than classification will not only help retain existing employees whose base pay is significantly below the market, but will also help to attract high quality candidates from areas where pay is more competitive, such as the Northwest region, or where hiring is difficult, such as the eastern side of the State. Adjustments to geographic assignment pay allow the agency to adjust pay without changes to the pay grades of each classification, which are set by State HR. Changes to geographic assignment pay must be made through the collective bargaining process/State HR.

Finding #11: Specialty Pays. WSDOT does not currently provide any additional pay for the possession of a Professional Engineer (PE) Licensure or other needed specialties/licensures. While many classifications do not require this licensure, many of the jobs done in the agency do, and advancement to Assistant Project Engineer and Project Engineer in the WMS requires a PE license.[4]

Recommendation 11.1. Another method for increasing take-home pay outside of across-the-board pay increases, while also encouraging professional development and training, would be to provide an annual educational allowance to support the attainment of a Professional Engineering license. While the allowance amount for the PE licensure should be determined by WSDOT and State HR, the allowance should be contingent upon the employee remaining at WSDOT for a period of years in order to ensure that employees do not leave the organization immediately upon obtaining the license. In

[3] The average of the market for each region was determined by calculating the percentage difference between WSDOT compensation for each title at maximum and the median of compensation at maximum for all benchmark jurisdictions located in that particular WSDOT region. In addition to compensation at the benchmark jurisdictions, private sector ERI data was included in the median calculation for the Transportation Engineer 2, Transportation Technician 3, and Property & Acquisition Specialist 3 titles. Detailed tables showing all jurisdictions and ERI data included in the market median calculation can be found in **Appendix F**.

[4] Some Transportation Engineer 4 positions and all Transportation Engineer 5 positions require a PE license.

addition to providing additional training, having a PE license will prepare more employees for promotion to TE4 and TE5 and to rise to the ranks of the WMS.

Subsidizing the attainment of a PE license would have the additional effect of improving the quality of engineering employees and making it possible for some current Transportation Technicians and Transportation Engineers 1-3 to move into or advance within the Transportation Engineer classifications, providing an incentive, and ability, to seek promotions to these classifications.

Finding #12: Promotion Process. The process for promotion at WSDOT varies by positon, manager, and office location. Uncertainty about the process and requirements for promotion creates uncertainty regarding a career path for employees in the benchmark classifications.

Recommendation 12.1. The agency should undertake a comprehensive review of the processes by which engineering and technical employees in all classifications are promoted to ensure that promotional processes are internally consistent and consistent with current staffing needs.

Finding #13: Employee Dissatisfaction. Feeling valued by the department, along with dissatisfaction with management, were key issues with separated employees. While some level of dissatisfaction lives in any organization, the low pay at WSDOT makes employee satisfaction with management a critical issue.

Recommendation 13.1. WSDOT should include in manager performance reviews a component for review by subordinates. This will allow upper management to understand where managers are doing well and where managers are in need of coaching to improve. Focusing on management performance is a critical issue as the agency works to retain qualified and trained employees. The agency has already begun efforts to improve management performance through individual performance plans and leadership training.

Recruitment

Finding #14: Staffing Plan. The staffing plan through 2019 is to maintain current levels of FTE allocations. Management is in the process of determining how to staff future projects, and is likely to utilize some mixture of WSDOT staff and consultants; however, that mix is not yet determined.

Recommendation 14.1. WSDOT management needs to develop a plan for how they are going to staff projects to be constructed under the new construction funding bill. Once a plan is in place, WSDOT can develop an implementation strategy that will help guide training and recruitment programs.

Recommendation 14.2. There should be regular and scheduled meetings between top WSDOT staff and recruitment staff to help identify staffing needs as early as possible. This provides the opportunity to be more proactive in the hiring process, identifying and

marketing to potential applicants ahead of actual job openings. This cannot be done without a detailed staffing plan and direction for future hiring needs.

Finding #15: Recruitment Plan. An ongoing dialogue between WSDOT managers and the recruiting office has not been established. Currently, the recruitment office works on a reactive rather than proactive basis, as they don't know future recruitment needs. WSDOT HR is working on establishing these connections and developing a detailed hiring plan for the engineering/technical positions.

Recommendation 15.1. WSDOT HR and other senior management should create a proactive recruitment plan in tandem with identification of staffing needs and a formal staffing plan. This recruitment plan should be revisited periodically to ensure that recruitment efforts are effective and meeting staffing needs.

Recommendation 15.2. WSDOT HR should evaluate its use of NEOGOV to ensure use of full functionality of the system to recruit, track, review, and provide statistics on applicants. WSDOT should work with the Department of Enterprise Services and Washington Technology Solutions to determine if enhancements can be made to NEOGOV to provide search methods effective for sourcing candidates.

Recommendation 15.3. WSDOT HR should consider developing a method to track candidates from previous recruitment and outreach efforts to allow for efficient sourcing of candidates for future vacancies. This would maximize sourcing efforts and provide an additional resource for recruiters and HR professionals to quickly identify potential candidates.

Finding #16: Training. There is a need for training of new employees that will be difficult to meet. The reduction in allocated positions over the last several years affected lower-tenured employees the most. WSDOT has fewer trained lower-level employees and a looming retirement bubble that will further drain experienced engineers out of the workforce.

Recommendation 16.1. Using existing vacant FTE positions to bring on new hires as early as possible for training from more experienced staff that is likely to be leaving the agency. This allows the agency to train new hires in an unrushed fashion.

Recommendation 16.2. As training needs intensify with increased new hires and decreased staff at the higher levels, WSDOT should recruit qualified retirees who can help provide training on an ad hoc basis as retired annuitants. This will allow training to occur on a focused basis by someone who understands the job but is not burdened by other project or administrative duties.

Finding #17: Proactive Recruitment. The current recruitment process is reactive to immediate needs identified by managers and approved for hiring. The technical nature of many of the WSDOT jobs requires the early identification of potential applicants with training and interest in civil engineering, transportation engineering, and related fields. A portion of each

recruiter's time should be spent being proactive in developing relationships for future hiring needs.

> ***Recommendation 17.1.*** WSDOT recruiters should reestablish ties with college engineering programs throughout the State and in nearby states.
>
> ***Recommendation 17.2.*** WSDOT should seek to build a robust internship program with the goal of this program feeding into entry-level engineering positions. This will provide the backfill needed for upper-level positions as retirements increase in the coming years.

Finding #18: Specialized Hiring. The WSDOT has had difficulty identifying and hiring specialized technical positions that are critical to the mission of the agency, such as hydrologists, geotechnical, and traffic engineers. This difficulty is largely due to the low pay associated with these positions in the broader job classifications utilized by WSDOT.

> ***Recommendation 18.1.*** Provide compensation incentives for most difficult to hire positions, such as hydrologist or other specialized positions, that have far lower compensation than comparative agencies. In areas where the WSDOT is already significantly below market, it may be most cost effective for the agency to target specialty pay for critical positions that are difficult to hire. This is highlighted by the fact that the broad job classifications used by WSDOT most likely lead to disparities in comparative pay that do not show up in pay comparisons.

Organization of Report and Study Methodology

This report is organized into four chapters. **Chapter 1** explores the drivers behind recent attrition and presents a vacancy projections in the next five and ten years. **Chapter 2** details WSDOT compensation, including cash, health, pension, and other benefits, and compares it to compensation and benefits at local public sector employers. **Chapter 3** explores the WSDOT's recent attrition, the drivers of that attrition, and presents recommendations aimed at keeping WSDOT employees longer. **Chapter 4** gives an overview of the WSDOT recruitment process and provides findings and recommendations related to how WSDOT engineering employees are recruited, selected, and trained. This chapter also provides a staffing plan for 2017-2019 developed with assistance from WSDOT personnel.

Study Methodology

Over the course of the study, the project team used a variety of tools to evaluate the WSDOT's recruitment process, retention experience, and competitive market position. The tools used in this study included:

- Interviews with WSDOT staff
- Review of data provided by the WSDOT Office of Human Resources and the Office of Financial Management State Human Resources
- Benchmark compensation surveys of local public sector employers in Washington State
- Survey of WSDOT former employees in the benchmark classifications who separated from the agency between January 1, 2013 and December 31, 2015

The specific methodology used in this report varies for each area discussed in the following chapters. A detailed description of the specific methodologies used are contained in each of the subsequent chapters. The tools used throughout the study are discussed more fully below.

On-Site Visits

The project team met with key stakeholders inside WSDOT during a two-day period in February 2016, and following. Interviewees included:

- WSDOT Human Resources Personnel (WSDOT HR)
- Office of Financial Management – State Human Resources (State HR)
- WSDOT Recruitment Team
- WSDOT Regional Administrators and Assistant Regional Administrators
- Focus groups of employees in benchmarked titles, including:
    - Property & Acquisition Specialists
    - Transportation Engineers
    - Transportation Technicians

Benchmark Data from Comparable Agencies

The project team surveyed seven local jurisdictions and a local transportation agency. These surveys were utilized to determine the relative labor-market competitiveness of WSDOT's compensation for engineering and technical classifications. This analysis focuses only on the following classifications below, referred to as the "benchmark classifications" throughout this report:

- Transportation Engineer 1-5
- Transportation Technical Engineer
- Transportation Technician 1-3
- Property & Acquisition Specialist 1-6

Local Jurisdictions/Agencies

The benchmark agencies, shown in **Table 4** below, were chosen based on:

- **Size** - includes larger agencies
- **Location** - includes agencies from different parts of the State
- Employers that have attracted WSDOT employees from 2013 - 2015

Table 4: Comparable Jurisdictions

	Population Served	Full-Time Equivalents
WSDOT	**7,061,530**	**6,894**
Clark County	451,008	1,600
King County	2,079,967	12,997
Pierce County	831,928	3,001
Seattle	668,337	12,068
Sound Transit [1]	3,671,478	748
Spokane County	484,318	2,016
Spokane	212,067	2,086
Vancouver	169,303	976

[1] Sound Transit: Population figure reflects total population of area serviced (King, Pierce, and Snohomish Counties)

To evaluate relative compensation, the project team developed and circulated a detailed survey instrument (see **Appendix A**), and collected and reviewed key documents (e.g., pay plans, collective bargaining agreements, and job specifications) covering the benchmark classifications listed above. Unless otherwise noted, all analysis was conducted to compare compensation and benefits as of June 30, 2016.

Comparisons across employers are often imprecise due to differences in economic base and ability to pay, organizational structure, working conditions, types of duties assigned, qualification and skill requirements, and other relevant factors that may vary for similar jobs. The best job match across employers is often not a perfect match, and such variations may contribute to some reported differences in relative compensation.

To achieve reasonable and generally useful matches, classification summaries were prepared from State of Washington classification specifications and incorporated into the survey instrument to assist participants in matching their classifications to the State's benchmark classifications. In some cases, no match was available. In other cases matches provided were for similar but not identical jobs. Classification matches for each jurisdiction can be found in **Appendix D**.

The project team followed up with phone calls and emails to clarify many written survey responses, and conducted independent analysis of job specifications towards identifying the most relevant job matches. In general, however, our findings rely on the matches provided by the survey participants. Because such matches vary in "closeness of fit" to the State's job classifications, it is likely that some outlier pay rates reported may result from relatively weak matches. Greater weight should generally be given to survey medians and modes. Minor variances (approximately 5% or less) may not be significant.

Survey Data

The project team developed a survey that was administered to WSDOT employees in the benchmark classifications who separated between 2013 and 2015. The goal of the survey was to solicit a broad spectrum of information and opinions regarding WSDOT from former employees to provide both an inside and outside view of the agency.

The survey, conducted via Survey Monkey, was open to respondents for one month between April and May 2016. In total, 86 former employees were surveyed, with 40 (46.5%) responding.[5]

The complete list of survey questions is provided in **Appendix A**.

[5] Survey invitations were sent to all employees separated from 2013-2015 for whom an email address could be determined.

Data Provided by WSDOT

WSDOT HR provided data regarding headcounts, vacancies, payroll, and attrition. WSDOT HR also provided the WSDOT-specific results from the State exit survey. Data provided by WSDOT is as of 12/31/2015 unless noted otherwise. State HR also provided the Economic Research Institute (ERI) and 2016 State Salary Survey data.

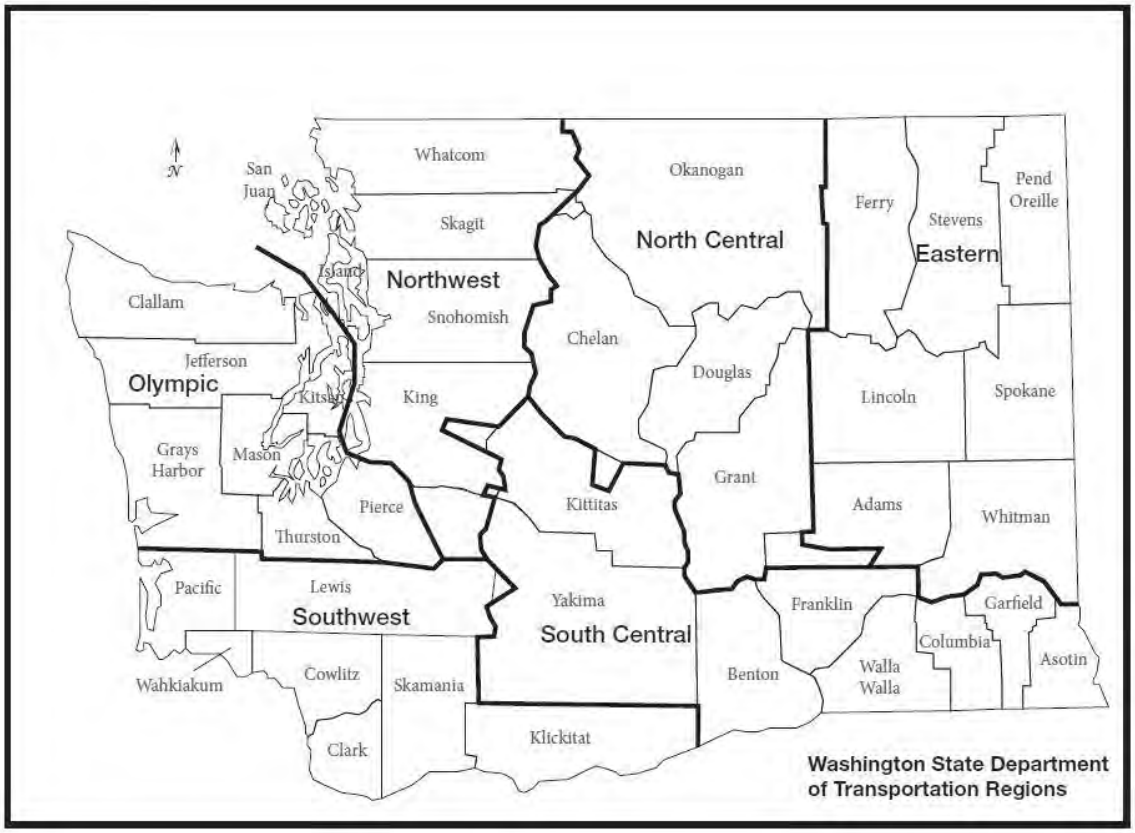
Chapter 1: WSDOT Workforce Composition and Vacancy Projection

INTRODUCTION

The workforce evaluation provides context for this comprehensive study of WSDOT recruitment and retention challenges and opportunities. This initial chapter provides an analysis of WSDOT vacancies and attrition, along with projections of potential staffing levels going forward.

WORKFORCE COMPOSITION

The Washington State Department of Transportation (WSDOT) provides oversight of the State's multimodal transportation system and is responsible for ensuring that people and goods move throughout the State safely and efficiently. The agency operates and maintains 18,000 miles of highways and 3,600 bridges and runs the nation's largest ferry system. To more effectively operate and maintain these resources, the WSDOT is divided into six regions, shown in the map below.



These regions are comprised of approximately 6,894 full-time and part-time staff (as of 12/31/2015). The total number of employees in the benchmark classifications comprises 19.4% of this total headcount, or 1,336 employees, as shown in **Table 5** below.

Table 5: WSDOT Employees

	Filled Positions	Percent[6]
Total Employees	6,894	-
Employees in Benchmark Classifications	1,336	19.4%
Transportation Engineers 1-5	*940*	*70.4%*
Transportation Technicians 1-3	*253*	*18.9%*
Transportation Technical Engineers	*79*	*5.9%*
Property & Acquisition Specialists 1-6	*64*	*4.8%*

[6] Italicized percentages are percentages of the total number of employees in the benchmark classifications examined in this report.

VACANCY ANALYSIS AND PROJECTIONS

Between FY2011 and FY2015, WSDOT was actively reducing its workforce as mandated in legislation (ESHB 2190) in response to revenue issues and the associated lack of projects. In this time period, WSDOT reduced staff in the benchmark classifications by over 500. The majority of the reductions were achieved through attrition, and vacant positions were not replaced.

With the passage of the Connecting Washington $16 billion transportation revenue package, WSDOT is now in a position of needing to be fully staffed and must be able to replace staff that leave the agency with high-quality applicants. WSDOT has seen increasing attrition of its employees in the benchmark classifications in recent years (2013-2015). While a substantial amount of attrition is due to retirement, a growing portion is due to voluntary resignation. During this period, some attrition may have been due to continuing concerns regarding the reduction and the stability of the engineering and technical workforce. From 2013 to 2015, the rate of resignation, or "quit rate" nearly doubled from 1.3 percent to 3.4 percent. While these rates are not out of line with national norms in the state and local government sector, their growth might indicate a negative trend within the agency at a time when it needs to retain valuable employees.

This chapter of the report will address how current attrition rates, including expected retirements, will impact the agency's staffing over the next five years in the benchmark job classes.

Recent Attrition

Based on 2013-2015 separation data provided by WSDOT HR, the majority of resignations among employees in the benchmark classifications occur within the first ten years of employment, with over a third of resignations coming between six and ten years of service. While the historical attrition trends for resignations is colored by the mandated reduction, the pattern of when employees choose to leave is an important factor to consider in analyzing attrition within the agency.

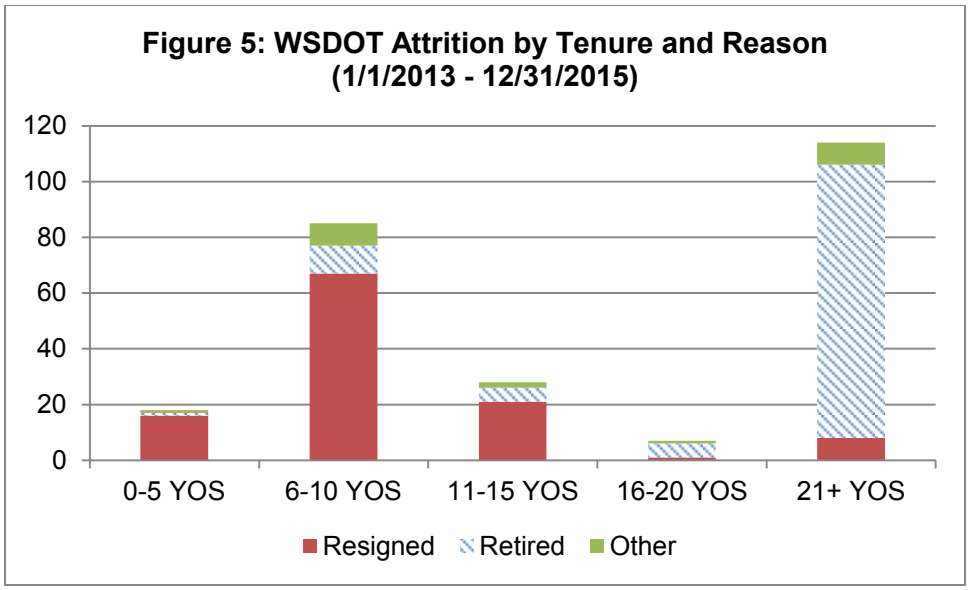


Table 6: WSDOT Attrition by Tenure and Reason

	Resigned	Retired	Other	Total
0-5 YOS	16	1	1	**18 (7.1%)**
6-10 YOS	67	10	8	**85 (33.7%)**
11-15 YOS	21	5	2	**28 (11.1%)**
16-20 YOS	1	5	1	**7 (2.8%)**
21+ YOS	8	98	8	**114 (45.2%)**
Total	**113 (44.8%)**	**119 (47.2%)**	**20 (7.9%)**	**252 (100.0%)**

As employees gain tenure with the agency, the resignation rate decreases; by 21 years of service the primary reason for attrition is retirement.

The agency keeps little data on where employees go to work when they voluntarily resign. State exit survey results and PFM survey results indicate many separated employees go to local governments within the State. This will be discussed in more detail in Chapter 3.

PROJECTED STAFFING LEVELS

In order to properly staff upcoming transportation infrastructure projects across the State, it is important to understand the impacts of continued high attrition and low recruitment. Current staffing levels by classification (as of 12/31/2015) are shown in **Table 7** below.

Table 7: Number of Employees by Classification (As of 12/31/2015)

	# of Employees
Transportation Engineer 1	17
Transportation Engineer 2	458
Transportation Engineer 3	327
Transportation Engineer 4	123
Transportation Engineer 5	15
Transportation Technical Engineer	79
Transportation Technician 1	1
Transportation Technician 2	57
Transportation Technician 3	195
Property & Acquisition Specialist 1	2
Property & Acquisition Specialist 2	0
Property & Acquisition Specialist 3	24
Property & Acquisition Specialist 4	5
Property & Acquisition Specialist 5	30
Property & Acquisition Specialist 6	3
Total	**1,336**

Projection Methodology

The projection focuses on staffing levels for the benchmark classifications using the following general methodology:

- Start with authorized benchmark positions – approximately 1,372 full-time as of December 31, 2015
- SUBTRACT all employees eligible for retirement as of January 1 of each year
- SUBTRACT non-voluntary attrition – estimated at two per year for all classifications and one per year for each individual classifications and geographic region
- SUBTRACT 2015 resignations
- The result is the expected increase or decrease in the total workforce over the five or ten-year projection period

The projections are helpful in understanding the expected hiring needs for the agency over the next several years, but is not meant to be determinative of actual resignation levels or retirement decisions. The projections show that there will be an ongoing hiring need for the agency even without an increase in total FTEs. Detailed vacancy projections can be found in **Appendix B**.

Projection Assumptions

This projection assumes the following:

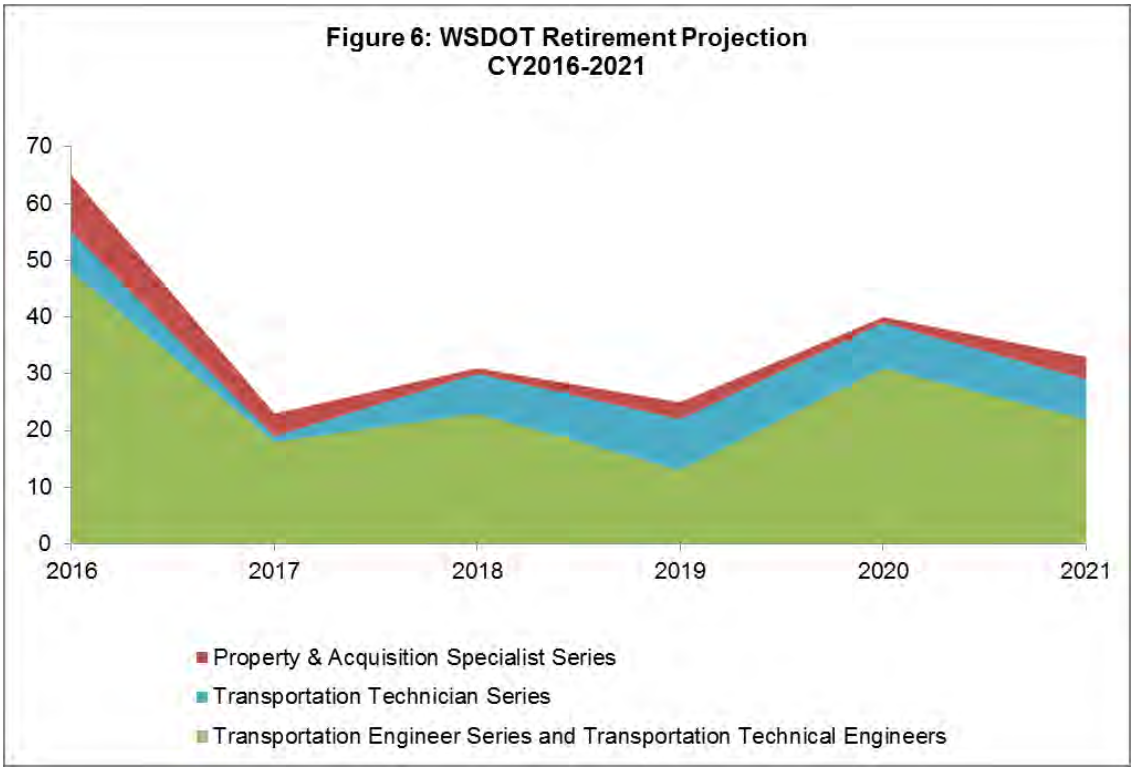
- 2015 resignation levels will continue over the next ten years (there were 45 total resignations in 2015)
- Employees who become eligible to retire in each year will retire[7]
- Non-voluntary attritions will remain low
- No additional hiring to replace lost employees—this does not assume that positions will not be filled, but is meant to show the employee gap that will need to be filled
- Authorized positions remain the same year-to-year

Retirements: Retirement of existing employees will have a marked impact on WSDOT's staffing levels. Retirement projections included in the vacancy projection above assume that an employee will retire in the calendar year in which they become eligible. While not every employee will retire as soon as they are eligible, retirements in the PERS system generally occur within one to three years of eligibility, as shown in the table below. This table shows the average age and years of service (YOS) at the time of retirement in comparison to normal retirement eligibility criteria for each of the PERS plans.[8]

[7] This is an assumption applied to facilitate a projection. Actual employee experience will, of course, vary.
[8] Data provided by the Washington State Department of Retirement Systems. Data reflects normal retirements for the last ten years in each PERS plan. Data reflects all State retirements (total enterprise), not just retirements within WSDOT. WSDOT-specific data was not available.

