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INTRODUCTION

In January of 2021 estimates were provided to Sound Transit (ST) Board of Directors (Board) indicating substantial increases in the cost to complete the ST3 expansion program. These increases, combined with reduced revenues because of COVID-19, could require adjustment to the original timelines for completion of ST3 unless there are alternative revenues sources.

Through a realignment process and after gaining input from the public and partner organizations, the Board will establish clear expectations about updated project delivery timelines.

To confirm affordability of the ST3 plan the Board retained a team led by Triunity Inc. with team members Ott-Sakai & Associates, Commonstreet Consulting, Capo Projects Group, and Arcadis (Assessment Team) to perform an independent review and analysis of four of the ST3 projects: West Seattle and Ballard Link Extensions (WSBLE), Tacoma Dome Link Extension (TDLE), Operations & Maintenance Facility South (OMFS) and Bus Rapid Transit (BRT) program.

The assessment was performed on the ST3 (2016), the Phase 1 (2019) and Phase 2 (2020) cost estimates.

This independent review is comprised of three tasks with a report to the Board as a deliverable for each of the tasks:

- **Task 1:** Review, analyze, and prepare an independent assessment of the cost estimate trends for specific ST3
  capital projects.
- **Task 2:** Programmatic review and analysis of the agency's cost estimating methodology used to develop the ST3 construction and real estate estimates.
- **Task 3:** Review of and recommendations for the WSBLE management methodology.

This report is the draft deliverable for **Task 3.**

AGENCY

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1.0 – EXECUTIVE SUMMARY

This report is the deliverable for Task 3 in the Cost and General Assessment reports to the Sound Transit (ST) Board of Directors (Board). The first deliverable provided a review, analysis, and preparation of an independent assessment of the cost estimate trends for specific ST3 capital projects. The second deliverable focused on the programmatic review and analysis of the agency's cost estimating methodology used to develop the ST3 construction and real estate cost estimates. This Task 3 deliverable is focused on review and recommendations for the Program management methodology and risk management for the ST3 Program and here WSBLE served as the case study.

As part of the ST3 Program, WSBLE is a large complex megaproject that is currently projected to cost more than $12 billion and scheduled to be completed in 2036. WSBLE is currently in the planning phase with the Final Environmental Impact Statement anticipated to conclude in 2023. The Assessment Team has completed an evaluation of the project management oversight structure for WSBLE with a thorough review of the project and Agency organization including current and in-process organizational changes, relevant documentation, and extensive interviews with ST staff. Our key observations and recommendations are summarized here with further commentary and explanation in the body of the report. It is intended that any recommendations resulting from our case study review of WSBLE can be applied program-wide on ST3 and to other on-going or future ST projects where feasible.

1.1 Key Takeaways and Recommendations

Our number one observation of processes ongoing before Task 1 of this contract is that the agency is actively working to improve the structure, enhance communication, streamline policies & procedures, and expedite reporting to be able to quickly provide status updates to the board. Many of our observations and recommendations apply to processes and procedures ST has already begun to implement or has been incorporating and should continue to incorporate or processes that teams will address during future phases of the projects. Without being involved with the day-to-day activities of every ongoing ST3 project, the Assessment Team can't know what of our suggestions are being implemented and can only make suggestions that should be incorporated if they are presently not being consistently being applied.

ST has an abundance of Policies and Procedures that are mature and well developed, but there is an opportunity to streamline these across the Agency to make them suitable for current business practices, the in-process agency organizational changes, and preferred project delivery approaches. This presents an opportunity for the Agency to save costs on the entire ST3 program by streamlining or eliminating unnecessary requirements that add costs in procurements. These efforts should include key focus on Operations and Value Engineering and should be led by the Portfolio Services Office (PSO).

Critical project control functions have been limited in the early phases of project development which has contributed, in part, to the recent cost estimate increases for the ST3 Program. This specifically includes risk management, value engineering, and change control. ST has strong programs for risk management and value engineering and in normal circumstances the implementation of these programs would happen after the environmental phase. However, given the complex nature of ST3 as a whole, application of these tools now will be most effective. The current program management philosophy employed originated before ST's Project Controls Team was moved into the newly formed PSO, a change which is intended, in part, to engage Project Controls earlier in project development. Thus far, this engagement has been limited and reinforcement of vision from ST leadership is needed to help streamline reporting.