	Normal Service Retirement Eligibility	Average Age and YOS at Retirement
PERS 1	Any age with 30 YOS Age 55 with 25 YOS Age 60 with 5 YOS	Age: 60.9 YOS: 30.8
PERS 2	Age: 65 YOS: 5 YOS	Age 66.0 YOS: 17.2
PERS 3	Age: 65 YOS: 10 YOS	Age: 65.7 YOS: 19.2

Figure 6 shows engineering and technical employees who will be eligible for retirement through 2021 (a little over five years) and **Table 8** provides this information in tabular form. For all job classifications, 65 of the current 1,445[9] employees (including part time employees) will be eligible to retire in 2016. During this period, 217 employees will be eligible to retire.[10]



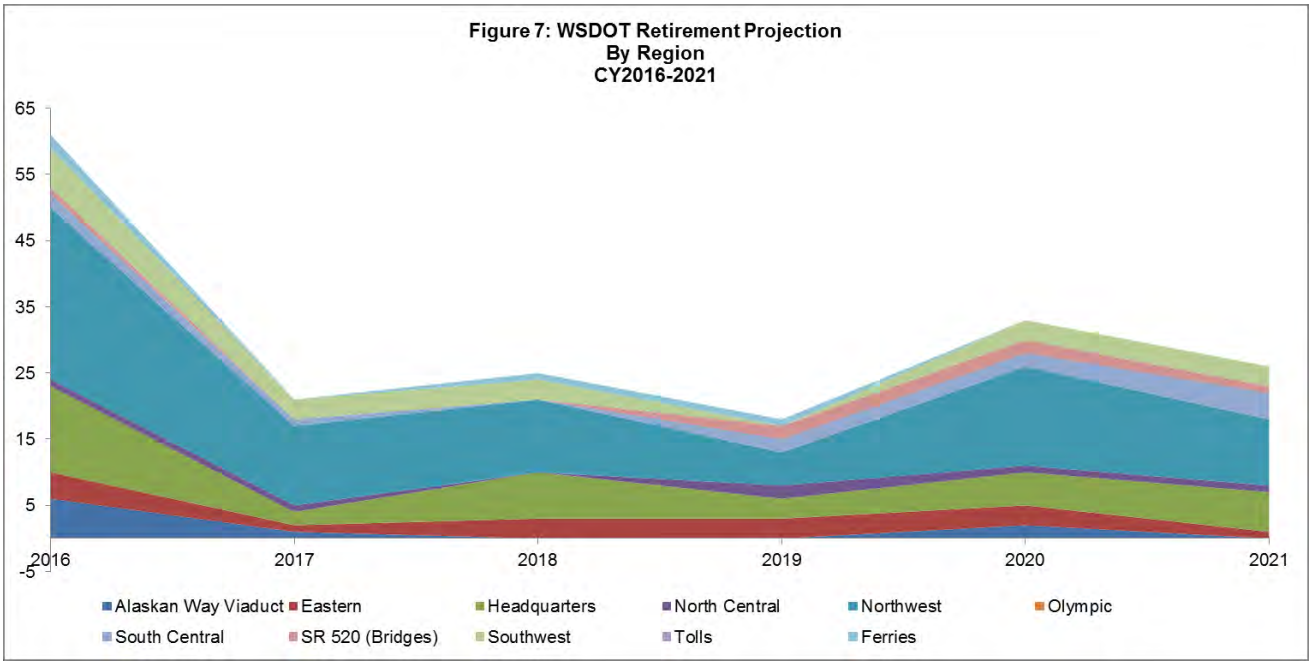
[9] This figure differs from figure on page 12 because this figure includes part-time and employees on extended leave as of 12/31/2015.
[10] A ten year retirement projection can be found in **Appendix C**.

Table 8: WSDOT Retirements in Each Calendar Year, 2016-2026

	2016	2017	2018	2019	2020	2021	Total
All Classifications	65	23	31	25	40	33	**217**
Transportation Engineer Classifications and Transportation Technical Engineers	48	18	23	13	31	22	**155**
Property & Acquisition Specialists	10	4	1	3	1	4	**23**
Transportation Technicians	7	1	7	9	8	7	**39**

If these employees retire as projected, WSDOT will need to replace about 15 percent of its workforce by the end of 2021 to replace retirements alone. The replacements will likely be recent college graduates, thus replacing the person but not the lost experience and expertise.

Figure 7 shows the number of retirements by WSDOT region or other subdivision (Alaskan Way Viaduct, Bridges, Tolls, and Ferries) for the same time period.



Over 35 percent of projected retirements through 2021 will occur in the northwest region, where a significant portion of WSDOT work takes place.

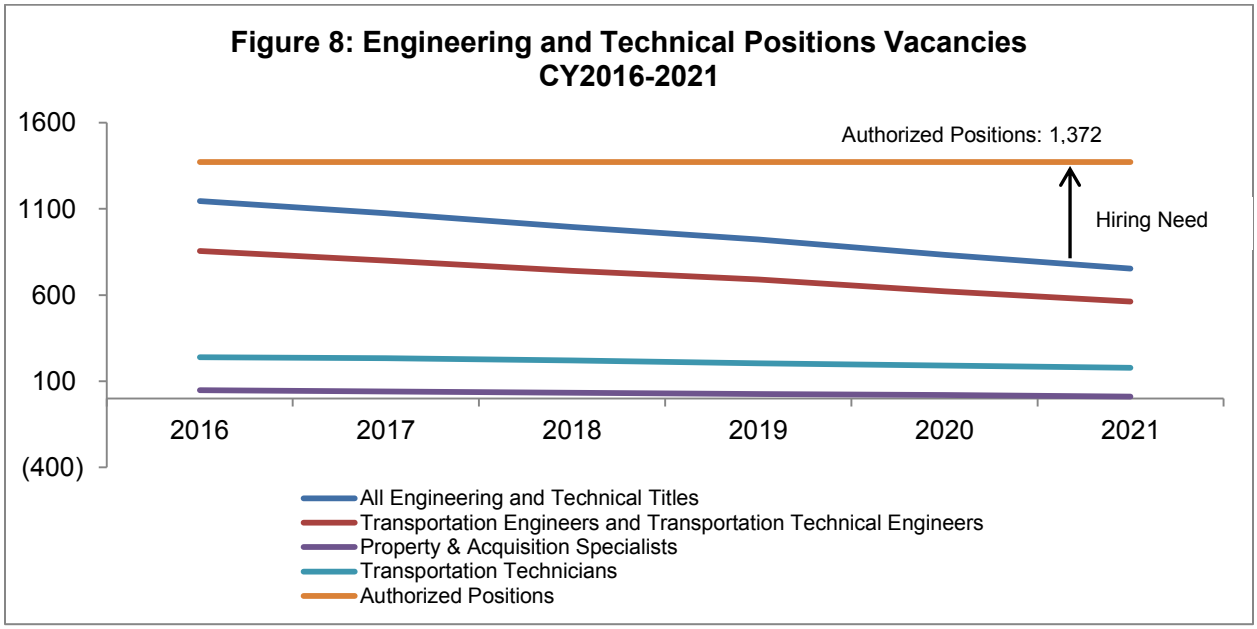
Resignations: Resignations are the most difficult factor to project. As previously shown, recent attrition has increased from 1.3 percent of all employees in 2013 to 3.4 percent in 2015. Based on attrition data provided by WSDOT, many of the employees who resign are leaving for employment with nearby local governments.

It is difficult to project the expected hiring of other local agencies and private sector employers. According to the Bureau of Labor Statistics Employment Projections (EP) program, employment in the local government sector is expected to grow by approximately 4.3 percent between 2014 and 2024, with 5.6 percent growth among civil engineers within local government. Similarly, employment in the engineering services sector is expected to grow by 10.7 percent over the same period, with slightly higher growth for civil engineers (11.7 percent).[11] These figures can be taken as an indication of strong hiring expectations among WSDOT's competitors.

Non-Voluntary Attrition: These separations include all forms of non-planned attrition, including disciplinary dismissals, disability, and death, which have averaged about two per year over the last three years.

Vacancies for All Classifications

Figure 8 shows WSDOT will lose a little over 45 percent of its workforce to projected retirements, resignation, and non-voluntary attrition between January 1, 2016 and December 31, 2021. This projection does not include any planned hiring.



This loss of staff must be addressed with new and aggressive hiring for positions in the benchmark classifications. This turnover also indicates a loss of knowledge within the agency that will be difficult to replace, as most attrition is from seasoned employees.

Vacancies in Supervisory Positions

Perhaps more important than vacancies for classifications as a whole are the vacancies in the supervisory classifications – Transportation Engineer 3, 4 and 5, Transportation Technical

[11] Bureau of Labor Statistics, Employment Projection (EP) Program, National Employment Matrix – Industry, 2014-2024 (most recent data available)

Engineer, and Property & Acquisition Specialists 5 and 6. As shown in **Table 9** below, projected turnover in these classifications by 2021 is staggering. Without sufficient hiring, WSDOT will lose most, if not all, of their current supervisory workforce to attrition by 2021. With these employees goes the institutional knowledge that is critical to training a new generation of employees in the benchmark classifications.

Table 9: Supervisory Titles Vacancy Rates, CY2016-2021

	2016	2017	2018	2019	2020	2021
All Supervisory Titles	-13.6%	-23.1%	-32.5%	-40.8%	-50.9%	-61.5%
Transportation Engineer 3	-7.0%	-8.5%	-11.9%	-16.9%	-20.9%	-24.4%
Transportation Engineer 4	-9.2%	-17.6%	-26.9%	-34.5%	-44.5%	-53.8%
Transportation Engineering 5	-25.0%	-37.5%	-50.0%	-62.5%	-81.3%	-93.8%
Transportation Technical Engineer	-15.3%	-17.6%	-22.4%	-28.2%	-31.8%	-35.3%
Property & Acquisition Specialist 5	-29.0%	-41.9%	-54.8%	-67.7%	-77.4%	-96.8%
Property & Acquisition Specialist 6	0.0%	-33.3%	-33.3%	-33.3%	-33.3%	-33.3%

Most supervisory positions are filled from within the agency. Therefore, high turnover in lower-level jobs will significantly impact the recruitment pool for these positions. Succession planning will be critical to maintain institutional knowledge and encourage retention. The agency will need to begin hiring now to "backfill" for these employees. This not only raises the question of hiring but also that of training new employees.

Projection Implications

The projections above have significant implications for WSDOT's recruitment and retention efforts.

Significant hiring needs in 2016: In order to adequately staff a substantial increase in project work during the 2017-2019 biennium, WSDOT will need to hire a significant number of new employees into current classification allocations. To fill existing vacancies and expected attrition by the end of Calendar Year 2016, WSDOT will need to hire about 227 people.

Additional hiring through 2021: Over the next five years, year-to-year hiring needs will remain modest. As shown in **Table 10**, WSDOT will need to hire a little over 100 people a year to maintain its current authorized level of positions. In total, from 2016 to 2021, the agency will need to hire over 600 people. More importantly, the agency will need to hire to fill the positions of supervisory employees who may leave in significant numbers through 2021. This will create a training issue for those employees just entering the agency. This may also mean that the agency will need to target hiring of already-seasoned staff. This will put more emphasis on pay than for entry-level employees.

Table 10: CY2016-2021 Hiring Needs (All Classifications)

	2016	2017	2018	2019	2020	2021
Cumulative	227	298	377	450	538	619
Year-by-Year	227	71	79	73	88	81

Hiring to backfill for retirements beyond 2021: As the number of projected retirements increases after 2021 (see **Appendix C**), hiring needs will also increase. As shown in **Table 11,** from 2022 to 2026 the agency will be required to hire an average of 106 people per year, or a total of 544 people to maintain authorized staffing levels. While not in this report's analysis period, it is important to show that a high level of projected recruitment effort will be ongoing for the next decade at least for the purposes of devising recruitment strategies.

Table 11: CY2016-2026 Hiring Needs (All Classifications)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Cumulative	227	298	377	450	538	619	722	831	949	1058	1163
Year-by-Year	255	71	79	73	88	81	103	109	118	109	105

CONCLUSION

Over the next five years, WSDOT is projected to lose just over 45 percent of its workforce in the benchmark classifications to retirement, resignation, and other non-voluntary attrition. This will lead to increased and ongoing hiring of engineers and technical personnel. This will result in opportunities for promotions for many existing staff, but will result in a large influx of largely untrained new employees into entry-level positions. At the same time, the recent passage of a $16 billion construction bill will begin to change the type of work that these jobs are needed for. While there may be increased direct project work, there will also be a need to manage consulting contracts as well. This will create additional issues in identifying the different skill sets needed in the future as well as how to on-board and train these new employees.

Chapter 2: WSDOT Compensation

This chapter will lay out the overall compensation plan for WSDOT benchmark classifications being addressed in this report. Compensation is broadly classified into cash compensation and non-cash benefits. The details of each of the broad classifications are provided below.

Classification Descriptions

The benchmark classifications in this analysis fall within the scope of engineering and technical positions at WSDOT. Brief descriptions of each classification are provided below:

- **Transportation Engineers:** Performs transportation engineering work in the areas of survey, design, construction, traffic, marine, and materials.
- **Transportation Technical Engineers:** Manages highly specialized technical engineering programs or functions as a senior technical program specialist.
- **Transportation Technicians:** Perform technical tasks in support of engineering projects and program in the areas of survey, materials, inspection, bridges and structures, traffic, maintenance, and administration
- **Property & Acquisition Specialists:** Perform specialized activities in real or personal property including appraisals, audits, property management, negotiations, relocation, title examination, acquisition, leasing, valuation, and project management

All but three classifications are subject to collective bargaining through the Professional and Technical Employees (PTE) Local 17. The current agreement is effective through June 30, 2017.

PTE Local 17	Non-Represented Employees
Transportation Engineer 1-3 Transportation Technician 1-3 Property & Acquisition Specialist 1-6	Transportation Engineer 4-5 Transportation Technical Engineer

Cash Compensation

Cash compensation is comprised of any pay that results in direct pay to an employee. This is inclusive of base pay, specialty pays, and overtime.

Base pay, longevity, and pay progression

WSDOT engineering and technical employees are paid according to the general service salary scale. This scale contains 12 progression steps which employees move through up to the maximum base pay.

WSDOT engineering and technical employees are provided approximately 2.5 percent longevity after 6 years at maximum step. This 2.5 percent comes in the form of an additional step (Step M) on the pay scale, rather than a straight percentage addition to base pay.

Table 12: WSDOT Engineering and Technical Benchmark Classifications Base Compensation + Longevity

	Minimum	Midpoint	Maximum	Maximum + Longevity
Transportation Engineer 1	$44,880	$51,462	$58,956	$60,420
Transportation Engineer 2	$49,608	$55,440	$65,088	$66,684
Transportation Engineer 3	$54,744	$64,284	$71,844	$73,644
Transportation Engineer 4	$60,420	$69,234	$79,296	$81,264
Transportation Engineer 5	$66,684	$76,398	$87,528	$89,712
Transportation Technical Engineer	$66,684	$76,398	$87,528	$89,712
Transportation Technician 1	$34,476	$39,228	$44,880	$46,056
Transportation Technician 2	$39,708	$45,468	$52,080	$53,424
Transportation Technician 3	$44,880	$51,462	$58,956	$60,420
Property & Acquisition Specialist 1	$34,476	$39,228	$44,880	$46,056
Property & Acquisition Specialist 2	$40,704	$46,632	$53,424	$54,744
Property & Acquisition Specialist 3	$46,056	$52,752	$60,420	$61,920
Property & Acquisition Specialist 4	$49,608	$56,826	$65,088	$66,684
Property & Acquisition Specialist 5	$53,424	$61,170	$70,056	$71,844
Property & Acquisition Specialist 6	$56,136	$64,284	$73,644	$75,456

Employees in each classification are placed on the step that best corresponds to their years of experience and skills; thus, not every employee begins at the first step of the salary range for that classification. Employees advance two steps on their Periodic Increment Date each year. An employee hired at Step A will advance to Step L in five and one-half years.

Shift Differential

Shift differential pay is provided to employees who work a shift other than the typical day shift. The State provides a shift differential of $0.65 per hour when an employee is scheduled to work a shift in which the majority of hours worked daily or weekly are between 6:00pm and 6:00am. Shift differential earned while in overtime status is 1.5x the $0.65/hour premium. In Calendar Year 2015, 15.9 percent (212 employees) received shift differential for non-overtime hours,

averaging $204 in CY2015, while 8.5 percent (114 employees) received overtime shift differential, averaging approximately $60.

Overtime

The State of Washington provides time-and-a-half pay in accordance with the Fair Labor Standards Act for all hours of work occurring before or after a shift or on a regular day off. Transportation Engineers 1-3, Transportation Technicians 1-3, and Property & Acquisition Specialists 1-6 are all overtime eligible. In Calendar Year 2015, 59.4 percent of employees in the benchmark classes received overtime (794 employees). For those receiving this premium, overtime pay averaged $3,476 in CY2015.

Call Back, Standby, and Schedule Change Penalty Pays

Under the Local 17 agreement, bargaining unit employees are also offered the following additional pays:

- **Call Back Pay:** This pay is provided to overtime-eligible employees when called back to work after their regular shift without receiving prior notice. In Calendar Year 2015, 101 employees in the benchmark classifications received this pay, averaging $251.

- **Standby Pay:** This pay is provided to employees waiting to be engaged in work at a specific location or prepared to report immediately for work. Overtime-eligible employees are compensated at 7 percent of hourly base salary for hours in standby status. In Calendar Year 2015, only 1.2 percent (16 employees) received this pay, averaging $1,748. Overtime-exempt employees are compensated at $25/day spent in standby status. In Calendar Year 2015, only 3 employees in the benchmark classifications received this pay, averaging $4,658.

- **Schedule Change Penalty Pay:** Employees receive an amount of half their hourly rate when they do not receive appropriate notice of a change to their work schedule. In Calendar Year 2015, 118 employees in the benchmark classifications received this pay, averaging $192.

Holiday Pay

All of the WSDOT employees in the benchmark classifications also receive ten paid holidays plus one paid personal holiday per year. This pay averaged $2,963 for all benchmark employees. Local 17 represented employees receive an additional personal leave day each fiscal year.

Assignment Pays

WSDOT employees in certain classifications are eligible for a range of assignment pays. Transportation Engineers and Technicians are eligible for assignment pays based on the type of work performed.

Table 13: WSDOT Assignment Pays

	Type of Pay	Pay Amount	# of Employees Receiving as of 12/31/2015	Average Pay as of 12/31/2015
Transportation Engineer 1-3 Transportation Technician 1-3	Bridge Painting Inspection Duty	10.0% of base pay for hours worked in this capacity	4	$861
Transportation Engineer 2-3 Transportation Technician 1-3	Under-Bridge Inspection Truck (UBIT) Operation	10.0% of base pay for hours worked in this capacity	3	$562

Employees who are classified as Transportation Engineer 3 and are working as cadastral surveyors, as well as Property & Acquisition Specialists are eligible for assignment pay based on their geographic location. These pays range from 2.5 to 10.0 percent, depending on classification, and were instituted to counteract recruitment and retention issues for these classifications.

Table 14: WSDOT Geographic Assignment Pay

	Regions	Pay Amount	# of Employees Receiving as of 12/31/2015	Average Pay as of 12/31/2015
Property & Acquisition Specialist 1	Northwest	2.5%	1	$360
Property & Acquisition Specialist 2	Eastern Headquarters Northwest Olympic	5.0%	1	$1,802
Property & Acquisition Specialist 3 Transportation Engineer 3 (Cadastral Surveyors)	PAS: Eastern Headquarters Northwest Olympic Transportation Engineers: Northwest Region and Urban Corridors Office	10.0%	29	$4,585
Property & Acquisition Specialist 4-6	Eastern Headquarters Northwest Olympic	7.5%	26	$4,308

Note: 10.0% assignment pay for Property & Acquisition Specialists 3 and Transportation Engineers 3 could not be separated by classification

Stipends and Allowances

WSDOT provides stipends to employees for business use of their personal cell phone in lieu of a state-issued device. The amount of these stipends and the number of WSDOT employees receiving them are shown in **Table 15**.

Table 15: WSDOT Stipends and Allowances

	Pay Amount	# of Employees Receiving as of 12/31/2015	Average Pay as of 12/31/2015
Cell Phone Stipend	Voice: $10/month Data: $30/month Voice and data: $40/month	96	$275
Commute Incentive	Varies based on how employee choses to commute – transit fare, carpool incentive	159	$139

WSDOT Earnings in Context

In comparison to the overall Washington State labor market, a career at WSDOT provides competitive wages. According to the U.S. Census Bureau, the median household income in Washington State for individuals age 25 and over with a high school diploma was $31,016 as of 2014. Individuals with some college or an associate degree had a median household income of $35,409 and individuals with a bachelor's degree earned $54,844 per year.[12] While the WSDOT engineering and technical jobs require a high level of expertise and on-the-job training, total pay is reasonable compared to statewide averages.

[12] U.S. Census Bureau, American Community Survey, 2014, 1-Year Estimates

Non-Cash Benefits

Leave

In addition to cash compensation, WSDOT employees receive vacation leave allowances based on years of service, as detailed in the chart below. Including personal leave, these employees receive between 104 and 184 hours of regular leave per year.

Table 16: WSDOT Vacation Leave Allowances

	Completed Years of Service	Hours of Leave
Vacation Leave	0 YOS	96 hours
	1 YOS	104 hours
	2-3 YOS	112 hours
	4-6 YOS	120 hours
	7-9 YOS	128 hours
	10+ YOS	Additional 8 hours of leave for each additional YOS, to a maximum of 176 hours
Personal Leave[13]	All years of service	8 hours

WSDOT employees also receive ten paid holidays plus one personal holiday per year. If required to work during a holiday, employees receive pay at the overtime (1.5x) rate for actual hours worked in addition to the straight-time rate for the hours they are regularly scheduled to work on that day.

Other forms of paid leave include severe inclement weather/natural disaster leave, jury duty leave, bereavement leave, volunteer leave, military leave, work-related injury/illness leave, and sick leave.

[13] Personal leave is granted to all PTE Local 17 employees after four months of employment. It must be used in the fiscal year it is granted and cannot be carried over to the following fiscal year.

Health Benefits

All active participating Washington State employees contribute an average of 15 percent of the premium toward health care coverage. This percent contribution is based on the total weighted average of the projected health care premiums. The projected health care premiums are weighted averages across all plans and all tiers.

Table 17: Washington Employee Contribution to Health Care Coverage Plan Year 2016

	Highest-Enrolled HMO		Highest-Enrolled PPO/POS	
	Individual	Family	Individual	Family
Percent of Premium	14.3%	14.9%	14.7%	15.4%
Monthly Premium (2016)	$81.00	$233.00	$84.00	$241.00

Note: The referenced highest-enrolled HMO is the Group Health Value plan and the highest-enrolled PPO is the Uniform Medical Plan Classic plan.

In comparison, the typical employee premium contribution for workers in Washington State private industry (establishments of 50 or more employees) was 18.1 percent for individual coverage and 26.5 percent for family coverage in 2014.[14]

In addition, retired WSDOT employees who are not yet Medicare-eligible receive access to the same medical plan offerings as active employees, but pay the full cost of coverage. Medicare-eligible retirees have different plan options (including Medicare advantage and supplement options) and are provided a subsidy of 50 percent of the plan premium or $150 per month, whichever is less.

Pension Benefits

WSDOT employees participate in the Washington State Public Employees' Retirement System (PERS).

The PERS system has three plans, as shown in the table below. Plans 1 and 2 are traditional defined benefit plans. Plan 1 was closed to new enrollment on October 1, 1977. The majority (80.8 percent) of employees in the benchmark classifications are in PERS Plan 2, which can be elected over PERS Plan 3 for all employees hired on or after March 1, 2002. Plan 3 is defined benefit plan (traditional pension) with a defined contribution component.[15]

[14] U.S. Department of Health and Human Service, Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2014

[15] Members of PERS Plans 2 and 3 have the option to retire early and begin receiving a monthly benefit as early as age 55 with 20 YOS (Plan 2) or age 55 with 10 YOS (Plan 3). The employee's benefit is reduced based on their age at early retirement.

Table 18: Washington State DOT Retirement Benefits

	Membership	Normal Retirement Eligibility	Employee Contribution	Benefits Formula	FAS Period	% of Benchmark Employees in Tier (as of 12/31/2015)
Public Employees' Retirement System Plan 1	Hired before October 1, 1977	Age 55 with 25 YOS, Age 60 with 5 YOS, or Any Age with 30 YOS	6.00%	2.0% x AFC x YOS (capped at 30 YOS)	24 months	1.1%
Public Employees' Retirement System Plan 2	Hired on or after October 1, 1977 and selected Plan 2	Age 65 with 5 YOS	6.12%	2.0% x AFC x YOS	60 months	80.8%
Public Employees' Retirement System Plan 3 *Defined Benefit Plan with Defined Contribution component*	Hired on or after March 1, 2002 and selected Plan 3	Age 65 and 10 YOS	DB: 0% DC: Six rate options ranging from 5% to 15%	DB: 1.0% x AFC x YOS DC: based on market returns	60 months	18.1%

YOS = Years of Service

FAS = Final Average Salary

Total Cost to Employer

The major costs to WSDOT for an employee in one of the four most populous classifications – Transportation Engineer 2, Transportation Technical Engineer, Transportation Technician 3, and Property & Acquisition Specialist 5 – including all cash earnings and the largest benefit categories, are shown in **Table 19** below.