The current ST organization has not been providing the necessary program level oversight functions needed for this large complex mega program. Agency leadership has taken proactive steps recently to address this gap with creation of the new PSO department. However, further reinforcement is required to effectively manage the complex ST3 program and associated projects. A Program Management Team or function must be enabled which would be responsible for complete program management for ST3, accountable to executive leadership and the Board. Senior leadership should review the present organization and determine if a new executive level Program Director

responsible for ST3 reporting at the highest levels of the organization can bring additional value. This should be done along with a team alignment process for delivery and functional groups. All recommendations for opportunities are summarized in Appendix A. In no order of precedence, the key recommendations are listed below.

Projects:

- Early selection of preferred alternative is advantageous and should be consistently applied.
- Keep scope, schedule, and budget at the forefront of planning.
- Expedite agreements with stakeholders & utilities.
- Incorporate value engineering at the planning stage.
- Incorporate risk analysis early and track as a risk matrix.
- Acquire right of way and complete utility relocation as early as possible

Portfolio Services Office (PSO):

- Definition and goals of the PSO.
- Clarify PSO and the matrix structure:
    - Reporting structure.
    - Lead annual program evaluation and dashboard reporting.
    - Support project teams:
        - Project control.
        - Risk management.
        - Value engineering.
- Policies and Procedures:
    - Review & streamline.
    - Review and restructure change management.

ST3 Program:

- Program organization structure:
    - Size of Organization and reporting relationships.
    - ST3 Deputy.
    - Project Director triangles.
    - Consultant strategy.
- Engage with contracting community.
- Formal Lessons Learned.
- Framework for annual program evaluation & dashboard reporting.

2.0 – BACKGROUND AND APPROACH

2.1 Purpose and Information Gathering

The purpose of this Task 3 assessment is to review the project management oversight structure for the WSBLE project as a case study and to make specific recommendations for improvement in oversight process and risk management, which may be applied to the entire ST3 Program and ongoing or future ST Projects. This was accomplished by conducting a thorough review of ST and program documents, organizational charts, industry practices, and a series of interviews with ST staff and project teams.

2.2 Current Policies & Procedures at Sound Transit

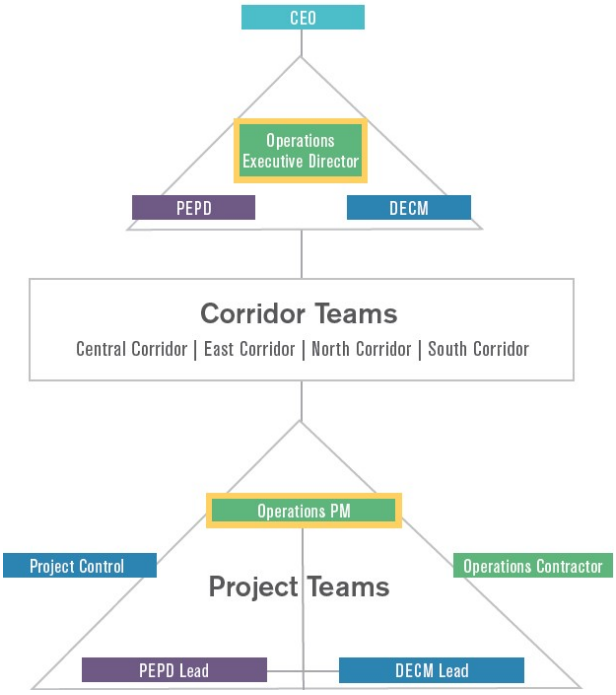
ST has a plethora of Policies & Procedures and program-wide Plans and Policies. Some of these documents are developed and utilized at the departmental levels while others are intended to function across the entire organization. The ST Program Control Policies & Procedures (PCPP) for example, were developed by the Project Controls unit and are primarily applicable to the work of Planning, Environmental & Project Development (PEPD), Design, Engineering, & Construction Management (DECM), and the newly formed PSO. Other plans, such as the ST Five-Year Agency Strategic Plan, are developed within the Executive Branch by the Chief Strategic Business Office and pertain to the entire agency. There are many such examples like this but a complete review of all Policies & Procedures and Plans and Policies was not performed as part of this Task.

The Phase Gate Program is employed by the agency to progress projects through various phases of development and milestone “gates”. The current program consists of eight (8) different gates which represent major milestones in the project development such as initiation, design, construction, operations, and others. Some gates may require Board approval to proceed or formal funding appropriation. The Phase Gate Committee is responsible for implementation of Phase Gate activities and is comprised of agency-wide representation as determined for the individual project needs by the Phase Gate program facilitator. The Phase Gate executive sponsor is the Executive Director of PSO.

2.3 Organization and Oversight Structure

The Agency and Program team organizations are robust and staffed with highly qualified professionals and subject matter experts. The team organizational chart for WSBLE is included as Appendix B. Earlier this year, ST underwent re-organization of staff to develop the new PSO department which moved oversight of critical processes of project controls, engineering, and activation from other departments and increased responsibility of delivery to the project delivery teams, including embedment of some PSO functional staff within those delivery teams. The existing departments that are most affected by this change are PEPD and DECM. Within PSO, the three prime units reporting to the PSO Executive Director are Project Controls, Engineering, and Portfolio Management & Compliance. PEPD, DECM and PSO report directly to the Deputy CEO. The PSO organizational chart is also included with Appendix B. The Board provides authority on purpose, direction, and program funding.

The WSBLE organization that was implemented in the planning phase (Phase 2) for WSBLE remains intact and was not specifically subjected to the re-organization earlier this year. Phase 2 specifically includes development of the DEIS and conceptual design work and is supported by a consultant team led by HNTB. The program delivery organization is a cross-functional team comprised of ST staff and consultants and is intended to be co-located subject to restrictions imposed by COVID-19. The Phase 2 Project Management Plan (PMP) for WSBLE is in place and serves as the prime reference for managing the current phase of WSBLE. It is intended that the PMP will be amended periodically as needed while progressing through the various phases of development.



WSBLE initially employed a project director triangle approach (hereinafter, "project director triangle") whereby the team leadership is comprised of three Project Directors representing the three functional units of Planning, Engineering and Operations. Due to the significant complexity of WSBLE, the project director triangle reports to one Executive Project Director for WSBLE who oversees the entire team. Based on ST's System Expansion Implementation Plan from December 2017 which guides ST3, it is intended that, "Leadership of the team will rotate depending on project phase, from Project Development to Design and Construction to Operations." ST is currently contemplating a pilot project for the BRT program that will employ the project director triangle along with a Program Executive that will lead the program through all phases. This is intended to establish a single source of accountability for the program through all phases and to provide consistency throughout project development.

2.4 Interviews with ST Staff and WSBLE Team

The Assessment Team conducted a series of interviews with ST staff and representatives from the ST3 program team to support this effort, interviewing more than twenty individuals from ST, including representatives from the WSBLE Consultant Team. Interviews were conducted across the agency with representatives from the Executive Team, Procurement and Contracts, PEPD, DECM, PSO, and Operations. Interviews were led by a panel from the Assessment Team and were limited to one hour each. A series of typical questions was discussed along with specific questions related to the interviewee's area of expertise. Information gathered from these interviews was instrumental in forming the basis for our observations and recommendations related to this Task. In many cases, there were common themes detected from these interviews which further help reinforce our observations and recommendations.

3.0 – OBSERVATIONS

3.1 Policies & Procedures

The Assessment Team performed a thorough review of the PCPP and found it to be robust and at or above industry standards. The PCPP consists of 22 separate procedural documents that are each updated separately, as needed, and cover a wide range of subjects relevant to Project Controls and Development including cost estimating, scheduling, change control, risk management, value engineering, and others. Some Policies & Procedures are due for an overhaul while others may require fewer amendments to align with the new organizational structure resulting from standup of the PSO department and related changes to project delivery responsibilities. Some sections of the PCPP were last updated as far back as 2010 and others have been updated as recently as 2019. Clarifications may be required such as the procedure for probabilistic cost estimating related to current industry practice and the requirements of the Federal Transit Administration's (FTA) Risk and Contingency Review Oversight Procedure (FTA OP40). Updates to the PCPP are initiated within the Project Controls unit, processed formally within the ST Change Control Board (CCB), and signed off by the Executive Directors from DECM, PEPD, and other relevant ST Director Level staff depending on the subject area.