Table 19: Total Employer Cost

	Total Cash Compensation	Pension Contribution (11.18%)	Insurance Benefits Cost	Social Security	Medicare	Total Employer Cost
Property & Acquisition Specialist 5	$83,915	$8,978	$15,984	$5,203	$1,217	$115,297
Transportation Engineer 2	$85,020	$9,174	$15,984	$5,271	$1,233	$116,682
Transportation Technical Engineer	$98,100	$10,624	$15,984	$6,082	$1,422	$132,213
Transportation Technician 3	$72,300	$7,768	$15,984	$4,483	$1,048	$101,583

Total cash compensation is derived from actual Calendar Year 2015 payroll data and is the average of annual salary, overtime, shift differential, assignment pay, and other stipends and allowances paid to engineering and technical employees in that fiscal year.

Benefits in the above table include the employer contribution to PERS Plan 2 and 3 (11.18 percent as of 7/1/2015). The table also includes the employer portion of the health insurance premium for family coverage regardless of plan selection and payroll taxes (Medicare and Social Security).

Compression/Inversion

Office of Financial Management State Human Resources seeks to maintain a reasonable differential between the highest subordinate and the supervisor level in each classification. The amount of differential may vary depending on the difference in the level of responsibility, skill level or qualifications such as between a lead worker and the supervisor or if the subordinate is required to have a license and/or use higher level technical skills.

As shown in the analysis below, WSDOT currently maintains above a 10 percent differential for supervisory positions in all but one classification group, the Property & Acquisition Specialists.

Transportation Engineers and Transportation Technical Engineers

The highest subordinate classification in the Transportation Engineer series is the Transportation Engineer 2. Transportation Engineer 3s, 4s, and 5s and Transportation Technical Engineers supervise lower Transportation Engineers. As shown in **Table 20**, current compensation for these classifications maintains over a 10 percent differential between subordinate and supervisor.

Table 20: Transportation Engineer and Transportation Technical Engineer Compression/Inversion Analysis

	Minimum	Midpoint	Maximum	Maximum + Longevity
Percent Difference in Base Pay Over Preceding Classification				
Transportation Engineer 3	10.4%	10.3%	10.4%	10.4%
Transportation Engineer 4	10.4%	10.4%	10.4%	10.3%
Transportation Engineer 5/ Transportation Technical Engineer	10.4%	10.3%	10.0%	10.4%

Transportation Technicians

The Transportation Technician series leadership responsibility is normally limited to on-the-job training of other staff or crew lead. Transportation Technicians are typically supervised by Transportation Engineer 3s. As shown in **Table 21**, The differential between the Transportation Technician 3 and the Transportation Engineer 3 is just under 22 percent at maximum base + longevity.

Table 21: Transportation Technician Compression/Inversion Analysis

	Minimum	Midpoint	Maximum	Maximum + Longevity
Percent Difference in Base Pay from Transportation Engineer 3				
Transportation Technician 3	22.0%	21.8%	21.9%	21.9%

Property & Acquisition Specialists

The highest subordinate classification in the Property & Acquisition Specialist series is the Property & Acquisition Specialist 4. Property & Acquisition Specialists 5-6 supervise lower Property & Acquisition Specialists. As shown in **Table 22**, the differential between the 4 and 5, and 5 and 6 do not meet this preferred differential.

Table 22: Property & Acquisition Specialist Compression/Inversion Analysis

	Minimum	Midpoint	Maximum	Maximum + Longevity
Percent Difference in Base Pay Over Preceding Classification				
Property & Acquisition Specialist 4	7.7%	7.7%	7.7%	7.7%
Property & Acquisition Specialist 5	7.7%	7.6%	7.6%	7.7%
Property & Acquisition Specialist 6	5.1%	5.1%	5.1%	5.0%

COMPARISON TO LOCAL GOVERNMENT EMPLOYERS

To benchmark compensation, the project team chose a variety of local public employers based on size, location, and number of WSDOT employees who have left for a given agency in 2013 through 2015. Benchmarked employers are shown in **Table 23**.

Table 23: Comparable Jurisdictions

	Population Served	Full-Time Equivalents
WSDOT	**7,061,530**	**6,894**
Clark County	451,008	1,600
King County	2,079,967	12,997
Pierce County	831,928	3,001
Seattle	668,337	12,068
Sound Transit [1]	3,671,478	748
Spokane County	484,318	2,016
Spokane	212,067	2,086
Vancouver	169,303	976

[1] Sound Transit: Population figure reflects total population of area serviced (King, Pierce, and Snohomish Counties)

To evaluate relative compensation, the project team developed and circulated a detailed survey instrument (see **Appendix A**), and collected and reviewed key documents (e.g., pay plans and collective bargaining agreements and job descriptions) covering the benchmark classifications listed above. Unless otherwise noted, all analysis was conducted to compare compensation and benefits as of June 30, 2016.

Comparisons across employers are often imprecise due to differences in economic base and ability to pay, organizational structure, working conditions, types of duties assigned, qualification and skill requirements, and other relevant factors that may vary for similar classifications. The best job match across employers is often not a perfect match, and such variations may contribute to some reported differences in relative compensation.

To achieve reasonable and generally useful matches, summaries were prepared from State of Washington classification specifications and incorporated into the questionnaire to assist participants in matching their jobs to the State's benchmark jobs. In some cases, no match was available. In other cases, again, matches provided were for similar but not identical jobs

The project team followed up with phone calls and emails to clarify many written survey responses, and conducted independent analysis of job descriptions towards identifying the most

relevant job matches. In general, however, our findings rely on the matches provided by the survey participants. Because such matches vary in "closeness of fit" to the State's job classifications, it is likely that some outlier pay rates reported may result from relatively weak matches. Greater weight should generally be given to survey medians and modes, and minor variances (approximately 5% or less) may not be significant.

It is important to note that wage comparison tables below and in the appendix only include wage levels for comparable jurisdictions that reported a job match.

Base Pay

The elements of compensation used for benchmarking the WSDOT and comparative agencies include base pay and longevity (at applicable junctures). Additional cash compensation, which may not be received by all classifications in all jurisdictions, is detailed later in this section, but not included in compensation comparisons with other jurisdictions. Highly variable forms of cash compensation (e.g., overtime) and premiums that may not be received by a typical employee are not included in the benchmarking that follows due to the difficulty of presenting such pays on an apples-to-apples basis.

Again, it is important to note comparisons across employers are often imprecise due to differences in economic base and ability to pay, organizational structure, working conditions, types of duties assigned, qualification and skill requirements, and other relevant factors that may vary for similar jobs. The best job match across employers is often not a perfect match, and such variations may contribute to some reported differences in relative compensation.

Shown below are summary tables detailing the median compensation, WSDOT's variance from that median, and WSDOT's rank for each classification at ***maximum base plus longevity***.[16] More detailed tables that include the actual compensation levels for each jurisdiction at all pay junctures (minimum, midpoint, maximum, maximum base plus longevity) are shown in **Appendix D**.

[16] This pay juncture was chosen based on the fact that most WSDOT employees are at maximum base plus longevity as of 12/31/2015.

Transportation Engineers and Transportation Technical Engineers

Most comparable jurisdictions surveyed provided classification matches for each of the Transportation Engineer and Transportation Technical Engineer classifications. The comparison of base compensation between the WSDOT and these jurisdictions shows that the agency lags the multi-jurisdictional median at maximum base plus longevity by anywhere from 13.5 to 29 percent.

Table 24: Transportation Engineer Wage Comparisons

	WSDOT Maximum Base + Longevity	Median at Maximum Base + Longevity	WSDOT Variance from Median	Rank
Transportation Engineer 1	$60,420	$69,823	-13.5%	6 of 6
Transportation Engineer 2	$66,684	$87,996	-24.2%	6 of 6
Transportation Engineer 3	$73,644	$93,903	-21.6%	7 of 7
Transportation Engineer 4	$81,264	$113,464	-28.4%	8 of 8
Transportation Engineer 5	$89,712	$126,403	-29.0%	7 of 7
Transportation Technical Engineer	$89,712	$89,958	-0.3%	3 of 3

Only two jurisdictions – Sound Transit and Spokane County – reported a job match for the classification of Transportation Technical Engineer. Because of the small number of matches, comparisons shown in the table below must be taken with caution.

WSDOT's compensation is, again, at or near the bottom of this comparison group, however the agency's variance from the median is smaller – only 0.3 percent at maximum base plus longevity.

Transportation Technicians

WSDOT compensation for the Transportation Technician classifications is at or near the bottom at all pay junctures (see **Appendix D** for full tables). The comparison of base compensation between the WSDOT and these jurisdictions shows that the agency lags the median at maximum base plus longevity by anywhere from 16.2 to 25.5 percent.

Table 25: Transportation Technician Wage Comparisons

	WSDOT Maximum Base + Longevity	Median at Maximum Base + Longevity	WSDOT Variance from Median	Rank
Transportation Technician 1	$46,056	$54,954	-16.2%	6 of 6
Transportation Technician 2	$53,424	$65,291	-18.2%	7 of 7
Transportation Technician 3	$60,420	$81,140	-25.5%	6 of 6

Property & Acquisition Specialists

WSDOT compensation for the Property & Acquisition Specialist classifications is at or near the bottom at all pay junctures (see **Appendix D** for full tables). The comparison of base compensation between the WSDOT and these jurisdictions shows that the agency lags the median at maximum base plus longevity by anywhere from 13.9 to almost 34 percent.

Table 26: Property & Acquisition Specialist Wage Comparisons

	WSDOT Maximum Base + Longevity	Median at Maximum Base + Longevity	WSDOT Variance from Median	Rank
Property & Acquisition Specialist 1	$46,056	$67,748	-32.0%	4 of 5
Property & Acquisition Specialist 2	$54,744	$82,813	-33.9%	5 of 6
Property & Acquisition Specialist 3	$61,920	$91,009	-32.0%	6 of 7
Property & Acquisition Specialist 4	$66,684	$94,271	-29.3%	5 of 5
Property & Acquisition Specialist 5	$71,844	$91,426	-21.4%	7 of 7
Property & Acquisition Specialist 6	$74,456	$87,673	-13.9%	3 of 3

Geographic Assignment Pay. Property & Acquisition Specialists and Transportation Engineering 3s working as Cadastral Surveyors are among the only classifications eligible for geographic assignment pay. **Table 27** shows maximum base pay plus longevity with and

without applicable geographic assignment pay for each classification in the series. This amount is then compared to the median maximum base plus longevity for the group of comparison jurisdictions that falls in the WSDOT regions for which assignment pay is granted. For example, only Property & Acquisition Specialist 1s in the northwest region receive 2.5% geographic assignment pay, therefore only King County, Seattle, and Sound Transit were included in that median calculation even though other jurisdictions outside of the Northwest region provided job matches. Because there are only two matches for the Property & Acquisition Specialist 6, no comparison was made for this classification.

Table 27: Property & Acquisition Specialist Pay with Assignment Pay

	Maximum Base + Longevity	Median	Variance from Median
Property & Acquisition Specialist 1	$45,056	$67,748	-33.5%
w/ 2.5% assignment pay	**$46,182**	**$75,176**	**-38.6%**
Property & Acquisition Specialist 2	$54,744	$82,813	-33.9%
w/ 5.0% assignment pay	**$57,481**	**$83,506**	**-31.2%**
Property & Acquisition Specialist 3	$61,920	$91,009	-32.0%
w/ 10.0% assignment pay	**$68,112**	**$92,390**	**-26.3%**
Property & Acquisition Specialist 4	$66,684	$94,271	-29.3%
w/ 7.5% assignment pay	**$71,685**	**$94,271**	**-24.0%**
Property & Acquisition Specialist 5	$71,844	$91,426	-21.4%
w/ 7.5% assignment pay	**$77,232**	**$91,427**	**-15.5%**

As **Table 27** shows, inclusion of assignment pay improves WSDOT's variance from the multi-jurisdictional median for the Property & Acquisition Specialist 3 and 5, but the variance from the median worsens for the 1, 2, and 4, in some cases by a substantial amount. This indicates that, even with this assignment pay – which was instituted to improve recruitment and retention – wages are lagging that of the labor markets in which they are applicable.

Additional Compensation

Like WSDOT, many of the comparable employers surveyed offer additional opportunities for compensation. These additional pays are outlined below. The project team did not collect information regarding how many employees in the benchmark classifications receive these pays and in what amounts.

Shift Differential

All but three comparable jurisdictions offer shift differential pay to all or some of their engineering and technical titles.

Table 28: Shift Differential at Local Washington Employers

	Shift Differential
WSDOT [1]	**$0.65 per hour when an employee if scheduled to work a shift in which the majority of hours worked daily or weekly are between 6:00pm and 6:00am**
Clark County [2]	Regular shift begins after 2:00pm: $1.25/hour
King County	$1.00/hour
Pierce County	-
Seattle	$0.70/hour and $1.10/hour for shifts/hours determined by individual office policy
Sound Transit	-
Spokane	Engineering Technicians 4:00pm - 12:00am: $0.35/hour 12:00am - 8:00am: $0.70/hour
Spokane County	-
Vancouver	3:00pm - 12:00am: $1.50/hour 10:00pm - 6:00am: $1.75/hour

[1] WSDOT: All benchmark classes are eligible for shift differential
[2] Clark County: Employees regularly scheduled to work Saturdays will also receive an additional $1.25 per hour for all hours worked between midnight Friday and midnight Saturday

Overtime

Most comparable employers offer overtime pay at 1.5 times the employee's regular hourly rate. This time can be taken as either pay or leave.

Table 29: Overtime at Local Washington Employers

	Overtime Rate of Pay	Pay/Leave
WSDOT	**1.5x**	**Pay or Leave**
Clark County [1]	1.5x	Pay or Leave
King County	1.5x	Pay or Leave
Pierce County [2]	1.5x	Pay or Leave
Seattle	1.5x	Pay
Sound Transit	1.5x	Pay
Spokane	1.5x	Pay or Leave
Spokane County	1.5x	Pay
Vancouver	1.5x	Pay

[1] Clark County: Employees may choose to be compensated with compensatory time off up to a maximum of 80 hours

[2] Pierce County: Overtime details applicable to engineering titles only

Specialty and Assignment Pays

None of the benchmarked jurisdictions provided any type of specialty or assignment pay for specific types of work or work assignments. Additionally, none of the local governments provided any type of geographic assignment pay.

Pension Benefits

As previously discussed, WSDOT employees participate in the Washington State Public Employees' Retirement System (PERS). New hires are offered the option of enrolling in PERS Plan 2 or 3.

Five comparable jurisdictions participate in PERS, while Seattle, Sound Transit, and Spokane provide their own retirement plans. Sound Transit's plan is a 401(a) defined contribution plan, not a traditional defined benefit pension.

As shown in **Table 30**, WSDOT employees are provided better retirement benefits than those local government employees who are not enrolled in PERS. WSDOT employees contribute the

lowest percentage of pay to their defined benefit plans and their contributions to the defined contribution portion of the PERS 3 Plan are set by the employee, compared to Sound Transit, where employees are required to contribute 10 percent.

Table 30: WSDOT and Local Washington Employer Pension Benefits

	Plan Name	Employee Contribution	Normal Retirement Eligibility	Benefit Formula
WSDOT Clark County, King County, Pierce County, Spokane County, Vancouver	**PERS Plan 1** *(Hired before October 1, 1977)*	**6.00%**	**Age 55 with 25 YOS, Age 60 with 5 YOS, or Any Age with 30 YOS**	**2.0% x AFC x YOS**
WSDOT Clark County, King County, Pierce County, Spokane County, Vancouver	**PERS Plan 2** *(Hired on or after October 1, 1977 and selected Plan 2)*	**6.12%**	**Age 65 with 5 YOS**	**2.0% x AFC x YOS**
WSDOT Clark County, King County, Pierce County, Spokane County, Vancouver	**PERS Plan 3** *(State gov't: Hired on or after March 1, 2002, Local gov't: Hired on or after September 1, 2002 and selected Plan 3)*	**DB: 0% DC: Six rate options ranging from 5% to 15%**	**Age 65 with 10 YOS**	**Defined Benefit: 1.0% x AFC x YOS + Defined Contributions and Investment Returns**
Seattle	Seattle City Employees' Retirement System	10.03%	Age 62 with 5 YOS, Age 57 with 10 YOS, Age 52 with 20 YOS, or Any Age with 30 YOS	Greater of 1) percent of AFC based on age and YOS at retirement ranging from 9.10 to 60% or 2) two times the employee contribution with interest
Sound Transit	Sound Transit 401a (Defined Contribution)	10% (12% employer match)	Age 55 with 4 YOS	Employee and Employer Contributions + Investment Returns
Spokane	Spokane Employees' Retirement System	7.75%	Normal Retirement Age: 65 Age + YOS must equal 80	2.0% x AFC x YOS (maximum 35 YOS)

YOS = Years of Service

AFC = Average Final Compensation

Health Benefits

The table below provides a summary of the percent of premium contributed by local engineering and technical employees in Washington. Based on this comparison, WSDOT employees contribute among the highest percentages of premium toward health care coverage under both the highest-enrolled HMO plan and PPO/POS plan offered to employees at each agency.

Table 31: Local Washington Employers
Employee Percent of Premium for Health Insurance (New Hires)
Effective 6/30/2016

	Highest-Enrolled HMO		Highest-Enrolled PPO	
	Individual	Family	Individual	Family
WSDOT [1]	**14.3%**	**14.9%**	**14.7%**	**15.4%**
Clark County	7.0%	7.0%	7.0%	7.0%
Pierce County	5.9%	5.9%	5.9%	5.9%
King County	0.0%	0.0%	0.0%	0.0%
Seattle	4.2%	8.5%	4.7%	9.7%
Sound Transit	0.0%	10.9%	0.0%	10.0%
Spokane	0.0%	18.0%	0.0%	15.3%
Spokane County	5.0%	10.0%	5.0%	10.0%
Vancouver	5.3%	14.3%	4.7%	14.2%
Median (excluding WSDOT)	**4.6%**	**9.3%**	**4.7%**	**9.8%**
WSDOT Variance from Median	**212.2%**	**66.3%**	**212.1%**	**56.6%**
Rank	**9 of 9**	**8 of 9**	**9 of 9**	**8 of 9**

[1] WSDOT: Enrollments do not measure plan comparability in terms of actuarial value or metal tier as defined by the Affordable Care Act.

While the WSDOT percent of premium is at or near the top of the comparison group, it is important to keep in mind that it is below statewide private sector norms. Typical employee premium contribution for workers in Washington State private industry (establishments of 50 or more employees) was 18.1 percent for individual coverage and 26.5 percent for family coverage in 2014.[17]

[17] U.S. Department of Health and Human Service, Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2014

Leave

A significant non-cash benefit provided by public sector employers is leave time. Typically, agencies have a combination of vacation time and personal leave or floating holidays. **Table 32** details the various forms of leave and amounts provided to WSDOT and benchmarked local employers.

Table 32: Local Washington Employers Leave Accrual (Per Year)

	Annual Leave	Personal Leave	Sick Leave	Paid Holidays
WSDOT	**0-1 YOS: 12 days 2 YOS: 13 days 3-4 YOS: 14 days 5-7 YOS: 15 days 8-10 YOS: 16 days 1 additional day of leave per YOS to a maximum of 22 days**	**1/fiscal year**	**12/year**	**11/year**
Clark County	0-1 YOS: 17 days 2-4 YOS: 20 days 5-9 YOS: 23 days 10-14 YOS: 26 days 15-19 YOS: 29 days 20-24 YOS: 32 days 25+ YOS: 35 days	-	-	10/year
King County	0-5 YOS: 12 days 6-8 YOS: 15 days 9-10 YOS: 16 days 11-16 YOS: 20 days 1 additional day of leave per YOS, to a maximum of 30 days	2/year	12/year	10/year
Pierce County	1-3 YOS: 12 days 4-7 YOS: 16 days 8-13 YOS: 20 days 14-18 YOS: 23 days 1 additional day of leave per YOS, to a maximum of 30 days	2/year	12/year	10/year
Seattle	1-4 YOS: 12 days 5-9 YOS: 15 days 10-14 YOS: 16 days 15-19 YOS: 23 days 20-24 YOS: 25 days 25+ YOS: 30 days	2 (4 after 9 YOS)	12/year	10/year
Sound Transit	15 days	-	12/year	10/year
Spokane	0-4 YOS: 12 days 5-10 YOS: 17 days 11 YOS: 18 days 12 YOS: 19 days 13 YOS: 20 days 14 YOS: 21 days 15 YOS: 22 days 20 YOS: 27 days 25 YOS: 29 days 30 YOS: 31 days	4/year	12/year	7/year

	Annual Leave	Personal Leave	Sick Leave	Paid Holidays
Spokane County	0-4 YOS: 12 days 5-9 YOS: 15 days 10-14 YOS: 18 days 15-19 YOS: 21 days 20-24 YOS: 24 days 25+ YOS: 27 days	2/year	12/year	9/year
Vancouver	1-2 YOS: 23 days 3-5 YOS: 28 days 6-10 YOS: 31 days 11-15 YOS: 34 days 16-20 YOS: 36.5 days 21+ YOS: 40 days	-	-	11/year

Table 33 below provides an overview of combined leave times at various years of service for the WSDOT and benchmark local agencies. From one to 15 years of service, WSDOT ranks around the middle of the comparison group in terms of annual leave days, but by 20 years of service, WSDOT is near the bottom of the group and more than 25 percent below the median of 30 annual leave days.

Table 33: Annual Leave by Completed Years of Service

	1 YOS	5 YOS	10 YOS	15 YOS	20 YOS	25 YOS
WSDOT	**12**	**15**	**16**	**21**	**22**	**22**
Clark County	20	23	26	29	32	35
King County	12	12	16	20	24	29
Pierce County	12	16	20	23	23	30
Seattle	12	15	16	23	25	30
Sound Transit	15	15	15	15	15	15
Spokane	12	17	17	22	27	29
Spokane County	12	15	18	21	24	27
Vancouver	22.5	27.5	30.5	33.5	36.5	39.5
Median	**12**	**15**	**17**	**22**	**25**	**30**
WSDOT Variance from Median	**-0.2%**	**0.0%**	**-6.0%**	**-2.4%**	**-10.2%**	**-25.7%**
WSDOT Rank	**5 of 9**	**4 of 9**	**5 of 9**	**4 of 9**	**8 of 9**	**8 of 9**

Sick, civil, educational, parental, disability, bereavement, and military leave are also offered by WSDOT and benchmark local agencies. The usage of these types of leave is more variable and only occurs when needed, so these leaves are not considered in this analysis.

FINDINGS

Finding #1: WSDOT compensation for each classification ranks at or near the bottom of the comparison group at every pay juncture (minimum, midpoint, maximum, and maximum base plus longevity).

Finding #2: WSDOT provides additional opportunities for compensation that are not offered as readily by other jurisdictions in the comparison group, including various assignment pays and geographic assignment pay for select classifications and regions.

Finding #3: Geographic assignment pay offered to the Property & Acquisition classifications and the Transportation Engineer 3 (Cadastral Surveyors) does not improve WSDOT's relative position among the comparison group. In fact, when limiting the comparison group to those jurisdictions that fall in the WSDOT regions where geographic assignment pay is offered, the agency's variance from the group median worsens for three classifications. This indicates that the geographic assignment pay is not having its intended effect of improving recruitment and retention in those classifications.

Finding #4: WSDOT employee contributions to health benefits are among the highest in the comparison group, while employee pension contributions are among the lowest of those jurisdictions that offer a retirement plan other than PERS.

COMPARISON TO OTHER PUBLIC AND PRIVATE SECTOR EMPLOYERS

To evaluate general labor market compensation, the project team relied primarily on third-party data collected for the 2016 State of Washington Total Compensation Survey and the Economic Research Institute (ERI).

State Salary Survey

State Human Resources is required by law to conduct a salary survey to determine the prevailing pay rates for jobs that are comparable to state jobs in the State's public and private sector markets. The recent report was prepared by Segal Consulting.

The 2016 report includes results from 62 organizations, including 23 private sector employers, 26 public sector employers, and 13 state governments. The report contains information on 183 benchmark titles in 15 job families. Classifications within the scope of this report, and included in this survey data, are shown below.

WSDOT Benchmark Classifications	State Salary Survey Matching Classifications
Transportation Engineer 1-5	Civil Engineer 3
Transportation Technician 1-3	Engineering Technician 2
Property & Acquisition Specialist 1-6	Property & Acquisition Specialist 3

Compensation information for the classifications above was collected for in-state public sector respondents and a handful of private sector employers. The tables below show the average minimum, midpoint, and maximum for public sector employers and for all respondents. Private sector employer responses are included in the "All Respondents" line of each table. Only base compensation is reflected and is effective as of July 2015.

Transportation Engineer 3

In comparison to 14 in-state public sector employers and four private sector employers, base compensation for the Transportation Engineer 3 classification lags the market by over nearly 39 percent.

Table 34: Transportation Engineer 3 State Salary Survey Comparison

	Percentage to reach Market (From State Midpoint Range)	Percent to Reach Market (2.5%)
Transportation Engineer 3	38.5%	37.5%

Transportation Technician 2

In comparison to 14 in-state public sector employers and four private sector employers, base compensation for the Transportation Technician 2 classification lags the market by nearly 30 percent.

Table 35: Transportation Technician 2 State Salary Survey Comparison

	Percentage to reach Market (From State Midpoint Range)	Percent to Reach Market (2.5%)
Transportation Technician 2	29.6%	30.0%

Property & Acquisition Specialist 3

In comparison to 14 in-state public sector employers and four private sector employers, base compensation for for the Property & Acquisition Specialist 3 classification lags the market by nearly 49 percent.