Policies & Procedures pertaining specifically to Engineering Design and Construction Management have been previously developed and it is understood that they are subject to similar administrative procedures referred to above with respect to the PCPP. The Engineering Design criteria that were developed under DECM is now managed within the Engineering group in PSO. Specific procedures related to Construction Management remain within DECM. These Engineering Design and Construction Management Policies & Procedures were not reviewed as part of this Task, however, through interviews, it is understood that these are currently being evaluated for necessary amendments with a specific focus on project delivery methodology and opportunities for cost savings. ST Staff indicated that the agency's requirements may be excessive in nature resulting in added costs for design and construction. This presents an opportunity for refinement and potential cost savings.

ST staff has indicated that there is an overwhelming number of Policies & Procedures across the agency. Additionally, there is a lack of understanding amongst staff on how all these documents are intended to be applied or whether they are consistent with current business practices and preferred approaches for project delivery. This is not atypical for a large organization and historically ST has been very siloed, which was confirmed through the interviews. There is an opportunity for the PSO to introduce new consistency across the ST3 program with respect to these Policies & Procedures. Specifically, a team alignment process, elements of which have been initiated with the introduction of the new PSO structure, should be used to align people and processes, to help meet strategic goals and objectives, and to clarify and reinforce alignment of roles, responsibilities, communications, and working relationships.

3.2 WSBLE

3.2.1 WSBLE Program and Project Controls

WSBLE is currently not a distinct project but rather a program of related projects which may be a misperception amongst stakeholders, the Board, the public, and media. There are preliminary plans for how WSBLE will be broken up into individual segments and projects, however, re-alignment considerations for ST3 provide additional uncertainty on project delivery and schedule. ST staff has indicated that, at a minimum, WSBLE should be broken into three distinct projects.

There is no integrated schedule or baseline budget established for WSBLE. This may be established later as the projects progress through the next stages of Phase Gate and baselining. WSBLE is currently preparing to advance to Gate 2 of 8 in Phase Gate. It is anticipated that WSBLE will be phased with different delivery dates per segment, and this is contemplated with on-going program re-alignment.

ST has a comprehensive procedure for project delivery methods. Draft recommendations for delivery method selections for WSBLE have been developed by ST staff but were not made available or reviewed as part of this Task. Project delivery methods and contracting strategies have a major impact on many aspects of project implementation such as organization, staffing, processes, schedule, and, potentially, cost. As in any major program, these decisions need to be thoroughly evaluated and should consider the full complement of alternatives ranging from design-bid-build (DBB), construction manager/general contractor (CMGC), design build (DB), progressive design build (PDB) to P3. Potential carve-outs (separate contracts) for things such as systems, parking garages, etc. are also important decisions.

Project Controls on WSBLE has been limited in the early planning phases as these functions are more typically employed after project baselining has occurred (Phase Gate 4). While it is intended to bolster these functions earlier in the projects as part of the PSO mission, this transition on WSBLE has yet to be realized. WSBLE has been delayed by 12 to 24 months for various reasons according to ST staff. Reasons stated for the delay are COVID-19, delay with agency partner's reviews, and the on-going ST3 re-alignment. Major milestones for WSBLE indicated in the Partnering Agreement between ST and the City of Seattle are currently two years behind schedule.

3.2.2 Organization and Leadership on WSBLE

The approach to employ an Executive Project Director for WSBLE with a project director triangle representing DECM, PEPD, and Operations has been useful in engaging key components of planning, engineering, construction, and operations in early decision making and project development. The WSBLE team appears well staffed, well managed, and highly competent. Additional resources from Operations and the planned inclusion of PSO functional staff directly in the project teams would help improve this further. It is unclear how this leadership structure will change or be retained as WSBLE progresses through future phases of work and there is uncertainty amongst ST staff in this regard but following the previous projects that have phased from planning to engineering, the DECM representative should take the lead once the ROD has been received.

There is good cohesion and morale across the project team including the WSBLE Phase 2 Consultant Team. The direct impacts on WSBLE from COVID-19 appear to be limited as the project team continues to collaborate well remotely. Engagement levels with stakeholders are appropriate. Morale, however, across the agency beyond WSBLE appears to be notably lower and may be further compromised due to on-going program uncertainty and potential organizational adjustments.

3.2.3 Environmental Planning

WSBLE is currently a planning effort and DEIS is due to be submitted formally later this year. A single preferred alternative has not yet been developed but will later be established with the ST Board. The ST Board has the sole authority to identify a preferred alternative. This critical step is behind schedule and may contribute additional delay. The ST System Expansion Implementation Plan from 2017, Strategic Initiative 2, states the following:

> *For major projects requiring environmental review and multiple alternatives, a reasonable range of alternatives must be studied in compliance with National Environmental Policy Act and State Environmental Policy Act, and Sound Transit staff and the Board must keep an open mind about all such alternatives until the completion of environmental review. However, staff will ask the Board to identify the preferred alternative*

at the end of the alternative development process and prior to starting preparation of draft environmental documents, having considered recommendation on this topic from the Leadership and Stakeholder Groups.

Multiple alternatives have been developed within the DEIS, each with different costs and impacts. At times, these alternatives may be driven by engineering needs, transit demands, stakeholder preference, or direction from the Board. Fiscal constraint of alternatives has not been a prime factor. According to ST staff, there is an interest in getting as much scope covered in the EIS so that whatever ST can afford to build will have been through the requisite environmental clearance. This approach may have the effect of creating a bloated project that is unaffordable and sets up unrealistic expectations for the stakeholders and public. According to ST staff, there is an understanding that any costs beyond what ST provides would be borne by other stakeholders and this concept is outlined in section 1.6.2 of the initial Partnering Agreement between ST and the City of Seattle. This Partnering Agreement also contemplates scope and risk reduction measures in the event of fiscal limitations. Furthermore, "agreement on scope changes and local contributions will be memorialized in the preferred alternative concurrence document of other agreements as mutually determined by the Parties." At this time, however, it is unclear whether any of this critical work is being prioritized.

All parties should recognize that the planning phase provides the greatest opportunities for significant cost savings. Once the environmental process is complete and memorialized in a Record of Decision (ROD), opportunities for change are limited and are more technical and incremental in nature. Selection of alignment (at-grade, overhead, tunnel), grade separations, etc., are the most significant drivers of cost. To the extent feasible and acceptable to communities, the EIS process should have a major focus on the evaluation of alignment types.

3.2.4 Stakeholders

WSBLE is currently fully contained within the boundaries of the City of Seattle and, therefore, the City is the prime authority having jurisdiction (AHJ). Other stakeholders are identified in the DEIS but the prime permitting roles for construction of WSBLE resides with the City. The WSBLE team is currently working with City staff to develop a Permitting Plan which is intended to help streamline the process as the work moves further through engineering and construction. An initial Partnering Agreement between ST and the City for WSBLE was executed in January 2018 and provides a framework for how the parties intend to work together on project development.

The FTA is the prime Federal stakeholder and will be responsible for issuing the ROD at the end of the EIS process. This is necessary before the work may proceed to final design and construction. The FTA is currently engaged in reviewing the DEIS.

3.2.5 Right of Way (ROW)

The Assessment Team's observations with regards to ROW cost estimating and methodology have previously been summarized in the Task 1 and Task 2 reports. Through interviews with ST staff, we have learned that early engagement in WSBLE from members of the Real Property unit has been extremely limited and Real Property is not involved in key project decisions that may have significant impacts to ROW costs. The Real Property unit lacks adequate resources to support WSBLE and the ST3 program at a sufficient level; WSBLE management has been reluctant to engage Real Property in the early planning phases. Inadequate support from Real Property has the potential to delay the timely acquisition of Real Property on WSBLE that would likely cause further schedule delays and increase project costs. ROW cost and delay is regularly cited in projects like WSBLE as a high-risk factor in the earliest phases.