Table 36: Property & Acquisition Specialist 3 State Salary Survey Comparison

	Percentage to reach Market (From State Midpoint Range)	Percent to Reach Market (2.5%)
Property & Acquisition Specialist 3	48.8%	50.0%

Economic Research Institute (ERI)

The ERI Salary Assessor is a compensation database with information from public, private, and nonprofit employers. Compensation information within the database is provided based on years of experience as well as level of responsibility. Comparisons below were developed with input from State Human Resources and take into account the agency's typical methodology for using this data. The level of responsibility (see **Appendix E** for level definitions) used for each classification was determined based on job specifications and input from State Human Resources personnel.

WSDOT Benchmark Classification	ERI Matching Title and Level
Transportation Engineer 2	Engineer Civil, Level 2
Transportation Technician 3	Engineering Technician Civil, Level 3
Property & Acquisition Specialist 3	Agent Right-of-Way, Level 2

Compensation comparisons are shown both statewide and for five other locations within the State – Seattle, Spokane, Vancouver, Mount Vernon, and Yakima. These locations were chosen to provide comparisons in differing labor markets throughout the State. Comparisons are made at the 25th percentile and the mean. To align with State HR policy for comparison of this data, the 25th percentile is aligned with the General Service Scale Step A and the mean is aligned with Step L.

The State compares the top step of the salary range, excluding the longevity increase, to the private sector market mean. Step L is the top step for standard progression salary schedules. The market mean reflects the salary needed to align with the average/relative middle of the market. State leaders use tools such as salary surveys to help find the appropriate balance between containing the cost of government operations, compensating state employees fairly, and competing in the job market for employees with the specialized skills and knowledge required to perform the work of state government. A salary survey is one source of data and should be used in conjunction with other workforce factors when informing potential changes to employee pay, benefits or working conditions.

Transportation Engineer 2

The largest discrepancies with the ERI data are seen in the comparison with WSDOT wages for Transportation Engineer 2. WSDOT compensation lags the mean across all geographic areas, with this lag ranging from 16 percent in WSDOT's South Central region (Yakima) to 26.3 percent in the Northwest region (Seattle), where the cost of living is higher.

Table 37: Transportation Engineer 2 ERI Comparison

	25th Percentile	Mean	WSDOT Variance from ERI Mean
WSDOT Transportation Engineer 2	**$49,608**	**$65,088**	**-**
Seattle	$79,836	$88,320	**-26.3%**
Statewide	$76,524	$84,624	**-23.1%**
Vancouver	$75,828	$84,000	**-22.5%**
Mount Vernon	$75,024	$83,052	**-21.6%**
Spokane	$70,032	$77,712	**-16.2%**
Yakima	$69,852	$77,568	**-16.1%**

Transportation Technician 3

Pay discrepancies with the ERI data are more modest for the Transportation Technician 3. Again, WSDOT compensation lags the mean across all geographic areas, with this lag ranging from just 1.0 percent in WSDOT's South Central region (Yakima) to 14.8 percent in the Northwest region (Seattle).

Table 38: Transportation Technician 3 ERI Comparison

	25th Percentile	Mean	WSDOT Variance from ERI Mean
WSDOT Transportation Technician 3	**$44,880**	**$58,956**	**-**
Seattle	$63,084	$69,204	**-14.8%**
Statewide	$60,036	$65,940	**-10.6%**
Mount Vernon	$59,028	$64,980	**-9.3%**
Vancouver	$58,212	$64,044	**-7.9%**
Spokane	$54,348	$59,784	**-1.4%**
Yakima	$54,024	$59,532	**-1.0%**

Property & Acquisition Specialist 3

For the Property & Acquisition Specialist 3 classification, WSDOT again lags the mean across all geographic areas. The lag ranges from 4.0 percent in WSDOT's Eastern region (Spokane) to 15.6 percent in the Northwest region (Seattle).

Table 39: Property & Acquisition Specialist 3 ERI Comparison

	25th Percentile	Mean	WSDOT Variance from ERI Mean
WSDOT Property & Acquisition Specialist 3	**$46,056**	**$60,420**	**-**
Seattle	$65,568	$71,580	**-15.6%**
Mount Vernon	$62,460	$68,352	**-11.6%**
Vancouver	$61,620	$67,404	**-10.4%**
Statewide	$61,128	$66,732	**-9.5%**
Yakima	$58,008	$63,564	**-4.9%**
Spokane	$57,516	$62,916	**-4.0%**

FINDINGS

Finding #5: WSDOT pay lags other public sector and private sector employers by significant margins, as shown in comparisons with data provided in the 2016 State Salary Survey and Economic Research Institute (ERI) data.

Finding #6: The WSDOT classifications are very broad and individuals within each class may experience different competitive opportunities with both governmental and private jobs. Typically, work requiring higher skill levels and employees with Professional Engineer licenses will have more ability to leave the agency for higher-paying jobs.

Recommendations regarding compensation will be addressed in the following chapter.

CONCLUSION

Less competitive wages put the WSDOT in a difficult position from a recruitment and retention perspective, and place a much greater emphasis on the WSDOT's attractiveness as an employer of choice when it comes to non-compensation aspects of the job. Wages are a critical factor in attracting and retaining qualified employees, and the WSDOT needs to address the significant pay differentials to competitive agencies. At the same time, the WSDOT classifications are broad, and it may be more effective to target compensation differences for employees that have the most sought-after skill levels. These issues will be addressed more thoroughly in Chapters 3 and 4.

Chapter 3: Issues Affecting Retention of Engineering Employees

INTRODUCTION

The majority of attrition among WSDOT engineering and technical employees between 2013 and 2015 has been due to retirement or voluntary resignation. Most resignations occur most commonly between six and ten years of service. This is a time where employees are trained, have vested in the pension system, and are better able to take advantage of opportunities offered in outside employment. This chapter identifies and explores the drivers of attrition at WSDOT and outlines several recommendations to improve retention through targeted strategies.

METHODOLOGY

Findings and recommendations in this chapter are largely drawn from the results of both the State of Washington's 2015 employee exit survey and the aforementioned survey of former WSDOT employees in the benchmark classes conducted via Survey Monkey by PFM from April to May 2016. All survey questions are presented in **Appendix A**.

RETENTION EXPERIENCE AND EXPECTATIONS

As discussed in Chapter 1, WSDOT's ability to retain its existing workforce is crucial to its ability to fulfill its mission over the next several years, especially as the agency undertakes billions of dollars in new projects across the state. Since 2013, the agency has experienced increasing attrition (**Table 40**). This attrition includes normal retirements, voluntary resignations, terminations, deaths, and other reasons.

Of particular concern for the agency is the near doubling rate of voluntary attrition, or "quit rate," between 2013 and 2015. This has occurred at a time when local agencies are experiencing improving revenues and increased hiring. This increase has also occurred at the end of the mandated reduction in WSDOT employees (all employee reductions were to be made by June 30, 2015) and in a period of concern among employees about further layoffs. While data regarding the reasons for these resignations is limited, a continuation of this growth trend could be detrimental to the agency's ability to effectively fulfill its mission in the future. As WSDOT loses employees with experience—through retirement or resignations—replacing them with inexperienced workers creates an additional stress on the agency as these new employees are trained. This can be an especially difficult transition with employees resigning oftentimes being the very ones who would train new employees.

Turnover and Quit Rates

In 2015, WSDOT experienced the greatest attrition among employees in the benchmark classifications – 6.8 percent of these employees left the agency. While retirements drove turnover in 2013, with 62.5 percent of total turnover due to retirements, in 2014 and 2015, voluntary resignations – "quits" – overtook the number of retirements. [18]

Table 40: WSDOT Engineering and Technical Employees Attrition, 2013 - 2015

	2013	2014	2015
Total Separated Employees	**72**	**89**	**91**
Retirement	45	36	38
Terminated for Cause/Disciplinary	2	2	4
Deceased	1	2	1
Resigned	21	47	45
Other	3	2	3

Turnover Rate	**4.6%**	**6.3%**	**6.8%**
Quit Rate	**1.3%**	**3.3%**	**3.4%**
JOLTS State and Local Government Turnover Rate	**16.1%**	**16.4%**	**18.3%**
JOLTS State and Local Government Quit Rate	**7.5%**	**8.2%**	**9.0%**

Note: "Other" includes separations for reasons of disability; JOLTS data as of February 2016

According to the Bureau of Labor Statistics Job Openings and Labor Turnover Survey (JOLTS), WSDOT's total turnover and quit rates are well below similar rates for state and local governments nationally.[19]

Attrition by Tenure

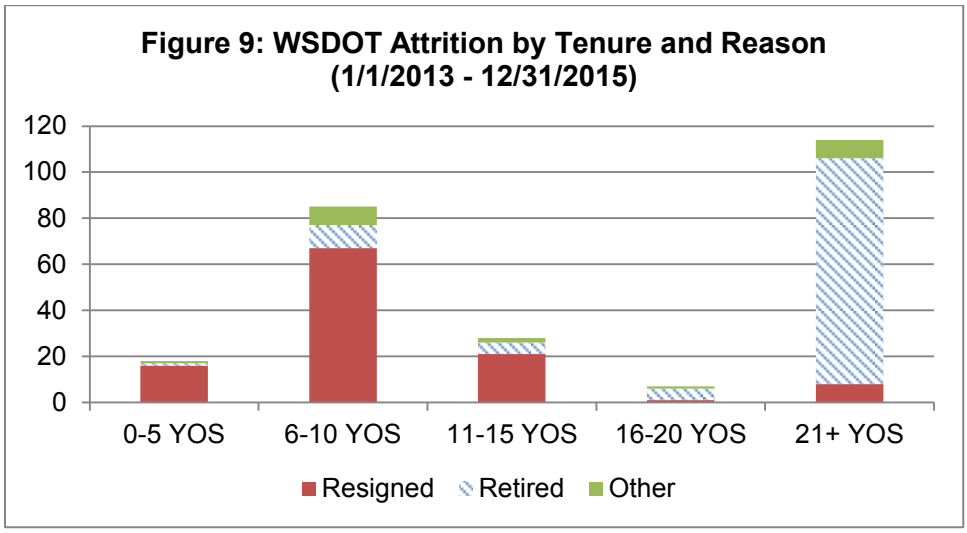
Figure 9 shows the breakdown of reasons for separation by years of service at the time of separation from January 1, 2013 through December 31, 2015. Among employees with 21 or more years of service, retirement is the primary reason for leaving the agency.

Also shown in **Figure 9**, resignations from the agency occur most commonly among employees with six to ten years of service, with 59.3 percent of total resignations occuring during this tenure bracket. Additionally, 92 percent of all resignations occur before 15 years of service. While this reflects only three years of attrition information, it is clear that the agency is struggling to keep

[18] The turnover rate is calculated by dividing the number of separated employees (including those who retired, were terminated for cause, died, or voluntary resigned) by the total number of employees at the beginning of each year The quit rate is calculated by dividing the total number of employees who voluntary resigned (including those who resigned for other state agencies) by the total number of employees at the beginning of the each year.

[19] JOLTS data is collected monthly by the BLS from private and public sector establishments across the United States. Data is collected on a voluntary basis, and the state and local data shown is not specific to any particular employee group. In addition, JOLTS data includes temporary and seasonal workers, who tend to experience higher turnover rates.

mid-career employees. Also, as reported by WSDOT managers, it is often the most highly-trained and competent employees who resign from the agency in early to mid-career.



Note: Retirements before 20 YOS can be attributed to employees who had previous State service outside of DOT or who retired early.

While the agency's data on the specific reasons for resignation is limited, among those 13 resigned employees who provided a reason, six (54 percent) cited better opportunities or career advancement as their reason for leaving. More detailed reasons for resignation will be explored later in this chapter.

Where Employees Are Going

The agency's data on where resigned employees went for their next employment opportunity is also limited; however, the available data does shed some light on new workplace trends.

Twenty-nine of the 113 WSDOT employees in the benchmark classifications who resigned between 2013 and 2015 provided information regarding their new workplace after leaving WSDOT employment. Nearly 40 percent of those employees went to local government within the State, while a little over 17 percent went to the private sector.

Table 41: New Workplace of Resigned Employees (Where Known)

	Count	Percentage
Local Government	11	37.9%
Private Sector	5	17.2%
Other WA State Agency	4	13.8%
Other Local Government Agency	3	10.3%
Other State Government	3	10.3%
Federal Government	2	6.9%
Public Sector/Non-Profit Entity	1	3.4%
Total	**29**	**100.0%**

The majority of respondents to PFM's survey also indicated that they are now employed by a local government, with 77.5 percent employed at some level of government.

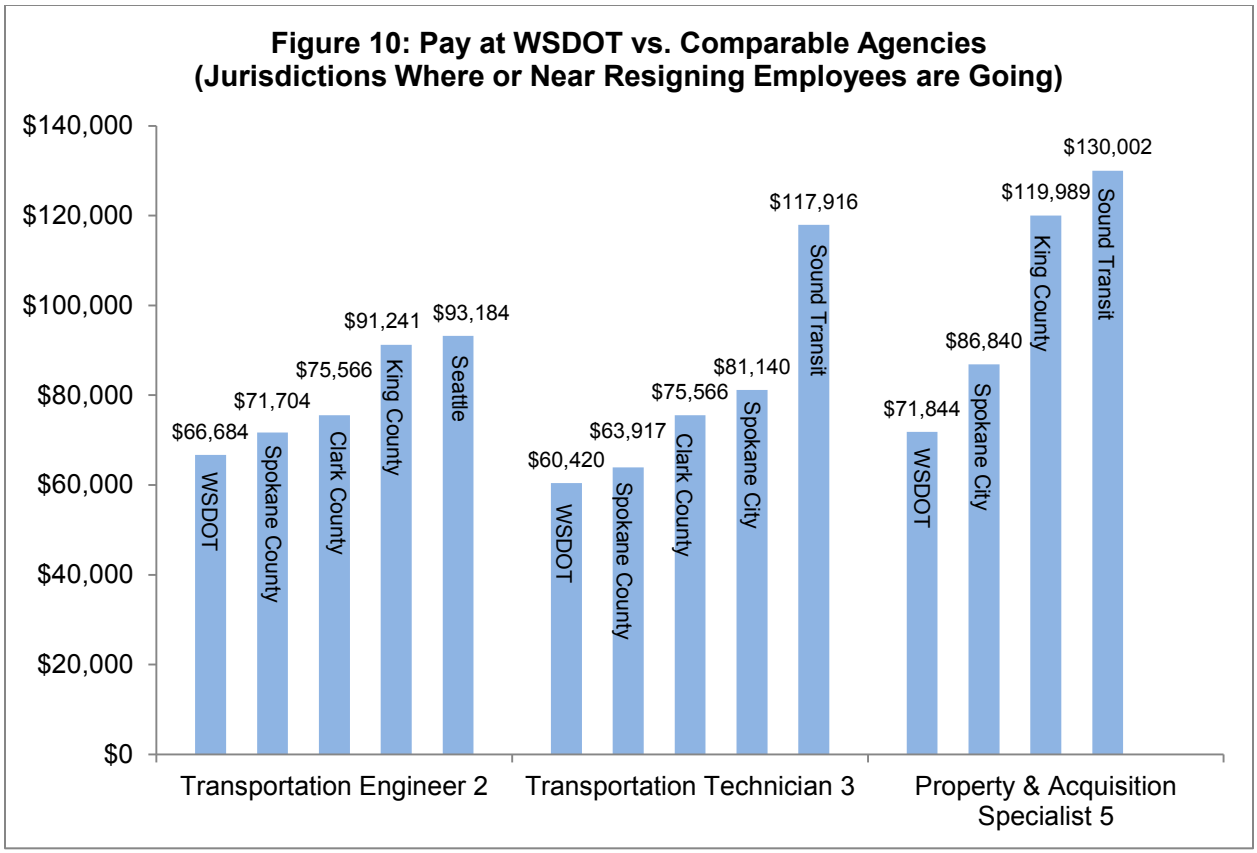
Table 42: WSDOT Separated Employees Current Employer

	Count	Percentage
Local Government	22	55.0%
State Government	7	17.5%
Federal Government	2	5.0%
Private Sector	6	15.0%
Non-Governmental Organization	0	0.0%
Unemployed	1	2.5%
Self-Employed	2	5.0%
Total	**40**	**100.0%**

Separated WSDOT employees went to the following local government employers:

- City of Seattle (3)
- Sound Transit (2)
- City of Spokane Valley (1)
- Port of Tacoma (1)
- City of Tukwila (1)
- City of Federal Way (1)
- City of Pasco (1)
- City of Lynwood (1)
- City of Oak Harbor (1)
- Snohomish County (1)
- Clark County (1)

WSDOT employees have left WSDOT for jurisdictions in the benchmark comparison group and jurisdictions in the same WSDOT regions as these comparators. **Figure 10** shows comparative base compensation, again at maximum base + longevity, for three classifications with the most current employees. Base compensation in these comparison agencies is significantly higher than WSDOT. WSDOT pay disparities range from 2.1 percent for the Transportation Engineer 2 in Seattle to 31.2 percent for the Transportation Technician 3 at Sound Transit.



DRIVERS OF ATTRITION

External Factors

As discussed in **Chapter 1**, it is difficult to project the expected hiring of other local agencies and private sector employers. According to the Bureau of Labor Statistics Employment Projections (EP) program, employment in the local government sector is expected to grow by approximately 4.3 percent between 2014 and 2024, with 5.6 percent growth among civil engineers within local government. Similarly, employment in the engineering services sector is expected to grow by 10.7 percent over the same period, with slightly higher growth for civil engineers (11.7 percent).[20] These figures can be taken as an indication of strong hiring among WSDOT's competitors.

Internal Factors

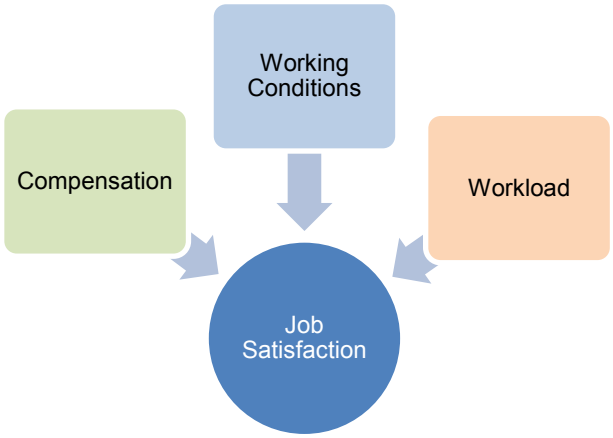
Availability of opportunities elsewhere does not alone motivate an employee to leave their current position. Based on survey results, separated WSDOT employees identified two main components of their job dissatisfaction – better pay and benefits and not feeling valued by the Department—this also showed up as lack of promotional opportunities and dissatisfaction with

[20] Bureau of Labor Statistics, Employment Projection (EP) Program, National Employment Matrix – Industry, 2014-2024 (most recent data available)

WSDOT processes. Other factors included a lack of certainty about the future of the agency and desire to work on wider array of projects.

As mentioned in Chapter 2, the wide pay disparity between WSDOT and comparative agencies places a greater emphasis on non-pay related benefits in retaining employees. As shown in the graphic below, job satisfaction is a combination of pay, working conditions and workload. The next sections of this chapter will focus on the non-compensation satisfaction determinants.

Factors Affecting Job Satisfaction



EMPLOYEE SATISFACTION

Compensation, working conditions, and lack of promotional opportunities all came up as reasons for employee dissatisfaction during focus group interviews and in the separated employees' survey results.

Employee satisfaction has practical implications relative to turnover and pay levels. Some analysts have posited, for example, that: "*As a general rule of thumb, persons who are struggling to pay their bills will leave for less than a 5 percent increase in salary, unhappy employees will leave for 5 percent, and satisfied employees generally require a 20 percent increase before they consider resigning.*"[21] Given that WSDOT employees are anywhere from 8-31% below median pay for comparable titles in local jurisdictions – a highly-satisfied WSDOT workforce could still be generating the high rates of attrition currently experienced due to pay alone. With these pay disparities, any significant dissatisfaction will result in higher resignations.

[21] Leigh Branham, The 7 Hidden Reasons Employees Leave, (New York: AMACOM, 2005), p. 25

Satisfaction of Separated Employees

PFM administered a brief survey to WSDOT engineering and technical employees who resigned from the agency between 2013 and 2015.[22] When asked to rank their primary reasons for leaving WSDOT, these employees identified compensation as the driving issue with several other issues also showing up as important in their decision.

Table 43: Survey Results: "What were your primary reasons for leaving WSDOT?"

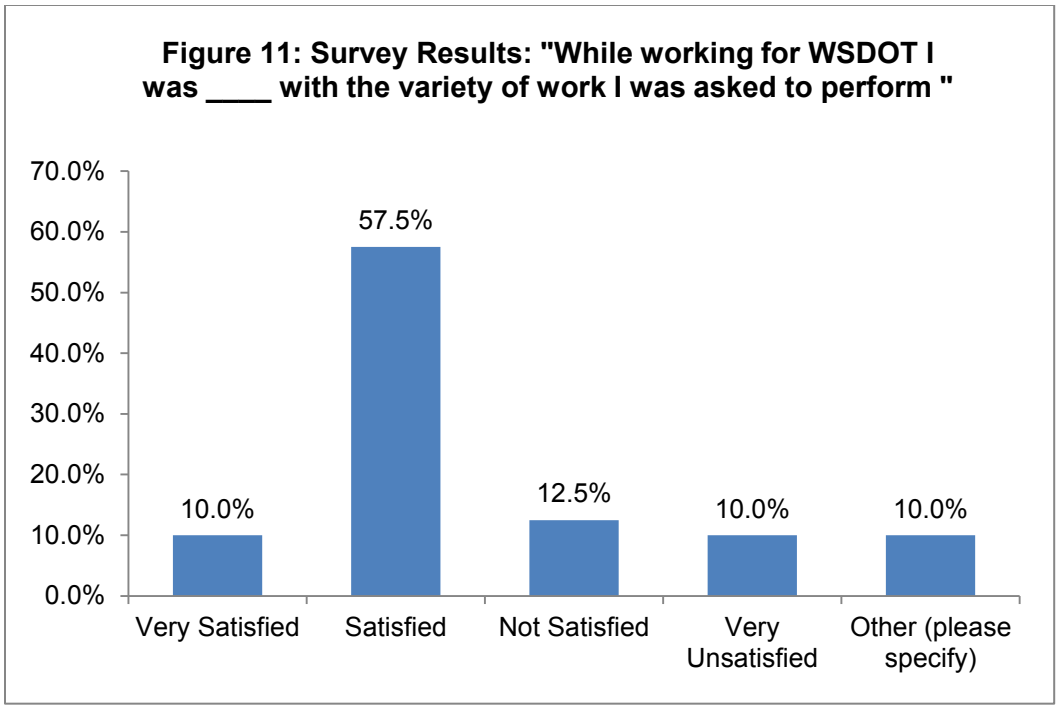
Reason for Leaving WSDOT	Important/Very Important[23]	Number of Employees
Better Pay	80.5%	33
Lack of Promotional Opportunities	78.0%	22
Not Feeling Valued by the Department	65.9%	27
WSDOT management	55.0%	22
Lack of certainty about the future of WSDOT	51.2%	21

Over 80 percent of former employees responding to the survey indicated that better pay elsewhere was an important or very important factor in their decision to leave WSDOT. Nearly 80 percent cited a lack of promotional opportunities at the agency as an important or very important reason to their decision to leave. Though not ranked as high in importance, not feeling valued by the department, department management, and a lack of certainty about the future of WSDOT were influential in respondents' decisions as well.

Working Conditions and Workload. Survey responses indicate that former WSDOT employees were satisfied with the variety of work they were asked to perform. As shown in **Figure 11** below, nearly 70 percent (27) of respondents indicated that they were satisfied or very satisfied with the variety of work.

[22] The survey was sent to 86 separated employees for whom email addresses could be determined. 40 individuals responded which yields a 47 percent response rate

[23] Percentage reflects percentage of respondents selecting "important" or "very important" for each reason. Not all respondents provided a response for each reason.



Note: Four (4) respondents selected "Other." These respondents provided specific comments about their satisfaction. Three of the four provided comments that indicated they were generally satisfied with the work variety.

However, during the project team's focus group discussions with several classification groups, some employees emphasized that they were concerned with how the variety of work may be impacted as the agency considered a change from a design-bid-build to a design-build process. This change will reduce the design-related work for WSDOT technical employees and could hamper retention efforts.

Under a design-bid-build process, the owner (in this case WSDOT) contracts with a designer and a contractor separately to design and build, respectively, the project under separate contracts. By contrast, under a design-build process, the owner contracts with a single entity to both design and build the project under a single contract. Design-build is considered more cost and time-efficient.

However with this potential change, WSDOT engineering employees indicated that much of their work will become contract management, rather than actual engineering work. Many engineers will only oversee the agency's consultants and will not perform the hands-on engineering work they were trained to perform. Anecdotally, focus group participants indicated that this is a major reason employees are leaving.

Participants also indicated that recent turnover, especially among more experienced employees, increases workloads for remaining employees. This is especially detrimental when experienced employees leave; they take with them the knowledge needed to effectively perform the required engineering work and oversight needed in the design-build process. Separated employee

survey comments indicate that they routinely work out of class and do the work of multiple employees. This overload can significantly increase job stress and affect employee morale.