The WSBLE team is considering a plan for early acquisition of critical Real Property that is needed to implement the work and it is understood that parcels being considered for early acquisition would be required for any of the alignments currently being contemplated with the EIS. It is unclear, however, how the WSBLE team intends to pursue these early acquisitions or whether the will exists to do it. Early acquisition of ROW can mitigate risk related to schedule delay and cost escalation; however, approval from the FTA is required.

3.3 Portfolio Services Office (PSO)

The primary purpose of the PSO Group is to provide needed consistency in functional oversight of the ST3 program and its associated projects including WSBLE through Project Controls and refinement of program policies, procedures, and governance. This oversight function could serve as independent oversight of the entire portfolio of ST3 projects and beyond, in addition to supporting the Engineering and Project Controls functions at the project level as needed with staff resources. The PSO will develop standards and guidelines for all project teams including new design criteria. Enabling Project Controls to function independently from PEPD and DECM is viewed positively across the organization.

While creation of the PSO group appears well intended, the rollout has been slow thus far and does not currently provide full process oversight and reporting on consistency for WSBLE. Based on the status of WSBLE, it is unclear whether the PSO provides any significant oversight at this time and is not actively involved in key decision-making related to scope, schedule, and budget. Currently PSO is functioning primarily as a functional and staff resource group. Key resources from within PSO are not yet fully utilized by WSBLE and key positions within PSO remain unfilled. The existing structure of the PSO group may be inadequate to address needed oversight of WSBLE and the ST3 program.

Historically there has not been an annual evaluation of the complete portfolio of ST projects; however, this process is being contemplated and addressed with the pending re-alignment resolution with the Board. This is expected to improve fiscal control and decision making across the ST3 program and assist the Board in budgeting and policy decisions. It is anticipated that PSO will be directly involved in the annual program evaluation and Project Controls is specifically suitable for this effort. Annual program evaluations have proven effective at other peer agencies with related system expansion programs.

3.4 Risk Management

ST PCPP-13 Project Risk Management guides the project risk management planning and implementation at ST and WSBLE and includes consideration of qualitative and quantitative identification of risk and its related influence in probable cost outcomes. The latter is important in generating risk-based cost estimates, as are encouraged by FTA Oversight Procedure 40 (OP40) and are a standard practice for WSDOT, which requires a probabilistic risk-based cost estimate for all projects. As stated in PCPP-13:

> "*It is intended to provide a complete and consistent approach for project risk management planning as well as identify, categorizing, qualitatively assessing, prioritize, quantitatively analyzing, planning response for, allocating, monitoring, responding to, and controlling project risk through the design and construction of the project*". Furthermore, PCPP states, "*Risk management planning ensures that the level or scale, type, and visibility of risk management are commensurate with the nature and extent of a project's complexity, risk profile, and importance to the organization, the project's stakeholders, and its funding partners. Through planning, resource requirements for risk management are identified and the basis for evaluating and managing risk is defined. The risk management planning process is initiated early during project planning to*

ensure that risk management resources are available that the risk management standards can be effectively implemented."

According to these procedures, at a minimum, a quantitative risk-based cost analysis is required at the time of project baselining and may be required at the direction of the Deputy Executive Director for Project Controls. While minimum standards for risk management have been fulfilled in general for WSBLE, these efforts early in project development have been insufficient due to the high complexity of WSBLE and the lack of a probabilistic risk-based cost estimate. Many interviewees confirmed that early risk management efforts on WSBLE were insufficient, and it is unclear how risk-based costs were factored into budget estimates, consistent with the practice of other agencies, and how anticipated risk mitigation costs were considered with respect to the early cost estimates. For example, WSDOT requires a risk-based cost estimate, including base cost validation, to inform budget generally at a 50-60% probability level, depending on project size and complexity. In earlier applications 80% has been used for complex megaprojects.

The Project Controls unit has the expertise and resources available to provide sufficient project risk management and to help implement a risk-based cost estimating process. When necessary, the Project Controls team can rely upon outside consultants and subject matter experts who are highly specialized to support this work. However, there appears to be a reluctance from within the WSBLE team to engage these resources early in the process.