COMPENSATION

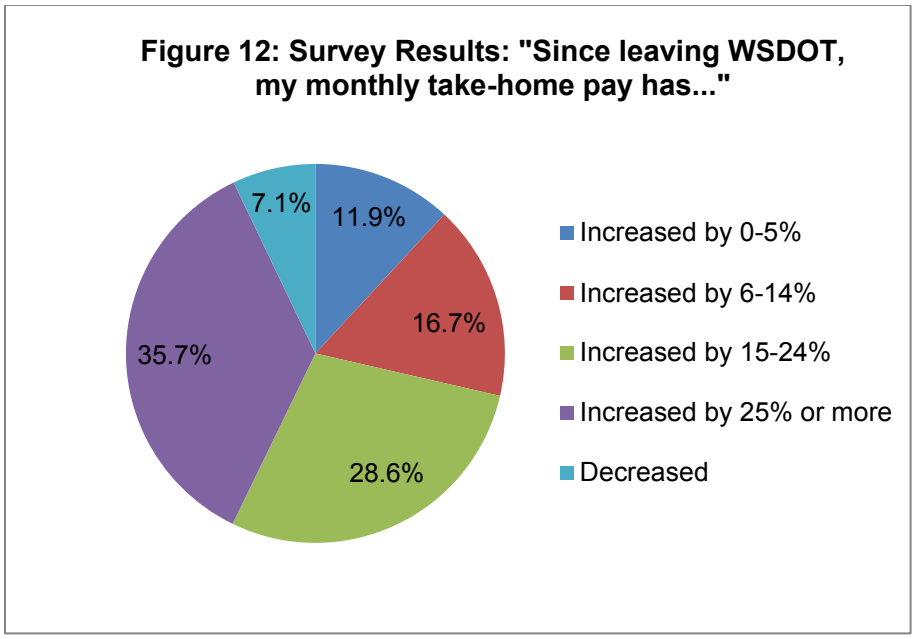
Over 80 percent (33 respondents) of former employees responding to the survey indicated that better pay elsewhere was an important or very important factor in their decision to leave WSDOT. This dissatisfaction with pay is also reflected in the 2015 exit survey results (conducted by State HR). Among all WSDOT employees (including those outside of the classification examined in this report), 82.1 percent indicated that compensation was their first or second reason for leaving.

As detailed in the first chapter of this report, the agency lags local employers in Washington State by significant margins. While there are some exceptions for certain classifications, WSDOT fairly consistently ranks at or near the bottom of the comparison group in terms of base compensation. Pay disparities are largest when comparing WSDOT to agencies in high cost-of-living areas like King County and Seattle. While WSDOT offers additional opportunities to earn other forms of cash compensation such as shift differential, holiday pay, overtime, and various assignment pays, these forms of compensation represent just 9.8 percent of base compensation, as shown in **Table 44**. Additionally, some comparable jurisdictions offer additional compensation opportunities as well.

Table 44: WSDOT Engineering and Technical Compensation by Type (CY2015)

Compensation	CY2015 Total	% of Base Pay
Base Pay	$92,144,522	-
Shift Differential	$50,119	0.1%
Holiday Pay	$3,958,977	4.3%
Overtime	$4,643,602	5.0%
Cell Phone and Commute Stipend/Incentive	$48,415	0.1%
Clothing Allowance	$380	0.0%
Call Back, Standby, and Schedule Change Pay	$89,980	0.1%
Assignment Pay	$252,579	0.3%
Total	$101,188,573	9.8%

In line with the variance between WSDOT and the compensation comparators, nearly 65 percent of separated employees responding to the survey indicated that their pay has increased by 15 percent or more since leaving WSDOT.



A number of employees participating in the focus groups indicated that geographic pay would go a long way to correcting some of the pay inequities with specific labor markets in the State. As shown in the previous chapter, WSDOT offers geographic assignment pay ranging from 2.5 percent to 10percent for a select number of classifications (Property & Acquisition Specialists 1-6 and Transportation Engineer 3s working as Cadastral Surveyors).

Lack of Promotional Opportunities. Opportunities to promote provide additional incentive to remain with an employer, earn additional compensation, and build one's skills. Seventy-eight percent of separated employees indicated that a lack of promotional opportunities was an important or very important factor in their decision to leave WSDOT. Similarly 79.6 percent of State exit survey respondents indicated that their first or second reason for leaving was related to non-monetary skill or career development. Representative comments regarding lack of promotional opportunity included:

- *"Lack of growth opportunities…it felt very dead-end: If you're happy with where you're at and have no desire to improve, great! If not, you won't be happy here for long."*
- *"Easy to get stuck in a role and unable to branch out."*
- *"Talented employees are limited in utilizing their skillset. There is no motivation to improve or advance."*

Based on both focus group and survey responses, it appears that the promotional system for engineering and technical classifications at WSDOT varies according to office, manager, and classification. Staffing levels dictate the number of employees who can be in progressively higher classifications in certain offices. This is especially true in smaller offices and regions where authorized staffing positions are lower. Transportation Engineers in particular made note that most Transportation Engineer 4 and 5 positions are assigned to the WSDOT headquarters,

meaning that in order to promote, employees would need to move or obtain their Professional Engineering license.

Transportation Technical Engineers (TTE) and Transportation Technicians participating in the project team's focus group indicated that a lack of promotional opportunity is especially evident in those classifications. Similarly for Transportation Technicians, employees can "top out" quickly when they reach the three level. While the employee could choose to enter the Transportation Engineer classifications, continued advancement might eventually require obtaining a professional engineering certification (though not all Transportation Engineer series positions require this licensure.

Additionally, survey and focus group responses indicated the process for promotion is not clearly stated. While promotion to some classifications was at one time automatic, the auto promotion procedure has since been discontinued. This change may be unclear to current employees. Focus group and survey group participants also indicated that in some offices, the promotional process is manager-specific, with some managers using a different promotional process than others. All of these factors create uncertainty about a long-term career at the agency.

FINDINGS AND RECOMMENDATIONS

Finding #7: Impact of Design-Build Contracting. Both current and former engineering employees report that because of a contemplated move from design-bid-build to design-build, engineers will become contract managers in charge of overseeing consultant engineers.

> ***Recommendation 7.1.*** As WSDOT moves into the 2017-2019 biennium, the agency should carefully consider how use of the design-build model will impact the current WSDOT engineering and technical workforce. While design-build is more cost and time-effective, current employee opinion of this process is negative overall, as it takes away employees' ability to do the engineering work they believe they were hired to do. Employee feedback on how best to use this process, and when, should be solicited. This can be addressed by having a portion of key projects designed by WSDOT engineering staff.

Finding #8: Broad Classification Specifications. While not reflected in survey or focus group responses, the project team found the current classification specifications for the benchmark classes to be very broad. Moreover, these classifications encompass a significant number of working titles. Focus group participants and WSDOT management both indicated that an employee in a class in one office might perform entirely different work than an employee in that same class in another office. Some working titles within a class might require additional specialized skills that are not recognized with a comparable adjustment in pay because the class is limited to a specific pay grade. This is the case for hydraulic and geotechnical engineers, but can also be present in other working titles as well.

> ***Recommendation 8.1.*** While the project team acknowledges that a major shift in the way the State classifies employees is not likely, it recommends a comprehensive review

of the engineering and technical class specifications. It would provide the opportunity to reevaluate if the duties and requirements of these specifications are in line with pay. Having broad classifications has the benefit of providing flexibility in the hiring process; therefore, alternative compensation options may need to be considered to address recruitment and retention concerns (e.g., expanded assignment pay or licensing pay).

Finding #9: As shown in Chapter 2, WSDOT compensation lags both public and private employers in various local labor markets across the state by significant margins. Additionally, many employees are at maximum base pay (reached after five and one-half years employment) and are thus wholly reliant on across-the-board increases or promotions to improve their compensation year-to-year.

Recommendation 9.1. Working with the Office of Financial Management, WSDOT should develop a long-term compensation strategy to address pay competitiveness within the State's ability to pay. Such a plan will help address current employee dissatisfaction with pay levels and improve the agency's ability to both recruit and retain valuable employees.

Recommendation 9.2. The State should strongly consider significant across-the-board pay increases for engineering and technical employees to remedy a portion of the current disparities with local government employers.

Finding #10: Geographic Pay. Geographic assignment pay is offered to a limited number of classifications and in varying amounts based on classification, as shown in **Table 45**.

Table 45: WSDOT Geographic Assignment Pays

	Regions	Pay Amount
Property & Acquisition Specialist 1	Northwest	2.5%
Property & Acquisition Specialist 2	Eastern Headquarters Northwest Olympic	5.0%
Property & Acquisition Specialist 3 Transportation Engineer 3 (Cadastral Surveyors)	PAS: Eastern Headquarters Northwest Olympic Transportation Engineers: Northwest Region and Urban Corridors Office	10.0%
Property & Acquisition Specialist 4-6	Eastern Headquarters Northwest Olympic	7.5%

Current WSDOT employees in the benchmark classifications suggested that expanding these pays to other titles would be effective in addressing WSDOT's low base pay in relation to higher cost-of-living regions (e.g. Northwest region) or regions where it is difficult to recruit employees (e.g. Eastern region).

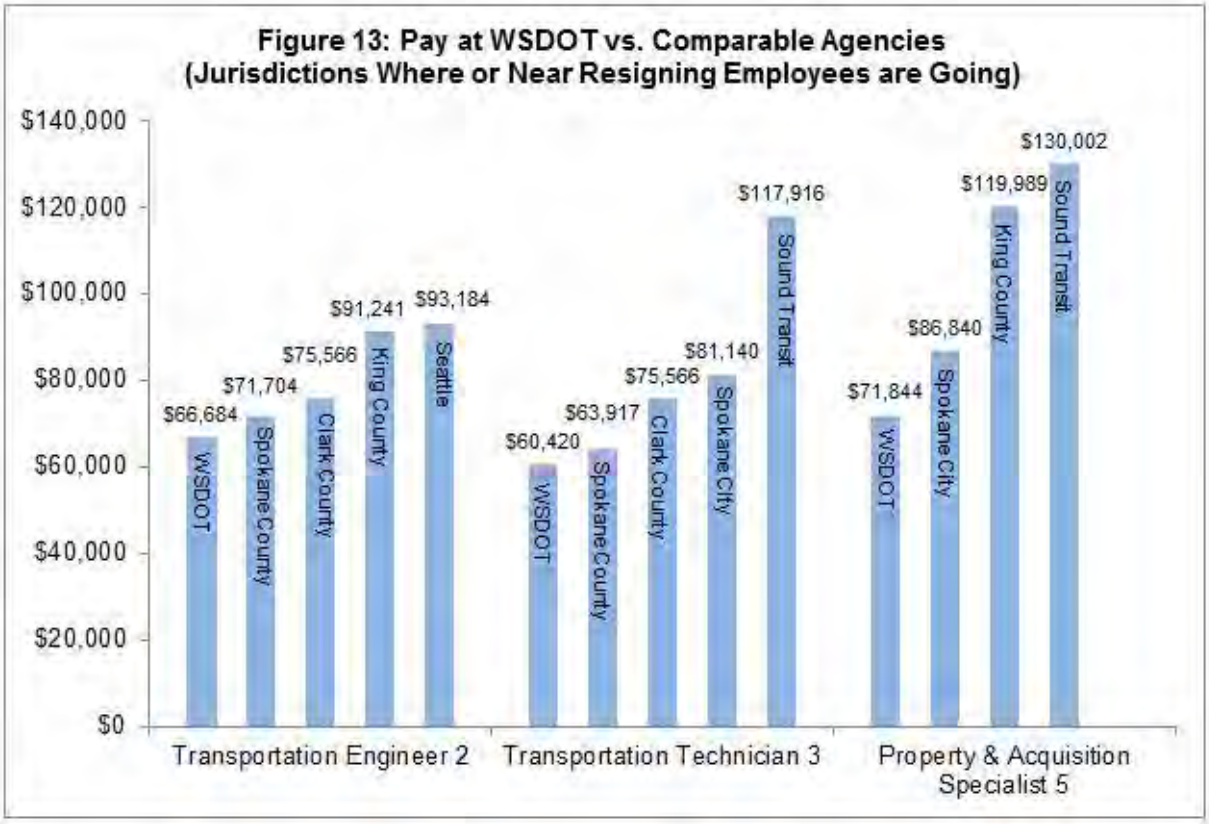


Figure 13 shows the pay differences between WSDOT and several local government comparators for three classifications. Pay differences are greatest in the heavily-populated, high cost-of-living Northwest region.

> ***Recommendation 10.1.*** Geographic assignment pay should be expanded to include all benchmark classifications. In addition, the agency should consider setting this pay not based on classification, but rather based on region. For example, employees in higher cost-of-living regions should receive higher geographic assignment pay.
>
> Any new structure for assignment pay, especially if it is expanded for recruitment and retention purposes, should be based on the market. **Table 46** shows WSDOT's variance from the median compensation at maximum base[24] in labor markets where the project team benchmarked local public sector employer compensation. Also included in this median calculation is private sector ERI data.[25] More detailed tables are available in **Appendix F**.

[24] Maximum base was used instead of maximum base + longevity as ERI data is only captured for maximum base pay.

[25] ERI data was included for Seattle and Mount Vernon in the Northwest Region, Tacoma and Olympia in the Olympia Region, Spokane in the Eastern Region, and Vancouver in the Southwest Region. ERI data was only available for the Transportation Engineer 2, Transportation Technician 3, and Property & Acquisition Specialist 3 classifications.

In order to implement geographic pay, WSDOT will need to be able to demonstrate difficulty in retention, hiring, or both in order to justify.

Table 46 shows that significant adjustments in geographic assignment pay will need to be made in most of these key regions to bring WSDOT compensation up to market levels. These changes should be made in tandem with across-the-board compensation increases.[26]

Table 46: WSDOT Variance from Median Pay in Select Regions

Region	WSDOT Variance from Regional Median for all Titles
Northwest	-33.2%
Olympic	-25.3%
Eastern	-4.9%
Southwest	-15.5%

Making geographic assignment pay applicable to all benchmark classifications, as well as basing pay on region rather than classification will not only help retain existing employees whose base pay is significantly below the market, but will also help to attract high quality candidates from areas where pay is more competitive, such as the Northwest region, or where hiring is difficult, such as the eastern side of the State. Adjustments to geographic assignment pay allow the agency to adjust pay without changes to the pay grades of each classification, which are set by State HR. Changes to geographic assignment pay must be made through the collective bargaining process/State HR.

Finding #11: Specialty Pays. WSDOT does not currently provide any additional pay for the possession of a Professional Engineer Licensure or other needed specialties/licensures. While many classifications do not require this licensure, many of the jobs done in the agency do, and advancement to Assistant Project Engineer and Project Engineer in the WMS requires a PE license.[27]

Recommendation 11.1. Another method for increasing take-home pay outside of across-the-board pay increases, while also encouraging professional development and training, would be to provide an annual educational allowance to support the attainment of a Professional Engineering (PE) license. While the allowance amount for the PE licensure should be determined by WSDOT and State HR, the allowance should be contingent upon the employee remaining at WSDOT for a period of years in order to ensure that employees do not leave the organization immediately upon obtaining the

[26] The average of the market for each region was determined by calculating the percentage difference between WSDOT compensation for each title at maximum and the median of compensation at maximum for all benchmark jurisdictions located in that particular WSDOT region. In addition to compensation at the benchmark jurisdictions, private sector ERI data was included in the median calculation for the Transportation Engineer 2, Transportation Technician 3, and Property & Acquisition Specialist 3 titles. Detailed tables showing all jurisdictions and ERI data included in the market median calculation can be found in **Appendix F**.

[27] Some Transportation Engineer 4 positions and all Transportation Engineer 5 positions require a PE license.

license. In addition to providing additional training, having a PE license will prepare more employees for promotion to TE4 and TE5 and to rise to the ranks of the WMS.

Subsidizing the attainment of a PE license would have the additional effect of improving the quality of engineering employees and making it possible for some current Transportation Technicians and Transportation Engineers 1-3 to move into or advance within the Transportation Engineer classifications, providing an incentive, and ability, to seek promotions to these classifications.

Finding #12: Promotion Process. The process for promotion at WSDOT varies by positon, manager, and office location. Uncertainty about the process and requirements for promotion creates uncertainty regarding a career path for employees in the benchmark classifications.

Recommendation 12.1. The agency should undertake a comprehensive review of the processes by which engineering and technical employees in all classifications are promoted to ensure that promotional processes are internally consistent and consistent with current staffing needs.

Finding #13: Employee Dissatisfaction. Feeling valued by the department, along with dissatisfaction with management, were key issues with separated employees. While some level of dissatisfaction lives in any organization, the low pay at WSDOT makes employee satisfaction with management a critical issue.

Recommendation 13.1. WSDOT should include in manager performance reviews a component for review by subordinates. This will allow upper management to understand where managers are doing well and where managers are in need of coaching to improve. Focusing on management performance is a critical issue as the agency works to retain qualified and trained employees. The agency has already begun efforts to improve management performance through individual performance plans and leadership training.

CONCLUSION

Improving the satisfaction of WSDOT engineering and technical employees is essential to halting the recent increase in voluntary resignations. To improve employee satisfaction, the agency will need to improve compensation, provide a clear path for career advancement, address management issues, and ensure that employees' skills are fully utilized as the legislature considers a transition to a design-build service model. As service needs grow over the next biennium, and with a wave of projected retirements coming in five years, WSDOT will need to address these issues quickly and systematically to ensure that it is able to effectively meet its short-term goals of the 2017-2019 biennium and, longer-term, its broader mission of providing sustainable, integrated multimodal transportation systems.

Improving compensation competitiveness is critical to recruiting and retaining high-quality engineering and technical employees. The agency should focus on development of a comprehensive, long-term compensation plan based on some of the recommendations in this

chapter. While implementation of such a strategy will inevitably result in some additional cost to the State, well-targeted compensation strategies will allow the agency to maximize return on the incremental dollars made available to it to address the market disparity.

Addressing other employee satisfaction issues such as discontent with management and work process is also critical. WSDOT management will need to be willing to address some difficult issues regarding the design-build process and what it means for the work of its employees.

A point of light in the survey responses is that 85 percent of respondents indicated that they would or would probably consider a return to WSDOT if their issues were addressed. This indicates that, if WSDOT takes the proper steps, it can vastly improve employee satisfaction and its ability to retain valuable employees. However, if no action is taken, the agency will likely see increasing vacancies and be unable to effectively fulfill its mission.

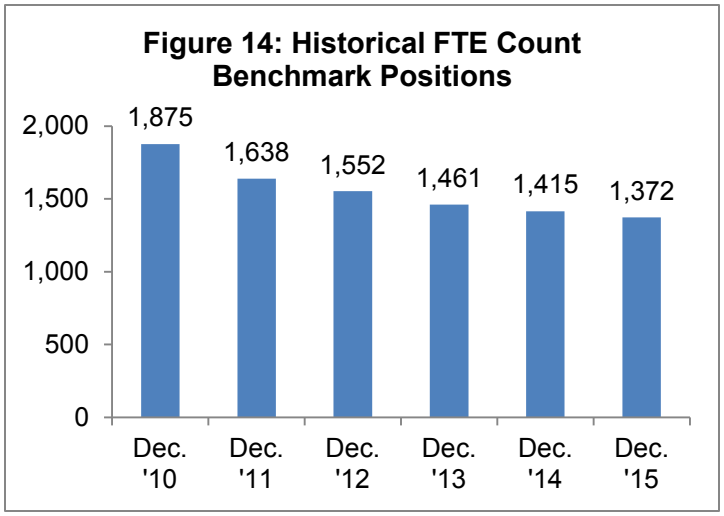
Chapter 4: Staffing Plan and Issues Affecting Recruitment of Engineering Employees

INTRODUCTION

As demonstrated earlier in this report, the recruitment process will be critical to the proper functioning of WSDOT as it begins to implement the State's $16.1 billion, 16-year construction program Connecting Washington. Over the last six years, WSDOT has been in the mode of position reduction as the project pipeline and reduced funding from the last recession limited the agency's funding. Reductions were made as much as possible through attrition, but often the engineers who left the agency were early in their career. As these positions became vacant, there was no need to re-fill, leading to a small workforce in the entry-level positions.

STAFFING PLAN

WSDOT has been through a great deal of change over the last five years. From undergoing an agency-wide reduction in allocated staff to the recent approval of a statewide $16.1 billion construction funding package, WSDOT is an agency in transition. As shown in **Figure 14**, WSDOT has seen a reduction of just over 500 benchmark positions between December 2010 and December 2015. This consistent reduction in benchmark classifications has had a significant impact on staffing distribution between classifications as well as ongoing recruitment activity.



Based on a review of workforce needs by engineering managers, the staffing needs should remain constant over the next several years, but may need to increase the core staff at higher than current levels. The agency plans to staff construction projects funded over the next several years. This section will lay out the current staffing plan for the next three years that will feed into the recruitment needs of the agency. Additionally, this section discusses issues that need to be resolved over the next three years in order to allow the agency to develop and implement a staffing plan that addresses its emerging needs.

Staffing Options

At this time, WSDOT is taking a position that additional hiring needed to fulfill the 16-year construction program will be met through a combination of contracting and existing WSDOT

staff levels. No additional position allocations (FTEs) are anticipated for the coming three years; however, it has also not been decided how to allocate the work between WSDOT staff and contractors. The matrix below outlines the options that are available.

Table 47: Staffing Options for Projected Work Volume

Option	Currently Used	Requires More WSDOT Staff	Positives	Negatives
Manage future projects in house	Yes	Yes	Creates variety of work for employees	Not easily adjusted if work is delayed or expedited
Contract out design and construction	Yes	No	Allows maximum flexibility with timing of projects	Re-focuses technical staff as contract managers. Could impact recruitment and retention (affects ability to grow experienced staff for PE/management positions)
Contract out more mundane tasks	Some	No	Allows WSDOT staff to take on more technical engineering work	Unclear if WSDOT has current workforce to provide all necessary services
Create a hybrid contract/WSDOT staff work program	Yes	Possibly	Can adjust ratio based on needs of agency and projects	Allows WSDOT to offer range of work tasks for talented employees

Currently, WSDOT management is pursuing options that will not increase, or only slightly increase, current allocated staffing levels. During delivery of recent construction programs, WSDOT delivered almost 50% of design dollars, with consultant effort and some design build. WSDOT has provided staffing in this manner for the past 10 years. This trend could continue, but will be dependent on being able to attract and retain a stable work force. Recently, WSDOT moved some preservation work to the maintenance program in an attempt to utilize a variety of delivery models and tools to adjust to the labor market and staff skills.

However, they have not yet determined how involved WSDOT engineers and technical staff will be in future project design and management. How they approach this will determine how they approach recruitment needs in the next several years, including:

- Increased attrition due to mid-career employees being unsatisfied with the work (this issue arose in both the survey as reasons people left and in focus groups as a concern for the future)
- Difficulty for recruiters in marketing engineering jobs at WSDOT as most of the engineering work is contracted out

Expected Staffing Needs 2017-2019

As shown in **Table 48** below, WSDOT will need to hire 450 employees in the engineer and technical classifications to first fill all vacant positions, and then to keep up with projected retirements and resignations through 2019. Beyond that, hiring needs will continue at a similar pace to keep up with expected attrition. This does not account for any additional hiring that might be needed if WSDOT takes on design and construction responsibilities for a portion of the programmed new projects.

Table 48: CY2016-2021 Hiring Needs (All Classifications)

	2016	2017	2018	2019	2020	2021
Cumulative	227	298	377	450	538	619
Year-by-Year	227	71	79	73	88	81

Issues to Address

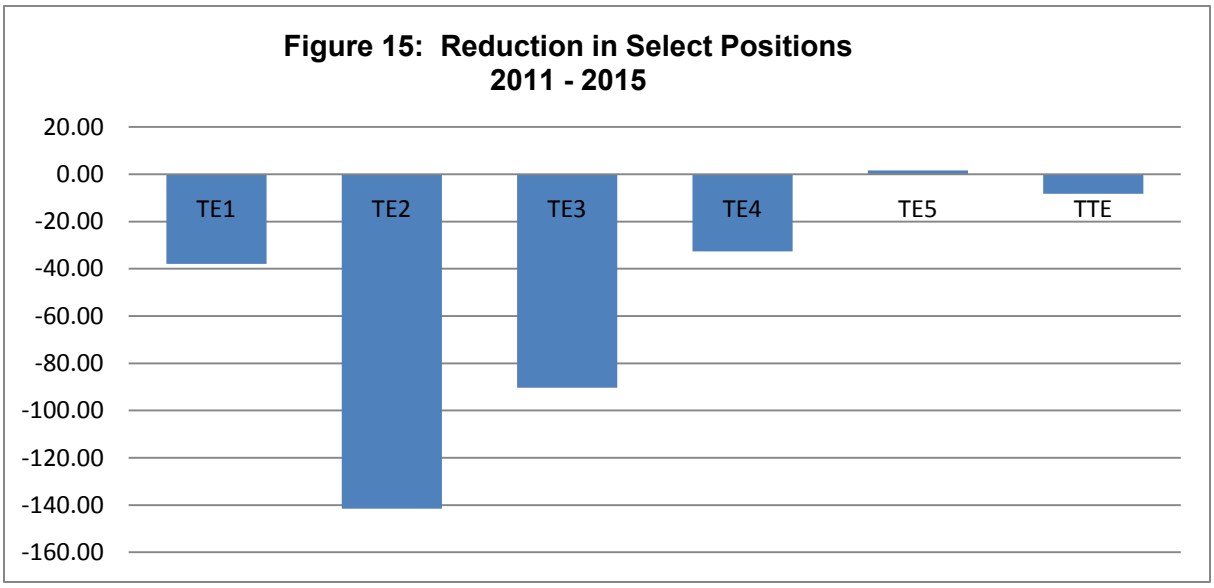
Contract vs. in-house design and construction. The agency should begin planning now for how it will apportion new work between in-house design and construction and outside contractors and consultants. This may be a multi-year strategy that changes over time, but such a strategy will send a clear message to the workforce about the direction management is headed.

Loss of lower-level employees. Since 2011, WSDOT has lost 270 Transportation Engineer 1, 2, and 3s while only losing 32 Transportation Engineer 4s and gaining 1.5 Transportation Engineer 5s. This reduction at the lower level classifications has several ramifications for future hiring:

1. **Training Needs.** Most hiring will be at the lower staffing levels resulting in a need for training, but the attrition will be at the higher staffing levels for both retirement and expected resignations. WSDOT needs to address this expected trainee-trainer gap.
2. **Targeted Skill Levels.** The employees hired in the next several years will provide the workforce to execute the WSDOT staffing plan. Is that plan to primarily contract out future work, do it in house, or a combination of those two? Setting a direction

prior to embarking on hiring new staff is important to hiring the right skill sets to execute that plan.

3. **Experience Level.** As longer-tenured staff retires, there may not be enough trained and experienced staff to fill the void that can be left by this attrition. Training new staff to be prepared to take over complex engineering tasks can take years. WSDOT may need to look to experienced personnel to hire into more senior positions. This may be difficult given the current pay structure, but it may also cause issues with lower-level employees who feel they are being passed over.



Source: WSDOT HR data

All of these issues point to a need for WSDOT management to develop a strategy to address the execution of the Connecting Washington transportation program along with all of the ongoing work of the agency. Developing this plan will lead to clear directions on hiring strategies and needs and will be invaluable to recruiters in developing their own strategy for addressing the agency's hiring needs.

RECRUITMENT OVERVIEW

Recruitment Process

The recruitment process at this time is very straightforward, as demonstrated in the graphic below. This is the same process followed for all position recruitments.

As discussed above in the Staffing Plan section, there is a need to broaden the recruitment process to be more strategic in order to meet long-term agency goals and needs. The recruitment process as it stands does not take a strategic approach to fulfilling its mandate for hiring. This is due to a combination of an absence of a hiring strategy, a holdover from a several-year reduction in staffing where many of the long-term recruitment programs were abandoned, and trying to accomplish the entire hiring process with an understaffed recruitment office.

Since 2013, the number of benchmark positions for which WSDOT has hired has grown from 58 in 2013 to 194 in 2014 and 148 in 2015, as shown in **Table 49.** Most of this hiring was for Transportation Engineers, followed by Transportation Technicians. This number of positions is in line with expected needs over the next several years; therefore, it is in the processing capacity of the recruitment office. However, this assumes an ongoing passive recruitment process that relies on picking from applicants that see the ad and choose to apply. Overall recruitment will be more fruitful—better fit employees with longer tenure—if they can be understood and targeted in advance of job announcements.

Table 49: Positions Hired bv Year

Position	2013	2014	2015	Total
Transportation Engineer				
TE1	3	24	25	52
TE2	10	83	33	126
TE3	29	33	31	93
TE4	3	7	6	16
TE5	0	1	1	2
Total	**45**	**148**	**96**	**289**
Transportation Technical Engineers				
TTE	2	1	4	7
Total	**2**	**1**	**4**	**7**
Transportation Technicians				
TT2	4	21	17	42
TT3	3	12	13	28
Total	**7**	**33**	**30**	**70**
Property Acquisition Specialist				
PAS2	0	0	4	4
PAS3	2	5	5	12
PAS4	0	2	1	3
PAS5	2	2	1	5
PAS6	0	1	0	1
Total	**4**	**10**	**11**	**25**
Miscellaneous				
Intern	0	0	6	6
Other	0	2	1	3
Total	**0**	**2**	**7**	**9**
Total	**58**	**194**	**148**	**400**

Process Timing

Data from the past three years of recruitments shows a consistent average number of days from posting of a job to making a job offer for the position. On a consistent basis, the days to hire have been under two months for most positions in most years. This shows a level of efficiency in the hiring process that should be helpful in the overall recruitment process.

Table 50: Average Days to Hire by Year

Position	2013	2014	2015	Average
Transportation Engineer				
TE1	64.3	50.9	52.7	52.5
TE2	45.0	54.1	48.1	51.8
TE3	44.0	42.6	43.6	43.4
TE4	38.0	46.3	119.7	72.3
TE5	-	36.0	72.0	54.0
Average	**45.2**	**50.5**	**52.6**	**50.4**
Transportation Technical Engineers				
TTE	26.5	42.0	52.8	43.7
Average	**26.5**	**42.0**	**52.8**	**43.7**
Transportation Technicians				
TT2	39.0	61.3	90.2	70.9
TT3	42.3	50.6	50.7	49.8
Average	**40.4**	**57.4**	**73.1**	**62.4**
Property Acquisition Specialist				
PAS2	-	-	55.5	55.5
PAS3	71.0	45.0	52.0	52.3
PAS4	-	21.5	44.0	29.0
PAS5	44.0	56.0	96.0	59.2
PAS6	-	31.0	-	31.0
Average	**57.5**	**41.1**	**56.5**	**50.5**
Miscellaneous				
Intern	-	-	-	129.0
Other	-	55.0	38.0	49.3
Average	**0.0**	**55.0**	**124.1**	**123.1**

Budget for Recruitment

As staff and projects were being cut from the WSDOT budget over the last several years, one of the first items to go was the recruitment budget. As it stands, the budget for recruitment covers the recruitment staff, basic marketing materials, and general office needs. As shown in the graphic above, the recruitment process is primarily driven by department managers receiving authorization to post a position and the recruiting office supporting that hire through posting the job announcement on several job websites. This reflects the lack of budget for hiring, as well as the lack of importance the recruitment process has been given, and rightfully so, over the last several years.

Staffing

The recruitment office has six recruiters housed in different WSDOT districts in the State. The recruiters are responsible for guiding the hiring process and work closely with managers to provide the best fit for the job being sought. At the writing of this report, the recruitment office is down three recruiters, but is planning on hiring two in the next month and a third by the end of the year. This type of turnover makes it difficult to maintain a consistent recruitment program. The hiring of a manager for "Talent Acquisitions" earlier this year is helping to provide a focus for future recruitment efforts.

Recruitment Systems

Currently WSDOT uses NEOGOV to accept and track applications. Recruiters noted that this system is antiquated and makes for a less-than-ideal candidate experience and a less efficient recruitment process. The NEOGOV system does not provide a search function to allow for examination of key metrics regarding applicants – demographic characteristics, years of experience, etc. Recruiters cannot search past applicants who weren't selected in one recruitment, for sourcing for other positions; these applicants might be better fits for new positions, but staff is unable to easily locate and reach out to them when a new position comes open.

If a position is not filled, recruiters have to repost the position and an applicant has to repeat the entire application process over again; this includes uploading their cover letter, submitting personal information, and answering qualifying questions. In total, recruiters report that this causes frustration for both recruitment staff and applicants and has the potential to turn off some highly-qualified applicants from WSDOT.

OUTREACH AND MARKETING

The current process used by WSDOT is more of a hiring process than a recruitment process. Recruiters post a job identified as needed and then hope that they get the right applicant(s) to fill the job. An element missing from the process is the early identification of need and the targeted recruitment of potential applicants long before the job is available. This is especially applicable with difficult-to-fill positions such as hydrologist.

Typically, advertising for the engineering positions are posted on one or more of the following websites:

- monster.com
- careerbuilder.com
- ACE
- SWE (Society of Women Engineers)
- engineering.com
- indeed.com
- State of Washington website

- LinkedIn.com
- Facebook.com
- twitter.com
- other specific engineering sites

For difficult to fill positions WSDOT recruiters would prefer to conduct direct sourcing techniques—such as outreach to qualified potential personnel not actively in the job market, but due to limited resources they do not currently have the capability to actively source passive candidates at this time. Other marketing techniques used in the past that should be reconsidered include:

- Recruiter relationships with civil engineering departments at colleges and universities. These relationships can lead to identifying an intern pool as well as entry-level employees just out of college. WSDOT actively recruited in colleges and universities before the recent recession, but did not maintain these relationships during the reduction in force that occurred between 2009 and 2013.
- Employee referral programs are often used to identify potential applicants who may be well-suited for work in WSDOT and already have a connection in the agency. Leveraging existing employees to identify future employees expands the reach of the recruiters and adds a personal appeal to the marketing pitch for WSDOT employment.

TRAINING/MENTORING PROGRAMS

WSDOT reestablished an intern program in 2015. The program, which is reported to have been robust in the past, was abandoned during the period of FTE reductions. This program allows current college students an opportunity to work in WSDOT prior to graduating college. If they decide to join WSDOT after graduation, they come with some training and understanding of the agency. Additionally, intern programs allow managers to get to know a potential employee prior to full-time employment. This program also provides an opportunity to market the WSDOT to colleges and universities from where interns are likely to come.

A related program is a mentoring program. These programs allow new, or recent, hires an opportunity to rotate through several divisions and assignments throughout the agency to help build a well-rounded employee and an employee that understands the different components of the agency. This type of program would also allow newer employees to develop a relationship with a senior level mentor to help guide them during the course of their career at WSDOT. The ability to maintain these types of programs is dependent on the ability of the employee to complete discrete work within the time of the rotation—typically six to nine months. If the work load is unbalanced and the ability to provide training is limited, a mentoring program can be difficult to maintain. If they can be maintained they offer an invaluable opportunity to train future leaders within the agency.

FINDINGS AND RECOMMENDATIONS

Finding #14: Staffing Plan. The staffing plan through 2019 is to maintain current levels of FTE allocations. Management is in the process of determining how to staff future projects, and is likely to utilize some mixture of WSDOT staff and consultants; however, that mix is not yet determined.

> ***Recommendation 14.1.*** WSDOT management needs to develop a plan for how they are going to staff projects to be constructed under the new construction funding bill. Once a plan is in place, WSDOT can develop an implementation strategy that will help guide training and recruitment programs.
>
> ***Recommendation 14.2.*** There should be regular and scheduled meetings between top WSDOT staff and recruitment staff to help identify staffing needs as early as possible. This provides the opportunity to be more proactive in the hiring process, identifying and marketing to potential applicants ahead of actual job openings. This cannot be done without a detailed staffing plan and direction for future hiring needs.

Finding #15: Recruitment Plan. An ongoing dialogue between WSDOT managers and the recruiting office has not been established. Currently, the recruitment office works on a reactive rather than proactive basis, as they don't know future recruitment needs. WSDOT HR is working on establishing these connections and developing a detailed hiring plan for the engineering/technical positions.

> ***Recommendation 15.1.*** WSDOT HR and other senior management should create a proactive recruitment plan in tandem with identification of staffing needs and a formal staffing plan. This recruitment plan should be revisited periodically to ensure that recruitment efforts are effective and meeting staffing needs.
>
> ***Recommendation 15.2.*** WSDOT HR should evaluate its use of NEOGOV to ensure use of full functionality of the system to recruit, track, and provide statistics on applicants. WSDOT should work with the Department of Enterprise Services and Washington Technology Solutions to determine if enhancements can be made to NEOGOV to provide search methods effective for sourcing candidates.
>
> ***Recommendation 15.3.*** WSDOT HR should consider developing a method to track candidates from previous recruitment and outreach efforts to allow for efficient sourcing of candidates for future vacancies. This would maximize sourcing efforts and provide an additional resource for recruiters and HR professionals to quickly identify potential candidates.

Finding #16: Training. There is a need for training of new employees that will be difficult to meet. The reduction in allocated positions over the last several years affected lower-tenured employees the most. WSDOT has fewer trained lower-level employees and a looming retirement bubble that will further drain experienced engineers out of the workforce.

Recommendation 16.1. Using existing vacant FTE positions to bring on new hires as early as possible for training from more experienced staff that is likely to be leaving the agency. This allows the agency to train new hires in an unrushed fashion.

Recommendation 16.2. As training needs intensify with increased new hires and decreased staff at the higher levels, WSDOT should recruit qualified retirees who can help provide training on an ad hoc basis as retired annuitants. This will allow training to occur on a focused basis by someone who understands the job but is not burdened by other project or administrative duties.

Finding #17: Proactive Recruitment. The current recruitment process is reactive to immediate needs identified by managers and approved for hiring. The technical nature of many of the WSDOT jobs requires the early identification of potential applicants with training and interest in civil engineering, transportation engineering, and related fields. A portion of each recruiter's time should be spent being proactive in developing relationships for future hiring needs.

Recommendation 17.1. WSDOT recruiters should reestablish ties with college engineering programs throughout the State and in nearby states.

Recommendation 17.2. WSDOT should seek to build a robust internship program with the goal of this program feeding into entry-level engineering positions. This will provide the backfill needed for upper-level positions as retirements increase in the coming years.

Finding #18: Specialized Hiring. The WSDOT has had difficulty identifying and hiring specialized technical positions that are critical to the mission of the agency, such as hydrologists, geotechnical, and traffic engineers. This difficulty is largely due to the low pay associated with these positions in the broader job classifications utilized by WSDOT.

Recommendation 18.1. Provide compensation incentives for most difficult to hire positions, such as hydrologist or other specialized positions, that have far lower compensation than comparative agencies. In areas where the WSDOT is already significantly below market, it may be most cost effective for the agency to target specialty pay for critical positions that are difficult to hire. This is highlighted by the fact that the broad job classifications used by WSDOT most likely lead to disparities in comparative pay that do not show up in pay comparisons.

Conclusion

WSDOT performs critical work throughout the State in providing safe and efficient transportation systems. These systems are designed, built, and maintained by the nearly 7,000 employees that work for WSDOT. A critical component of that workforce are the over 1,300 engineers and technical employees that perform or oversee the majority of technical duties required to carry out this mission.

As WSDOT moves from a mode of reducing staff and doing their best to maintain existing systems, to managing a $16 billion construction program over the next decade and a half, the engineer and technical jobs will become vital to carrying this out. WSDOT has moved from a forced reduction of 800 staff throughout the agency to a need to maintain current staffing allocations with quality employees. At the same time, the agency is responsible for implementing a $16 billion construction program through a combination of in-house and contract work.

As WSDOT moves forward in implementing the construction projects, they must decide how they plan to staff this work. Those decisions will drive issues related to who the agency needs to hire over the next three years and how the agency wants to position itself in the labor market for many years to come.

Under any circumstance, three changes are needed. Ideally, these changes would be made simultaneously:

1. **Compensation for engineering and technical workers is significantly under market on most classifications. This disparity *must* be addressed in the near future**. This can be done through a combination of across-the-board increases to base salary, targeted specialty pay for difficult-to-hire positions, geographic pay, or a combination of these types of compensation increases.

2. **Management needs to develop a service-delivery plan for the recently-approved construction program** to determine how much of the upcoming design and construction management work will be done in-house and how much will be contracted out. This will drive hiring needs not so much in how many to hire, but more what skillset to hire

3. **Recruitment processes need to utilize more proactive methods to find and attract qualified candidates for essential engineering and technical positions**. This could include re-establishing relationships with engineering departments in colleges and universities statewide and expanding the recently-revived internship program to provide necessary backfill for more senior employees who might depart the agency in coming years. These methods are likely to work better for entry-level employees. Experienced engineers are unlikely to come to WSDOT without adjustments in compensation first.

Appendices

Appendix A: PFM Survey Administered to Former WSDOT Employees in Benchmark Classes

1. How many years did you serve as a WSDOT Employee?
   - 0-5
   - 6-10
   - 11-15
   - 15+

2. Please select your current employer
   - Local Government
   - State Government
   - Federal Government
   - Non-governmental organization
   - Unemployed
   - Self-Employed
   - Private Sector

3. What were your primary reasons for leaving WSDOT? [Please rate the importance of each factor below]
   - Relocation out of state
   - State work not conducive to family life
   - Lack of promotional opportunities at WSDOT
   - Wanted out of government sector work
   - Better benefits
   - Not feeling valued by the Department
   - Lack of certainty about the future of WSDOT
   - Not feeling respected by coworkers
   - Wanted to work on a wider array of projects
   - Personal issue
   - Better pay
   - WSDOT management
   - Lack of sufficient training at WSDOT
   - Other (please specify)

4. Since leaving WSDOT, my monthly take-home pay has:

- Increased by 0-5%
- Increased by 6-14%
- Increased by 15-24%
- Increased by 25% or more
- Decreased

5. While working for WSDOT I was ____ with the variety of work I was asked to perform (Please fill in the blank with the word that best fits)

- Very Satisfied
- Satisfied
- Not Satisfied
- Very Unsatisfied
- Other (please specify)

6. While working for WSDOT I was ____ with the opportunities for promotion (Please fill in the blank with the word that best fits)

- Very Satisfied
- Satisfied
- Not Satisfied
- Very Unsatisfied
- Other (please specify)

7. Since leaving WSDOT, I am:

- Happier
- Less Happy
- No Change

8. Since leaving WSDOT my benefits are:

- Better
- No Different
- Worse

9. What I miss most about WSDOT is (Please rank using 1 as what you miss the most and 5 as what you miss the least):

- Government service
- Ability to control my workload
- Employment benefits of the WSDOT
- Co-Workers
- Salary
- Flexible Work Hours
- Other (please specify)

10. What I like most about my new job is (Check all that apply):
- Type of work
- Management structure
- Ability to do a variety of exciting projects
- Increased pay
- Improved benefits
- Ability to promote
- Other (please specify)

11. I encourage people to consider WSDOT as a career:
- Yes
- No
- Other (please specify)

12. If you answered "No" to question 11, please describe why you would not encourage people to consider WSDOT as a career:

13. Would you consider returning to WSDOT if your reasons for leaving were resolved?
- Yes
- No
- Maybe

14. (Optional) I would be willing to talk to someone from the PFM consulting team in confidence about my experience as a WSDOT employee (please list your name and contact information):

15. Please enter how many years of work experience you had when you joined WSDOT:
- Less than 1
- 1-5
- 6-10
- 11-15
- 16-20
- 20-25
- 25+

16. Please enter how many years of work experience you had when you left WSDOT:
    - Less than 1
    - 1-5
    - 6-10
    - 11-15
    - 16-20
    - 20-25
    - 25+

17. Please select your gender:
    - Male
    - Female
    - Other

18. Which race/ethnicity best describes you? (Please choose only one)
    - American Indian or Alaskan Native
    - Asian / Pacific Islander
    - Black or African American
    - Hispanic
    - White Caucasian
    - Multiple ethnicity / Other (please specify)

19. What was your highest level of educational attainment while working for WSDOT:
    - Graduated from high school
    - 1 year of college
    - 2 years of college
    - 3 years of college
    - Graduated from college
    - Some graduate school
    - Completed graduate school

20. Please provide your current job title: [open answer]

21. Please provide your last job title while working for WSDOT: [open answer]

Appendix B: Detailed Vacancy Projection

Ten-Year Projection – All Engineering and Technical Titles

All Engineering and Technical Titles	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Authorized Positions	**1372**	**1372**	**1372**	**1372**	**1372**	**1372**	**1372**	**1372**	**1372**	**1372**	**1372**
Workforce at start of year	1257	1144	1073	994	921	833	752	649	540	422	313
Less Attrition											
Retirements	(65)	(23)	(31)	(25)	(40)	(33)	(55)	(61)	(70)	(61)	(57)
Non-voluntary	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Resignations (2015)	(45)	(45)	(45)	(45)	(45)	(45)	(45)	(45)	(45)	(45)	(45)
Workforce at end of year	**1145**	**1074**	**995**	**922**	**834**	**753**	**650**	**541**	**423**	**314**	**209**
Vacancy Rate	*(16.5%)*	*(21.7%)*	*(27.5%)*	*(32.8%)*	*(39.2%)*	*(45.1%)*	*(52.6%)*	*(60.6%)*	*(69.2%)*	*(77.1%)*	*(84.8%)*
Cumulative Hiring Needs	**227**	**298**	**377**	**450**	**538**	**619**	**722**	**831**	**949**	**1058**	**1163**
Year-by-Year Hiring Needs	**227**	**71**	**79**	**73**	**88**	**81**	**103**	**109**	**118**	**109**	**105**

Ten-Year Projection – Transportation Engineer Classifications and Transportation Technical Engineers

Transportation Engineers and Transportation Technical Engineers	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Authorized Positions	**947**	**947**	**947**	**947**	**947**	**947**	**947**	**947**	**947**	**947**	**947**
Workforce at start of year	940	855	800	740	690	622	563	480	395	303	213
Less Attrition											
Retirements	(48)	(18)	(23)	(13)	(31)	(22)	(46)	(48)	(55)	(53)	(45)
Non-voluntary	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Resignations (2015)	(36)	(36)	(36)	(36)	(36)	(36)	(36)	(36)	(36)	(36)	(36)
Workforce at end of year	**855**	**800**	**740**	**690**	**622**	**563**	**480**	**395**	**303**	**213**	**131**
Vacancy Rate	*(9.7%)*	*(15.5%)*	*(21.9%)*	*(27.1%)*	*(34.3%)*	*(40.5%)*	*(49.3%)*	*(58.3%)*	*(68.0%)*	*(77.5%)*	*(86.2%)*
Cumulative Hiring Needs	**92**	**147**	**207**	**257**	**325**	**384**	**467**	**552**	**644**	**734**	**816**
Year-by-Year Hiring Needs	**92**	**55**	**60**	**50**	**68**	**59**	**83**	**85**	**92**	**90**	**82**

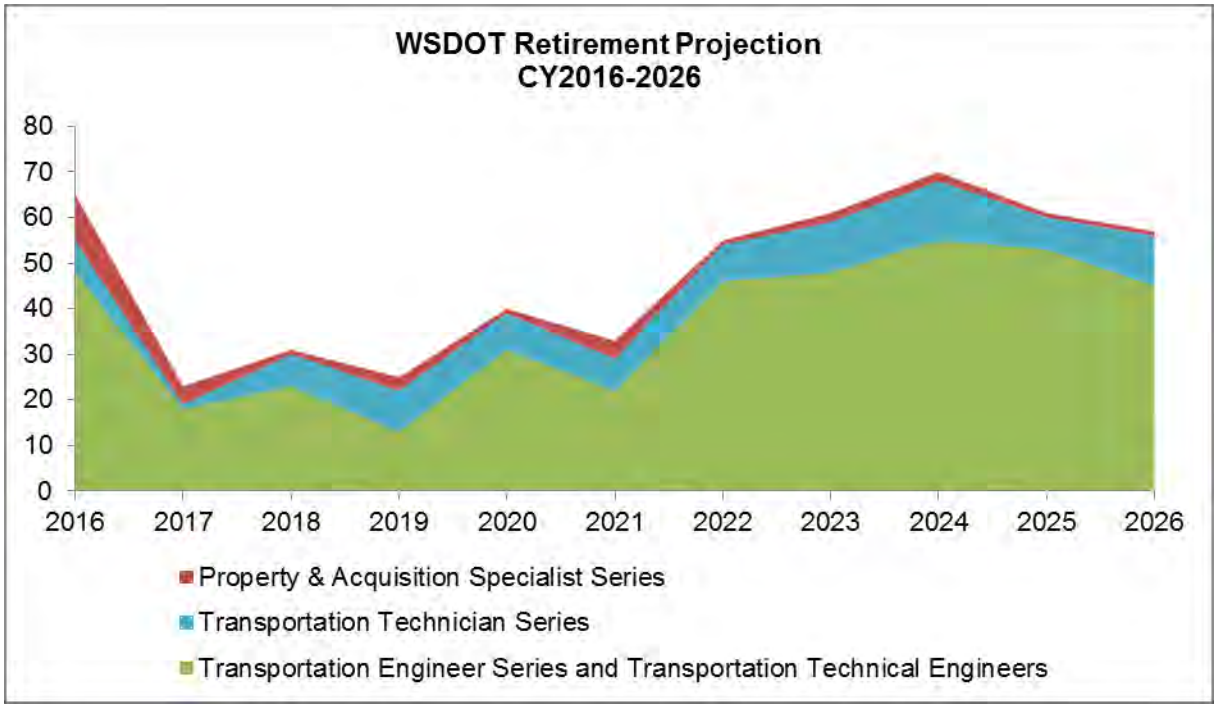
Ten-Year Projection – Transportation Technician Classifications

Property & Acquisition Specialists	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Authorized Positions	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**
Workforce at start of year	64	49	40	34	26	20	11	5	(2)	(9)	(15)
Less Attrition											
Retirements	(10)	(4)	(1)	(3)	(1)	(4)	(1)	(2)	(2)	(1)	(1)
Non-voluntary	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Resignations (2015)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)
Workforce at end of year	**49**	**40**	**34**	**26**	**20**	**11**	**5**	**(2)**	**(9)**	**(15)**	**(21)**
Vacancy Rate	*(30.0%)*	*(42.9%)*	*(51.4%)*	*(62.9%)*	*(71.4%)*	*(84.3%)*	*(92.9%)*	*(102.9%)*	*(112.9%)*	*(121.4%)*	*(130.0%)*
Cumulative Hiring Needs	**21**	**30**	**36**	**44**	**50**	**59**	**65**	**72**	**79**	**85**	**91**
Year-by-Year Hiring Needs	**21**	**9**	**6**	**8**	**6**	**9**	**6**	**7**	**7**	**6**	**6**

Ten-Year Projection – Property & Acquisition Specialist Classifications

Transportation Technicians	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Authorized Positions	**285**	**285**	**285**	**285**	**285**	**285**	**285**	**285**	**285**	**285**	**285**
Workforce at start of year	253	240	233	220	205	191	178	164	147	128	115
Less Attrition											
Retirements	(7)	(1)	(7)	(9)	(8)	(7)	(8)	(11)	(13)	(7)	(11)
Non-voluntary	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Resignations (2015)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Workforce at end of year	**240**	**233**	**220**	**205**	**191**	**178**	**164**	**147**	**128**	**115**	**98**
Vacancy Rate	*(15.8%)*	*(18.2%)*	*(22.8%)*	*(28.1%)*	*(33.0%)*	*(37.5%)*	*(42.5%)*	*(48.4%)*	*(55.1%)*	*(59.6%)*	*(65.6%)*
Cumulative Hiring Needs	**45**	**52**	**65**	**80**	**94**	**107**	**121**	**138**	**157**	**170**	**187**
Year-by-Year Hiring Needs	**45**	**7**	**13**	**15**	**14**	**13**	**14**	**17**	**19**	**13**	**17**

Appendix C: Ten-Year Retirement Projection



WSDOT Retirements in Each Calendar Year, 2016-2026

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Total
All Classifications	**65**	**23**	**31**	**25**	**40**	**33**	**55**	**61**	**70**	**61**	**57**	**521**
Transportation Engineer Classifications and Transportation Technical Engineers	48	18	23	13	31	22	46	48	55	53	45	**402**
Property & Acquisition Specialist Classifications	10	4	1	3	1	4	1	2	2	1	1	**30**
Transportation Technician Classifications	7	1	7	9	8	7	8	11	13	7	11	**89**

Appendix D: Detailed Compensation Comparison Tables

Transportation Engineer and Transportation Technical Engineer Classifications

Transportation Engineer 1 Wage Comparisons

	Job Title/Classification	Minimum	Midpoint	Maximum	Maximum + Longevity
WSDOT	**Transportation Engineer 1**	**$44,880**	**$51,462**	**$58,956**	**$60,420**
Clark County	Engineer I	$51,147	$57,803	$65,291	$65,291
King County	Engineer I	$63,539	$72,508	$80,832	$80,832
Pierce County	Civil Engineer I	$70,096	$79,217	$88,338	$88,338
Spokane	Engineer In Training	$56,856	$63,339	$69,823	$69,823
Spokane County	Engineer 1	$46,025	$54,064	$62,103	$64,503
Median (exclu WSDOT)	**-**	**$56,856**	**$63,339**	**$69,823**	**$69,823**
WSDOT Variance from Median	**-**	**-21.1%**	**-18.8%**	**-15.6%**	**-13.5%**
Rank	**-**	**6 of 6**	**6 of 6**	**6 of 6**	**6 of 6**

Transportation Engineer 2 Wage Comparisons

	Job Title/Classification	Minimum	Midpoint	Maximum	Maximum + Longevity
WSDOT	**Transportation Engineer 2**	**$49,608**	**$56,826**	**$65,088**	**$66,684**
Clark County	Engineer II	$59,197	$66,872	$75,566	$75,566
King County	Engineer II	$71,675	$81,822	$91,241	$91,241
Seattle	Civil Engineer, Associate	$79,851	$86,258	$93,184	$93,184
Spokane County	Engineer 2	$51,139	$60,072	$69,004	$71,404
Vancouver	Associate Civil Engineer	$67,692	$77,844	$87,996	$87,996
Median (exclu WSDOT)	**-**	**$67,692**	**$77,844**	**$87,996**	**$87,996**
WSDOT Variance from Median	**-**	**-26.7%**	**-27.0%**	**-26.0%**	**-24.2%**
Rank	**-**	**6 of 6**	**6 of 6**	**6 of 6**	**6 of 6**

Transportation Engineer 3 Wage Comparisons

	Job Title/Classification	Minimum	Midpoint	Maximum	Maximum + Longevity
WSDOT	**Transportation Engineer 3**	**$54,744**	**$62,700**	**$71,844**	**$73,644**
Clark County	Engineer II	$59,197	$66,872	$75,566	$75,566
King County	Engineer III	$80,881	$92,352	$102,289	$102,289
Pierce County	Civil Engineer 2	$79,165	$89,690	$100,214	$100,214
Sound Transit	Civil Engineer	$68,784	$103,177	$123,812	$123,812
Spokane	Associate Traffic Engineer	$65,897	$73,518	$81,140	$81,140
Spokane County	Engineer 3	$63,135	$74,164	$85,193	$87,593
Median (exclu WSDOT)	**-**	**$67,341**	**$81,927**	**$92,703**	**$93,903**
WSDOT Variance from Median	**-**	**-18.7%**	**-23.5%**	**-22.5%**	**-21.6%**
Rank	**-**	**7 of 7**	**7 of 7**	**7 of 7**	**7 of 7**

Transportation Engineer 4 Wage Comparisons

	Job Title/Classification	Minimum	Midpoint	Maximum	Maximum + Longevity
WSDOT	**Transportation Engineer 4**	**$60,420**	**$69,234**	**$79,296**	**$81,264**
Clark County	Engineer III	$68,474	$77,438	$87,526	$87,526
King County	Engineer IV	$91,297	$103,461	$114,618	$114,618
Pierce County	Civil Engineer 3	$89,190	$101,327	$113,464	$113,464
Seattle	Civil Engineer, Senior	$99,278	$106,954	$115,586	$115,586
Sound Transit	Senior Civil Engineer	$79,626	$119,440	$143,328	$143,328
Spokane	Senior Traffic Engineer	$78,070	$85,608	$93,146	$93,146
Spokane County	Engineer 4	$70,151	$82,405	$94,659	$94,659
Median (exclu WSDOT)	**-**	**$79,626**	**$101,327**	**$113,464**	**$113,464**
WSDOT Variance from Median	**-**	**-24.1%**	**-31.7%**	**-30.1%**	**-28.4%**
Rank	**-**	**8 of 8**	**8 of 8**	**8 of 8**	**8 of 8**

Transportation Engineer 5 Wage Comparisons

	Job Title/Classification	Minimum	Midpoint	Maximum	Maximum + Longevity
WSDOT	**Transportation Engineer 5**	**$66,684**	**$76,398**	**$87,528**	**$89,712**
King County	Engineering Services Manager	$109,562	$124,208	$137,799	$137,799
Pierce County	Engineer Manager	$100,491	$114,342	$128,193	$128,193
Seattle	Civil Engineer, Supervisor	$107,453	$115,773	$124,613	$124,613
Sound Transit	Civil Engineering Supervisor	$87,788	$131,682	$158,018	$158,018
Spokane	Principal Engineer	$88,824	$99,264	$109,704	$109,704
Vancouver	Civil Engineer	$75,000	$86,250	$97,500	$97,500
Median (exclu WSDOT)	**-**	**$94,657**	**$115,057**	**$126,403**	**$126,403**
WSDOT Variance from Median	**-**	**-29.6%**	**-33.6%**	**-30.8%**	**-29.0%**
Rank	**-**	**7 of 7**	**7 of 7**	**7 of 7**	**7 of 7**

Transportation Technical Engineer Wage Comparisons

	Job Title/Classification	Minimum	Midpoint	Maximum	Maximum + Longevity
WSDOT	**Transportation Technical Engineer**	**$66,684**	**$76,398**	**$87,528**	**$89,712**
Sound Transit	Electrical Engineer	$79,626	$119,440	$143,328	$143,328
Spokane County	Engineering Office Administrator	$66,667	$78,313	$89,958	$89,958
King County	Engineer II	$69,965	$81,822	$89,057	$89,057
Median (exclu WSDOT)	**-**	**$69,965**	**$81,822**	**$89,958**	**$89,958**
WSDOT Variance from Median	**-**	**-4.7%**	**-6.6%**	**-2.7%**	**-0.3%**
Rank	**-**	**2 of 3**	**3 of 3**	**3 of 3**	**3 of 3**

Transportation Technician Classifications

Transportation Technician 1 Wage Comparisons

	Job Title/Classification	Minimum	Midpoint	Maximum	Maximum + Longevity
WSDOT	**Transportation Technician 1**	**$34,476**	**$39,228**	**$44,880**	**$46,056**
Clark County	Engineering Technician Assistant	$44,221	$49,920	$56,410	$56,410
King County	Engineering Technician I	$48,811	$55,647	$61,993	$61,993
Pierce County	Engineering Technician 1	$48,901	$51,927	$54,954	$54,954
Spokane [1]	Engineering Technician 1	$34,870	$42,480	$50,091	$50,822
Spokane County	Engineering Technician 1	$34,296	$40,287	$46,278	$48,678
Median (exclu WSDOT)	**-**	**$44,221**	**$49,920**	**$54,954**	**$54,954**
WSDOT Variance from Median	**-**	**-22.0%**	**-21.4%**	**-18.3%**	**-16.2%**
Rank	**-**	**5 of 6**	**6 of 6**	**6 of 6**	**6 of 6**

Transportation Technician 2 Wage Comparisons

	Job Title/Classification	Minimum	Midpoint	Maximum	Maximum + Longevity
WSDOT	**Transportation Technician 2**	**$39,708**	**$45,468**	**$52,080**	**$53,424**
Clark County	Engineering Technician	$53,747	$57,803	$65,291	$65,291
King County	Engineering Technician II	$53,709	$61,256	$68,259	$68,259
Pierce County	Engineering Technician 2	$55,266	$62,452	$69,638	$69,638
Sound Transit	Design Technology Spec	$59,419	$89,128	$106,954	$106,954
Spokane	Engineering Technician 2	$38,252	$46,688	$55,123	$55,854
Spokane County	Engineering Technician 2	$39,840	$46,798	$53,757	$56,157
Vancouver	Engineering Technician 1	$45,000	$50,766	$57,528	$57,528
Median (exclu WSDOT)	**-**	**$53,709**	**$57,803**	**$65,291**	**$65,291**
WSDOT Variance from Median	**-**	**-26.1%**	**-21.3%**	**-20.2%**	**-18.2%**
Rank	**-**	**6 of 7**	**7 of 7**	**7 of 7**	**7 of 7**

Transportation Technician 3 Wage Comparisons

	Job Title/Classification	Minimum	Midpoint	Maximum	Maximum + Longevity
WSDOT	**Transportation Technician 3**	**$44,880**	**$51,462**	**$58,956**	**$60,420**
Clark County	Engineering Technician Senior	$59,197	$66,872	$75,566	$75,566
Pierce County	Engineering Technician 3	$66,123	$75,098	$84,074	$84,074
Sound Transit	Senior Design Technology Specialist	$65,509	$98,263	$117,916	$117,916
Spokane	Field Engineer	$65,897	$73,518	$81,140	$81,140
Spokane County	Engineering Technician 3	$45,590	$53,553	$61,517	$63,917
Median (exclu WSDOT)	**-**	**$65,509**	**$73,518**	**$81,140**	**$81,140**
WSDOT Variance from Median	**-**	**-31.5%**	**-30.0%**	**-27.3%**	**-25.5%**
Rank	**-**	**6 of 6**	**6 of 6**	**6 of 6**	**6 of 6**

Property & Acquisition Specialist Classifications

Property & Acquisition Specialist 1 Wage Comparisons

	Job Title/Classification	Minimum	Midpoint	Maximum	Maximum + Longevity
WSDOT	**Property & Acquisition Specialist 1**	**$34,476**	**$39,228**	**$44,880**	**$46,056**
Clark County	Real Property Agent I	$46,363	$52,416	$60,320	$60,320
King County	Real Property Agent I	$59,117	$67,446	$75,176	$75,176
Pierce County	Right of Way Agent 1	$62,358	$70,699	$79,040	$79,040
Spokane County	Residential Appraiser Trainee	$25,290	$29,708	$34,125	$36,525
Median (exclu WSDOT)	**-**	**$52,740**	**$59,931**	**$67,748**	**$67,748**
WSDOT Variance from Median	**-**	**-34.6%**	**-34.5%**	**-33.8%**	**-32.0%**
Rank	**-**	**4 of 5**	**4 of 5**	**4 of 5**	**4 of 5**

Property & Acquisition Specialist 2 Wage Comparisons

	Job Title/Classification	Minimum	Midpoint	Maximum	Maximum + Longevity
WSDOT	**Property & Acquisition Specialist 2**	**$40,704**	**$46,632**	**$53,424**	**$54,744**
Clark County	Real Property Agent II	$53,747	$60,674	$68,474	$68,474
King County	Real Property Agent II	$65,087	$74,279	$82,813	$82,813
Pierce County	Right of Way 2	$70,138	$79,882	$89,627	$89,627
Seattle	Real Property Agent	$72,010	$77,792	$84,198	$84,198
Spokane County	Residential Appraiser	$34,814	$40,895	$46,977	$49,377
Median (exclu WSDOT)	**-**	**$65,087**	**$74,279**	**$82,813**	**$82,813**
WSDOT Variance from Median	**-**	**-37.5%**	**-37.2%**	**-35.5%**	**-33.9%**
Rank	**-**	**5 of 6**	**5 of 6**	**5 of 6**	**5 of 6**

Property & Acquisition Specialist 3 Wage Comparisons

	Job Title/Classification	Minimum	Midpoint	Maximum	Maximum + Longevity
WSDOT	**Property & Acquisition Specialist 3**	**$46,056**	**$52,752**	**$60,420**	**$61,920**
Clark County	Real Property Agent III	$59,197	$66,872	$75,566	$75,566
King County	Real Property Agent III	$75,220	$85,883	$95,590	$95,590
Pierce County	Right of Way Agent 2	$70,138	$79,882	$89,627	$89,627
Seattle	Real Property Agent, Senior	$85,717	$92,685	$99,986	$99,986
Sound Transit	Real Property Coordinator	$51,328	$76,992	$92,390	$92,390
Spokane County	Residential Property Appraiser Supervisor	$38,471	$38,471	$51,911	$54,311
Median (exclu WSDOT)	**-**	**$64,667**	**$78,437**	**$91,009**	**$91,009**
WSDOT Variance from Median	**-**	**-28.8%**	**-32.7%**	**-33.6%**	**-32.0%**
Rank	**-**	**6 of 7**	**6 of 7**	**6 of 7**	**6 of 7**

Property & Acquisition Specialist 4 Wage Comparisons

	Job Title/Classification	Minimum	Midpoint	Maximum	Maximum + Longevity
WSDOT	**Property & Acquisition Specialist 4**	**$49,608**	**$56,826**	**$65,088**	**$66,684**
King County	Real Property Agent IV	$86,974	$98,884	$109,502	$109,502
Pierce County	Appraiser 2	$61,069	$69,233	$77,397	$77,397
Pierce County	Real Property Management Specialist 1	$62,358	$70,699	$79,040	$79,040
Sound Transit	Real Property Agent	$65,509	$98,263	$117,916	$117,916
Median (exclu WSDOT)	**-**	**$63,934**	**$84,481**	**$94,271**	**$94,271**
WSDOT Variance from Median	**-**	**-22.4%**	**-32.7%**	**-31.0%**	**-29.3%**
Rank	**-**	**5 of 5**	**5 of 5**	**5 of 5**	**5 of 5**

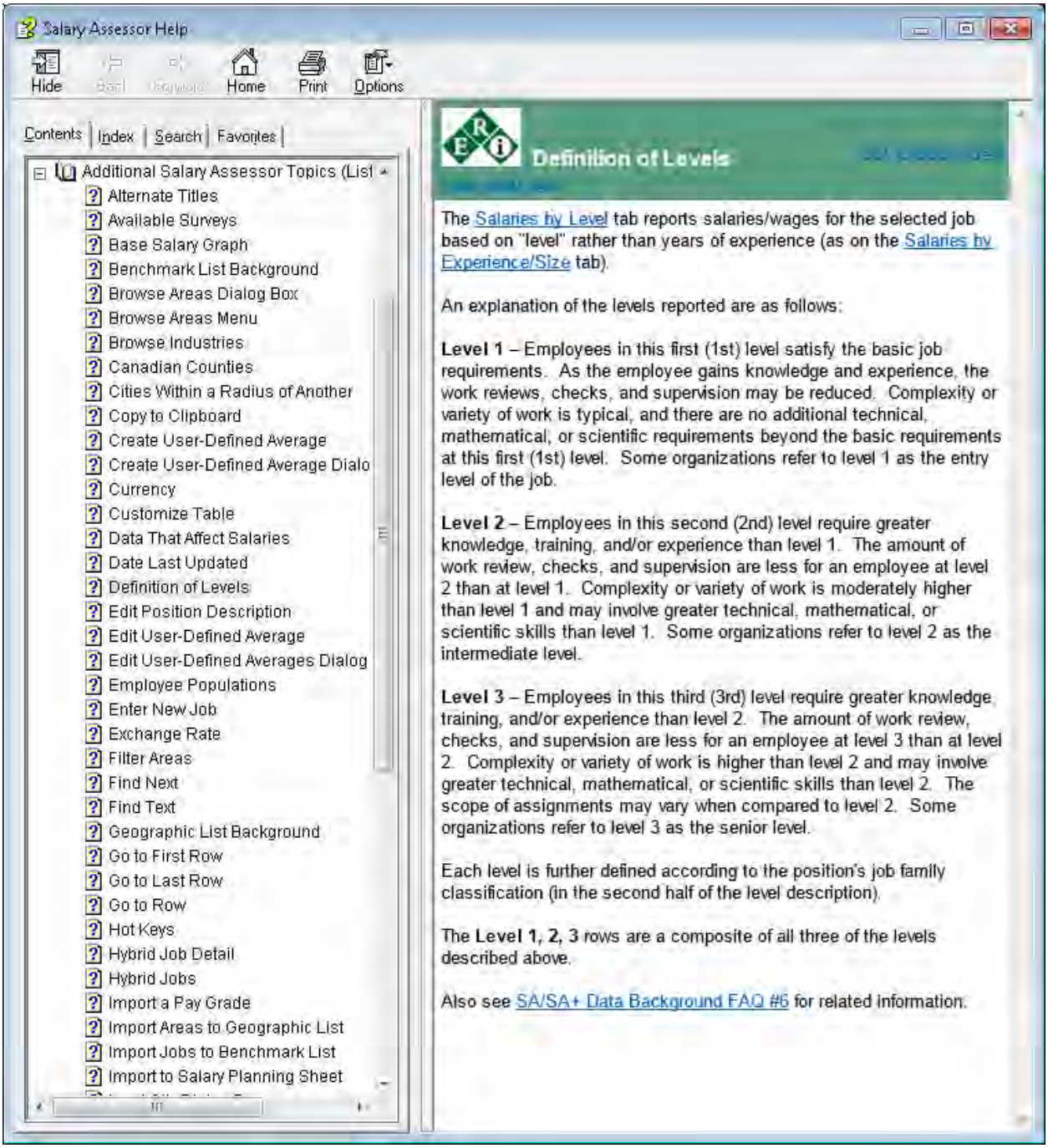
Property & Acquisition Specialist 5 Wage Comparisons

	Job Title/Classification	Minimum	Midpoint	Maximum	Maximum + Longevity
WSDOT	**Property & Acquisition Specialist 5**	**$53,424**	**$61,170**	**$70,056**	**$71,844**
King County	Real Property Agent Supervisor	$95,641	$108,270	$119,989	$119,989
Pierce County	Appraiser 3	$64,771	$73,549	$82,326	$82,326
Pierce County	Real Property Management Specialist 2	$70,138	$79,882	$89,627	$89,627
Pierce County	Right of Way Agent 3	$79,040	$86,133	$93,226	$93,226
Sound Transit	Sr. Real Property Agent	$72,224	$108,335	$130,002	$130,002
Spokane	Real Estate Manager	$70,825	$78,832	$86,840	$86,840
Median (exclu WSDOT)	**-**	**$71,524**	**$83,008**	**$91,426**	**$91,426**
WSDOT Variance from Median	**-**	**-25.3%**	**-26.3%**	**-23.4%**	**-21.4%**
Rank	**-**	**7 of 7**	**7 of 7**	**7 of 7**	**7 of 7**

Property & Acquisition Specialist 6 Wage Comparisons

	Job Title/Classification	Minimum	Midpoint	Maximum	Maximum + Longevity
WSDOT	**Property & Acquisition Specialist 6**	**$56,136**	**$64,284**	**$73,644**	**$75,456**
Pierce County [1]	Appraiser Supervisor	$72,904	$83,138	$93,371	$93,371
Spokane County	Engineering Real Estate Services Manager	$60,602	$71,188	$81,774	$81,974
Median (exclu WSDOT)	**-**	**$66,753**	**$77,163**	**$87,573**	**$87,673**
WSDOT Variance from Median	**-**	**-15.9%**	**-16.7%**	**-15.9%**	**-13.9%**
Rank	**-**	**3 of 3**	**3 of 3**	**3 of 3**	**3 of 3**

Appendix E: ERI Level Definitions



Appendix F: Market-Specific WSDOT Pay Variance (Recommendation 10.1)

Northwest Region

	King County	Seattle	Sound Transit	ERI Seattle	ERI Mt. Vernon	Median
Transportation Engineer 1	$80,832	-	-	-	-	**$80,832**
Transportation Engineer 2	$91,241	$93,184	-	$88,320	$83,052	**$89,781**
Transportation Engineer 3	$102,289	-	$123,812	-	-	**$113,051**
Transportation Engineer 4	$114,618	$115,586	$143,328	-	-	**$115,586**
Transportation Engineer 5	$137,799	$124,613	$158,018	-	-	**$137,799**
Transportation Technical Engineer	$89,057	-	$143,328	-	-	**$116,193**
Transportation Technician 1	$61,993	-	-	-	-	**$61,993**
Transportation Technician 2	$68,259	-	$106,954	-	-	**$87,607**
Transportation Technician 3	-	-	$117,916	$69,204	$64,980	**$69,204**
Property & Acquisition Specialist 1	$75,716	-	-	-	-	**$75,716**
Property & Acquisition Specialist 2	$82,813	$84,198	-	-	-	**$83,506**
Property & Acquisition Specialist 3	$95,590	$99,986	$92,390	$71,580	$68,352	**$92,390**
Property & Acquisition Specialist 4	$109,502	-	$117,916	-	-	**$113,709**
Property & Acquisition Specialist 5	$119,989	-	$130,002	-	-	**$124,996**
Property & Acquisition Specialist 6	-	-	-	-	-	**-**

	WSDOT Maximum Base	Market Median at Maximum Base	WSDOT Variance from Median
Transportation Engineer 1	$58,956	$80,832	-27.1%
Transportation Engineer 2	$65,088	$89,781	-27.5%
Transportation Engineer 3	$71,844	$113,051	-36.4%
Transportation Engineer 4	$79,296	$115,586	-31.4%
Transportation Engineer 5	$87,528	$137,799	-36.5%
Transportation Technical Engineer	$87,528	$116,193	-24.7%
Transportation Technician 1	$44,880	$61,993	-27.6%
Transportation Technician 2	$52,080	$87,607	-40.6%
Transportation Technician 3	$58,956	$69,204	-14.8%
Property & Acquisition Specialist 1	$44,880	$75,716	-40.7%
Property & Acquisition Specialist 2	$53,424	$83,506	-36.0%
Property & Acquisition Specialist 3	$60,420	$92,390	-34.6%
Property & Acquisition Specialist 4	$65,088	$113,709	-42.8%
Property & Acquisition Specialist 5	$70,056	$124,996	-44.0%
Property & Acquisition Specialist 6	$73,644	-	-
Average	**-**	**-**	**-33.2%**

Olympic Region

	Pierce County	ERI Tacoma	ERI Olympia	Median
Transportation Engineer 1	$88,338	-	-	**$88,338**
Transportation Engineer 2	-	$85,716	$81,360	**$83,538**
Transportation Engineer 3	$100,214	-	-	**$100,214**
Transportation Engineer 4	$113,464	-	-	**$113,464**
Transportation Engineer 5	$128,193	-	-	**$128,193**
Transportation Technical Engineer	-	-	-	**-**
Transportation Technician 1	$54,954	-	-	**$54,954**
Transportation Technician 2	$69,638	-	-	**$69,638**
Transportation Technician 3	$84,074	$66,264	$62,976	**$66,264**
Property & Acquisition Specialist 1	$79,040	-	-	**$79,040**
Property & Acquisition Specialist 2	$89,627	-	-	**$89,627**
Property & Acquisition Specialist 3	$89,627	$68,388	$66,228	**$68,388**
Property & Acquisition Specialist 4	$78,219	-	-	**$78,219**
Property & Acquisition Specialist 5	$88,393	-	-	**$88,393**
Property & Acquisition Specialist 6	$93,371	-	-	**$93,371**

	WSDOT Maximum Base	Market Median at Maximum Base	WSDOT Variance from Median
Transportation Engineer 1	$58,956	$88,338	-33.3%
Transportation Engineer 2	$65,088	$83,538	-22.1%
Transportation Engineer 3	$71,844	$100,214	-28.3%
Transportation Engineer 4	$79,296	$113,464	-30.1%
Transportation Engineer 5	$87,528	$128,193	-31.7%
Transportation Technical Engineer	$87,528	-	-
Transportation Technician 1	$44,880	$54,954	-18.3%
Transportation Technician 2	$52,080	$69,638	-25.2%
Transportation Technician 3	$58,956	$66,264	-11.0%
Property & Acquisition Specialist 1	$44,880	$79,040	-43.2%
Property & Acquisition Specialist 2	$53,424	$89,627	-40.4%
Property & Acquisition Specialist 3	$60,420	$68,388	-11.7%
Property & Acquisition Specialist 4	$65,088	$78,219	-16.8%
Property & Acquisition Specialist 5	$70,056	$88,393	-20.7%
Property & Acquisition Specialist 6	$73,644	$93,371	-21.1%
Average	**-**	**-**	**-25.3%**

Eastern Region

	Spokane County	Spokane	ERI Spokane	Median
Transportation Engineer 1	$62,103	$69,823	-	$65,963
Transportation Engineer 2	$69,004	-	$77,712	$73,358
Transportation Engineer 3	$85,193	$81,140	-	$83,167
Transportation Engineer 4	$94,659	$93,146	-	$93,903
Transportation Engineer 5	-	$109,704	-	$109,704
Transportation Technical Engineer	$89,958	-	-	$89,958
Transportation Technician 1	$46,278	$50,091	-	$48,185
Transportation Technician 2	$53,757	$55,123	-	$54,440
Transportation Technician 3	$61,517	$81,140	$59,784	$61,517
Property & Acquisition Specialist 1	$34,125	-	-	$34,125
Property & Acquisition Specialist 2	$46,977	-	-	$46,977
Property & Acquisition Specialist 3	$51,911	-	$62,916	$57,414
Property & Acquisition Specialist 4	-	-	-	-
Property & Acquisition Specialist 5	-	$86,840	-	$86,840
Property & Acquisition Specialist 6	$81,774	-	-	$81,774

	WSDOT Maximum Base	Market Median at Maximum Base	WSDOT Variance from Median
Transportation Engineer 1	$58,956	$65,963	-10.6%
Transportation Engineer 2	$65,088	$73,358	-11.3%
Transportation Engineer 3	$71,844	$83,167	-13.6%
Transportation Engineer 4	$79,296	$93,903	-15.6%
Transportation Engineer 5	$87,528	$109,704	-20.2%
Transportation Technical Engineer	$87,528	$89,958	-2.7%
Transportation Technician 1	$44,880	$48,185	-6.9%
Transportation Technician 2	$52,080	$54,440	-4.3%
Transportation Technician 3	$58,956	$61,517	-4.2%
Property & Acquisition Specialist 1	$44,880	$34,125	31.5%
Property & Acquisition Specialist 2	$53,424	$46,977	13.7%
Property & Acquisition Specialist 3	$60,420	$57,414	5.2%
Property & Acquisition Specialist 4	$65,088	-	-
Property & Acquisition Specialist 5	$70,056	$86,840	-19.3%
Property & Acquisition Specialist 6	$73,644	$81,774	-9.9%
Average	**-**	**-**	**-4.9%**

Southwest Region

	Clark County	Vancouver	ERI Vancouver	Median
Transportation Engineer 1	$65,291	-	-	$65,291
Transportation Engineer 2	$75,566	$87,996	$84,000	$84,000
Transportation Engineer 3	$75,566	-	-	$75,566
Transportation Engineer 4	$87,526	-	-	$87,526
Transportation Engineer 5	-	$97,500	-	$97,500
Transportation Technical Engineer	-	-	-	-
Transportation Technician 1	$56,410	-	-	$56,410
Transportation Technician 2	$65,291	$57,528	-	$61,410
Transportation Technician 3	$75,566	-	$64,044	$69,805
Property & Acquisition Specialist 1	$60,320	-	-	$60,320
Property & Acquisition Specialist 2	$68,474	-	-	$68,474
Property & Acquisition Specialist 3	$75,566	-	$67,404	$71,485
Property & Acquisition Specialist 4	-	-	-	-
Property & Acquisition Specialist 5	-	-	-	-
Property & Acquisition Specialist 6	-	-	-	-

	WSDOT Maximum Base	Market Median at Maximum Base	WSDOT Variance from Median
Transportation Engineer 1	$58,956	$65,291	-9.7%
Transportation Engineer 2	$65,088	$84,000	-22.5%
Transportation Engineer 3	$71,844	$75,566	-4.9%
Transportation Engineer 4	$79,296	$87,526	-9.4%
Transportation Engineer 5	$87,528	$97,500	-10.2%
Transportation Technical Engineer	$87,528	-	-
Transportation Technician 1	$44,880	$56,410	-20.4%
Transportation Technician 2	$52,080	$61,410	-15.2%
Transportation Technician 3	$58,956	$69,805	-15.5%
Property & Acquisition Specialist 1	$44,880	$60,320	-25.6%
Property & Acquisition Specialist 2	$53,424	$68,474	-22.0%
Property & Acquisition Specialist 3	$60,420	$71,485	-15.5%
Property & Acquisition Specialist 4	$65,088	-	-
Property & Acquisition Specialist 5	$70,056	-	-
Property & Acquisition Specialist 6	$73,644	-	-
Average	**-**	**-**	**-15.5%**

APPENDIX D

OVERVIEW OF WSDOT CONTRUCTION TRAININGS

The following are the titles of training available to construction personnel at the Washington State Department of Transportation:

Online Training:

Acceptance and Approval of Material

Composing An Inspector's Daily Report

Concrete Bridge Decks

Earthwork Inspection

Electrical Conductors and Fiber

Electrical Conduit and J-Box

Electrical Controllers and Cameras

Electrical Poles and Foundations

Field Painting Structural Steel

Force Account Documentation and Payment

Forms and Falsework

Guardrail Installation for Inspectors

Hazmat for the Portable Nuclear Gauge

HMA Placement Inspection (Hot Mix Asphalt)

Inspection of Pedestrian Facilities

Inspector Certification Resources for Guardrail Installation

Inspector's Role for Change Order Work

Inspector's Use of Contract Resources

Nuclear Gauge Safety and Operations

Pile Driving Inspection

Portland Cement Concrete Inspection

Producing Source Documents

Sign Bridges and Cantilever Signs

Sign Inspector Duties

Small and Large Sign Inspection Review

Training for Inspector Daily Report

Work Zone Traffic Control

Spill Plan Reviewer Training

Instructor Led Training:

Aggregate Production & Testing Inspection
Bituminous Surface Treatment Inspection
Annual Asphalt Pavement Training Conference
Construction inspection Documentation
Construction Materials, Approval and Acceptance
Drainage Inspection
Electrical-Illumination-Signals & ITS Inspection
Excavation & Embankment Inspection
Guardrail installation for Inspectors
Hot Mix Asphalt Placement
Hot Mix Asphalt Production & Testing
Inspecting Bridge Construction
Nuclear Gauge Safety and Operation
Nuclear Gauge, Embankment/Surfacing/Pavement
Pavement Rehabilitation
PCC Field Testing Procedures
Sign Installation Inspection
Roadside Safety Manual Training
Highway Runoff Manual Training
Construction Site Erosion and Sediment Control
Cultural Resource Training
Cultural Resources Procedures and Policies
Environmental Compliance for Construction
ESA Illicit Discharge Detection Elimination (IDDE)
First Passage Construction Compliance

Self-Studies:

Contract Plans Overview

Contract Plans Reading Course

Technical Math I and II

Basic Surveying

APPENDIX E

INCLUSION WORK PLAN

Washington State Department of Transportation Diversity and Inclusion Plan

Washington State Department of Transportation

Office of Human Resources and Safety
310 Maple Park Avenue
Olympia, WA 98504-7310

Overview

The plan provides a shared direction, encourages commitment and creates alignment so the agency can approach the workplace diversity and inclusion efforts in a coordinated, collaborative and integrated manner. This plan will have three areas of focus, workforce diversity, workforce inclusion and sustainability.

The strategies contained in this plan will be implemented in 2016-2017. The Office of Human Resources & Safety will oversee the implementation of these strategies to promote leadership and employee engagement on diversity and inclusion issues. This plan will help the agency take positive steps to ensure equal employment opportunity guidelines apply to all employment practices and decisions throughout WSDOT. WSDOT strives to build a workplace that is respectful and inclusive and free from harassment and discrimination.

Agency's Commitment Statement

The Washington State Department of Transportation serves people in every community, economic class and cultural group throughout the state. As such, we will meet our mission and vision only when the work we do reflects the principles of equal opportunity, diversity, affirmative action and cross-cultural respect.

The Department of Transportation is committed to Washington's statewide affirmative action and diversity efforts. Equal Employment Opportunity (EEO) is not only the law, but it is fundamental to the Department's operations and success in meeting the transportation needs of Washington state and providing the best possible service to the people of Washington.

The Department of Transportation will take steps to ensure equitable participation in all business and employment practices without regard to race, color, religion, sex, national origin, age, disability, veteran status, marital status or sexual orientation. In doing so, the Department will strive to establish a workforce representative of the public we serve by promoting a program of Affirmative Action and outreach to identify and eliminate employment barriers to women, minority groups, veterans and persons with disabilities.

All employees, supervisors and managers will be held accountable for their actions in carrying out the expectation to maintain a workplace free of discrimination, harassment and retaliation.

Diversity and Inclusion

Diversity is imbedded in the agency's Goal 4, *Organizational Strength,* "to support a culture of multi-disciplinary teams, innovation and people development through training, continuous improvement and Lean efforts."

Inclusion is an agency value. Inclusion is defined as "ensuring a wide array of perspectives, disciplines and backgrounds are represented in our outreach, decision making and workforce." In order to keep inclusion a priority in the agency, it has also been identified as one of the three agency emphasis areas. WSDOT is committed to building a workforce that looks like the diverse communities the agency serves. Additionally, all businesses desiring to work with WSDOT will have fair and equal access to contracting opportunities. In order to be accountable to all citizens of Washington, WSDOT strives to be sensitive to the cultures of the many diverse communities the agency serves.

Goals:

1. **Workforce Diversity:** Identify opportunities to enhance a diverse workforce through innovative retention and recruitment strategies.

2. **Workforce Inclusion:** Cultivate a culture that encourages collaboration, flexibility, and fairness to enable individuals to contribute to their full potential and further retention.

3. **Sustainably:** Demonstrate continuous leadership commitment to diversity and inclusion.

Goal 1: Workforce Diversity

Identify opportunities to enhance a diverse workforce through innovative retention and recruitment strategies.

Strategy 1.1: *Ensure the WSDOT recruitment process reaches and appeals to a diverse and highly qualified pool of candidates.*

Action Items:

1. Actively assess utilization and applicant flow data to determine whether recruitment strategies yield the expected results.
2. Continue to evaluate recruitment procedures to ensure consistency and comprehensive outreach to a diverse population. In addition, the recruitment process will be evaluated for potential barriers to increase equity in the process.
3. Participation with recruiters, Diversity Advisory Group (DAG) and department staff for career fairs and community outreach events, specifically the events presented by diverse and/or disadvantage groups and organizations.
4. Agency branding – utilize a variety of platforms – such as social media, job boards, listservs and print that target demographically diverse audiences.
5. Enhance activities to support workforce needs across WSDOT by increasing the pool of diverse candidates interested in pipeline programs, such as the Agency's Transportation Engineer 1, Transportation Engineer Internship and Maintenance Technician 2 In-training programs.
6. Establish contacts and broaden relationships with colleges, universities and technical trade schools, including those considered "Minority Institution" by the U.S. Department of Education.
7. Strengthen and broaden relationship with diverse local, national and professional organizations that provide opportunities to source potential applications for general service, management and executive-level positions.

Strategy 1.2: *Develop and broaden community partnerships.*

Action Items:

1. Partner with the African American Affairs Commission, the Commission on Hispanic Affairs, the Governor's Office of Indian Affairs, and the Asian Pacific American Affairs Commission on community outreach and diversity initiatives.
2. Collaborate with the Office of Equal Opportunity and other agency divisions on community engagement event.
3. Continue participation and maintain representation on inter-agency committees, resource groups and taskforce.
4. Participate in outreach and job networking events with community organizations (women, minority groups, veterans and persons with disabilities.)
5. Establish contacts and/or partner with pre-apprenticeship and trades programs as possible talent pipelines.

6. Collaborate with Department of Corrections, Correctional Industries and other reentry programs to promote job opportunities and providing information on the agency's recruitment process.

Goal 2: Workforce Inclusion

Cultivate a culture that encourages collaboration, flexibility, and fairness to enable individuals to contribute to their full potential and further retention.

Strategy 2.1: *Cultivate a supportive, welcoming, inclusive and fair work environment.*

1. Provide consistent message relating to diversity and inclusion in new employee orientation to ensure awareness and understanding of WSDOT's vision and values.
2. Encourage and increase exit interview participation to employees departing the agency. Data will help the agency identify reasons employees choose to leave the organization and can be utilized to enhance working conditions to promote inclusive environment and retention.
3. Leverage the state's employee engagement survey to gain an understanding and perspective of employees, on how the agency is doing and whether WSDOT is offering the support needed for staff to do their job well.
4. Provide customized consultation with managers on exit surveys and state employee engagement survey results.
5. When appropriate, encourage the use of flexible workplace polices that support employee engagement, including telework, wellness programs, commute trip reduction (CTR) incentives and other work-life flexibilities and benefits.
6. Continue to encourage training opportunities and tools such as Skillsoft to employees to promote skill development.
7. When appropriate, offer reimbursement of certifications, organizational membership and /or tuition.
8. Assess mentorship opportunities within the agency.
9. Explore opportunities to expand modern work environment spaces and programs such as the Infants in the Workplace program.

Strategy 2.2: *Evaluate and expand career development paths to meet WSDOT's mission needs through workforce initiatives and existing programs.*

Action Items:

1. Remain transparent regarding job opportunities and support employees seeking growth by ensuring job postings are advertised on the agency's employment website and listerv.
2. Continue in-training avenues and programs that provide opportunities for employees through professional growth development and career paths. As resources allow, provide internal employees non-permanent opportunities to learn new skills and gain knowledge about the higher level positions.
3. Create job rotations, cross-training and developmental job assignments as opportunities wherever possible.

4. Identify opportunities for succession planning via Workforce Development efforts to broaden career path that meet current and future department needs.
5. Encourage Individual Development Plans (IDP) to promote the agency's commitment to growth and development.
6. Within available resources, encourage employees to obtain professional certifications and continuing education in their field.
7. Continue to encourage participation in developmental training such as, but not limited to, LEAN, Change Management, Speed of Trust, CPI 260 and Four Lenses.

Goal 3: Sustainability

Demonstrate continuous leadership commitment to diversity and inclusion.

Strategy 3.1: *Demonstrate leadership accountability, commitment, and involvement regarding diversity and inclusion in the workplace.*

Action Items:

1. Affirm the value of workforce diversity and inclusion in the agency's strategic plan and include them in workforce planning activities.
2. Continue to implement diversity and inclusion plan through collaboration and coordination of the Office of Human Resource & Safety.
3. Include core competency and measurements as it relates to diversity and inclusion in the agency's performance management system to ensure accountability and mandatory training are being met.
4. Evaluate and develop a tiered approach in leadership training to offer progressive and effective leadership development. The focus will be on building, enhancing and evolving leadership skills and expanding current and future leaders' knowledge to continuously grow and remain effective.
5. Create opportunities for executives and management to demonstrate commitment to and support of diversity and inclusion.

Strategy 3.2: *Foster the acceptance of diversity and inclusion through existing programs and continuous learning efforts.*

Action Items:

1. Continue to provide diversity training for employees in an online environment to ensure the Agency is meeting goals for mandatory training.
2. Continue Cultural Competency training for the Senior Leaders and staff.
3. Continue leadership support and leverage the agency's Diversity Advisory Group (DAG) activities to expand awareness of diversity and inclusion throughout the state.
4. Create additional methods for communicating the agency's commitment to and value of diversity and inclusion to its workforce.

APPENDIX F

JTC RECOMMENDATIONS PROGRESS REPORT AND WORK PLAN

WSDOT Construction Division
Design Build Program

Periodic Progress Report

Date: 09/20/17

Progress Summary

ITEM	% COMPLETE	COMMENT
RFQ Templates	100.00	Completion Dates: WSDOT 04/14/17 JTC 06/15/17
ITP Templates	100.00	Completion Dates: WSDOT 04/14/17 JTC 06/15/17
RFP Templates (Gen Prov)	100.00	Completion Dates: WSDOT 04/14/17 JTC 06/15/17
RFP Templates (Tech Req)	100.00	Completion Dates: WSDOT 04/14/17 JTC 06/15/17
Manual	61.36	Completion Dates: WSDOT 03/01/17 (Estimated) JTC 09/15/17
Training	70.00	Completion Dates: WSDOT 10/31/17 (Estimated) JTC 06/15/18
All JTC Recommendations	27.45 (Est.)	

JTC Recommendations				
DB Program Development & Management				
1A. Develop and/or update WSDOT's standard DB procurement and contract forms	STARTED 04/13/17 FHWA approval of templates	See Template sections of this progress report Milestone considered to be 100%	100	04/14/17 Complete; Maintenance phase in effect
1B. Finalize and issue updated DB Manual	STARTED	See Manual section of this progress report	61	03/01/17
1C. Develop and implement an internal and external rollout strategy for programmatic documents	STARTED 04/14/17	Concurrent with Template/Manual development Rollout of template document vis DB Program SharePoint site and Construction Bulletin	75	
1D. Maintain and update the contract document templates and DB Manual as additional recommended policies or procurement strategies are adopted	NOT STARTED 08/07/17 - Ongoing	First update of template documents, same schedule as DBB Standard Specs, GSPs	25	
1E. Establish and maintain a database of DB lessons-learned	STARTED		25	
Staffing and Training				
2A. Increase DB Headquarters staff	06/16/16 STARTED	2 Staff Initially, 1 FTE added 08/01/16	75	
2B. Develop and implement a formal DB training and mentoring program to increase DB skills and expertise across the Regions	See items below for detailed information/progress			
Develop Training Modules	STARTED 01/23/17 03/17/17, 03/31/17, 04/10/17, 04/11/17, consultant developed modules submitted for review.	Design-Build 101 complete; other modules to follow Training consultant under contract 03/27/17, 04/13/17 module review comments returned to consultant.	100	06/30/17
Conduct Training	STARTED Training Summit program developed	DB 101 training has been conducted several times Training Summit scheduled for 10/03 & 10/04 in Wenatchee Seattle summit in Jan 2018	50	
Expand mentoring	NOT STARTED	Need sufficient pool of trained staff	0	
Enhance Skills of DB Project Mgrs outside of Puget Sound	NOT STARTED		0	

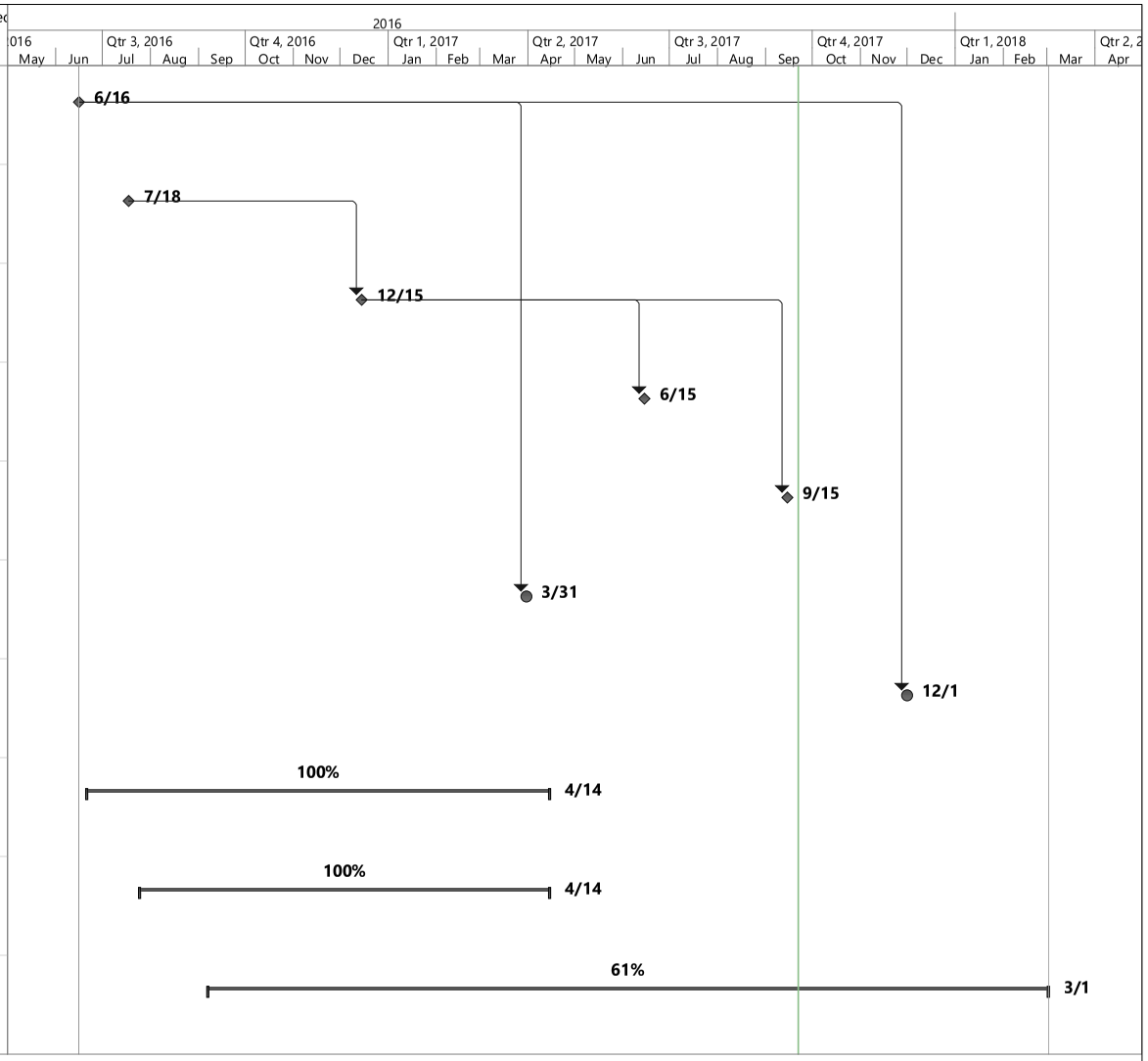
2C. Designate technical experts within DOT to support DB teams	STARTED; See Training section	Individuals to be trained in accordance with Training section	10	
2D. Offer DB credentials and experience (rotation) and a more competitive compensation structure as part of career development/retention plan			10	
2E. Optimize use of consultants			25	
Project Development				
3A. Develop guidance to address Practical Design reviews for DB projects (including how process ties to preliminary engineering and procurement)	STARTED	Applies to projects governed by 2016 Design Manual	5	
3B. Consider market conditions and availability of DOT resources when determining the scope and size of contract packages	04/17/17 STARTED	Discussed at WSDOT/AGC Spring meeting	5	
3C. Develop and implement performance specifications			10	
3D. Perform appropriate levels of front end Investigation				
Delivery Method Selection				
4A. Experiment with alternate DB delivery and procurement methods (e.g., bundling, low bid, single step)	STARTED 09/16/16 with Progressive DB Conference 01/20/17 Coffee Cr. Project, OR	Project may be prototype for alternate DB strategy	30	10/16/17 NTP for Coffee Cr
4B. Refine PDMSG and manual as appropriate based on systematic comparison of the results of using various project delivery strategies (e.g., DB, design-bid-build, and GC/CM)	NOT STARTED STARTED 03/31/17	Draft PDM available on website maintained by Development Division	10	
Procurement				
5A. Streamline procurement process for small DB projects (e.g., expand shortlist, pass/fail qualifications criteria, or use an accelerated process)	Pre 06/16/16 Work under review		5	
5B. Refine evaluation criteria to: Assign greater weight to qualifications and technical evaluation criteria when seeking innovation. Address the prior working relationship of the DB team	STARTED; xx/xx/16 White Paper completed 01/20/17 Coffee Cr. Project, OR	White paper sent to JTC consultant Tech./Price weighting may be altered from current 10/90 ratio	25	
5C. Optimize the efficiency of the ATC Process and1:1 meetings	NOT STARTED	Once started, this recommendation would be an on-going activity and is difficult to quantify.		

5D. Establish and maintain a database of ATCs, and use the data to: Establish preapproved elements to expedite the ATC process. Identify opportunities to introduce more flexibility into current design standards.	STARTED; 09/09/16 folders created on network drive 09/16 to 11/16	Initial request for uploading of project ATCs sent to PEs/Regions ATC data received for 9 projects and several subject areas	15	
5E. Ensure the objectivity of the proposal evaluation process				
Budgeting & Cost Estimating				
6A. Work with legislative staff to more effectively appropriate funds for DB projects	NOT STARTED			
6B. Examine if Engineer Estimates are resulting in an over-allocation of funds and refine estimating process as necessary.	04/17/17 STARTED	Discussed at WSDOT/AGC Spring meeting Cost estimating discussed with Industry on various occasions	25	
Risk				
7A. Develop guidance, for inclusion in the DB Manual, regarding how to use the risk analysis results to assist with: Project development (i.e., level of design development and front-end investigation) Procurement (evaluation criteria) Contractual risk allocation	NOT STARTED 03/01/17	DB Manual development started after revision to TOC. Chapter 3 is titled "Risk Management"	25	12/01/17 DB Manual publicati on date
7B. During the execution phase of a DB project, conduct periodic risk review meetings and regularly update the project risk register.	NOT STARTED			
Project Execution				
8A. Dedicate staff as necessary to the full project lifecycle (design and construction phases)	NOT STARTED	Once started, this recommendation would be an on-going activity and is difficult to quantify		
8B. Dedicate experienced staff with delegated authority to the design oversight function	STARTED	Currently implemented on a project by project basis	25	
8C. Conduct project-specific workshops for larger or complex DB projects	STARTED	Informally implemented on SR520, I-405 Corridor	5	
8D. Optimize quality management for small projects	NOT STARTED		0	
			27.45%	

APPENDIX G

JTC RECOMMENDATIONS SCHEDULE

ID	Task Name	Start	Finish	Predec
1	***WSDOT HQ Construction Re-mobilization***	Thu 6/16/16	Thu 6/16/16	
2	***JTC Draft Report***	Mon 7/18/16	Mon 7/18/16	
3	***JTC Final Report***	Thu 12/15/16	Thu 12/15/16	2
4	***Approved Templates - JTC Schedule***	Thu 6/15/17	Thu 6/15/17	3
5	***Approved Design-Build Manual - JTC Schedule***	Fri 9/15/17	Fri 9/15/17	3
6	**APPROVED TEMPLATES - WSDOT SCHEDULE**	Fri 3/31/17	Fri 3/31/17	1
7	**DRAFT DB MANUAL - WSDOT SCHEDULE**	Fri 12/1/17	Fri 12/1/17	1
8	**RFP Templates (Ch. 2 Technical Requirements)**	**Tue 6/21/16**	**Fri 4/14/17**	
565	**RFQ, ITP, General Provisions Templates (Chapter 1)**	**Mon 7/25/16**	**Fri 4/14/17**	
634	**Design-Build Manual**	**Wed 9/7/16**	**Thu 3/1/18**	



Project: Schedule for Templates
Date: Fri 9/22/17

Task		Project Summary		Manual Task		Start-only		Deadline	
Split		Inactive Task		Duration-only		Finish-only		Progress	
Milestone		Inactive Milestone		Manual Summary Rollup		External Tasks		Manual Progress	
Summary		Inactive Summary		Manual Summary		External Milestone			