3.5 Change Control and Phase Gate

The Change Control Board (CCB) has historically been managed from within DECM and now resides with PSO. The CCB is due for an overhaul and there may be opportunities to streamline activities between CCB and Phase Gate to improve efficiency and decision making. The Phase Gate Program is currently managed within PSO and issues with scalability of the program have been noted by ST staff. Currently, the CCB serves primarily as an administrative authority that processes change (change orders, policy, and procedure updates, etc.). The CCB does not significantly deliberate change issues and it has been suggested within ST that the decisions have already been made on the change before it gets to CCB. The CCB does not function progressively whereby future potential changes are identified and assessed in advance.

3.6 Daylighting

According to ST staff, there has historically been a cultural problem about not wanting to deliver bad news or daylight issues in a timely manner. The daylighting issues on WSBLE have been significant and it is unclear to staff at times how, when, and where to daylight issues to agency leadership when scope, schedule, or budget change. There is a lack of an appropriate forum for communicating these issues with ST leadership on a regular basis and availability of time from leadership is limited due to other priorities or duties. This impacts crucial decision making for ST leadership and the Board. This is reinforced by the fact that there is a lack of common understanding amongst the project team and ST management on what delay, if any, exists on WSBLE and what is driving the cause of delay. The cost of the delay is also unknown.

4.0 – RECOMMENDATIONS

4.1 Policies & Procedures

ST Policies & Procedures are well developed and mature yet are due for a thorough programmatic review of agency requirements for optimization with the current environment, new organizational structure, and system requirements. Some areas require clarification, such as a process to use base cost validation and mandatory use of integrated cost and schedule modeling in PCPP-13. It is recommended that the PSO group take the lead on an effort to streamline and update all relevant agency policies and procedures related to WSBLE and the ST3 program, including Engineering Design Criteria and Construction Management procedures. The PSO has an opportunity to bring needed consistency program-wide and the PSO should be empowered to effectuate this needed change. This effort should consider all perspectives from project initiation, planning, procurement, engineering, construction, and operations with a serious focus on probable cost with value analysis, i.e., deliver the best product for the least cost that meets the intended purpose. This effort should consider all potential project delivery methods that may be employed by ST and should be scalable for application to all kinds of projects, whether they are small or mega-projects. It is recommended that Operations plays a prominent role in development of new standards related to WSBLE and the ST3 program. Solicitation of input on new policies and procedures from outside sister agencies, consultants, and contractors is recommended as they can offer a unique perspective and understanding of how ST requirements may increase project costs. Policies & Procedures should be updated in time for any future procurement related to ST3 to ensure they form the basis of project development moving forward. Where possible, policies and procedures should be streamlined or eliminated if they do not align with current business practices or provide tangible benefit to the agency.

4.2 Program and Project Controls

The Project Controls unit within PSO should be utilized on all ST3 projects to define requirements and procedures for scope, schedule, and cost management and serve a program support function, reporting up through the PSO and not the project. This should be consistent with the internal re-alignment as described in “D4G PSO Final Decision Set, October 2020” and subsequent documents and initiatives. In collaboration with the project teams, Project Controls shall serve as a single source of truth on scope, schedule, and budget that can be relied upon by ST leadership and the Board for accurate information, whether it is perceived as good or bad news.

An annual program evaluation should be conducted on the ST3 projects. This should include development of standard reporting in a dashboard format with simplified graphics that can be used to communicate status with ST leadership, the Board, and program stakeholders. Dashboard reporting should be continually maintained and updated by Project Controls or by the project team with integration and oversight by PSO. This will ensure that real time information is available at any time to aid leadership in making sound, informed decisions.

Project Team leadership and Project Controls should develop a short-term plan for implementing a thorough, focused cost validation as part of a risk-based probable cost estimate and Value Engineering approach which can be implemented between now and completion of the environmental process. Return on investment with Value Engineering has proven to be highest when utilized at the earliest phases of a project. As design continues to progress on ST3 projects, leadership and consultants should collaborate to ensure design to budget principles are prioritized. Design to budget principles should also be incorporated into updated policies and procedures, led by PSO.

4.3 Organization and Leadership

While a permanent Executive Project Director (all phases of project development) may make sense for some projects in the interest of continuity and accountability, it may not be feasible for large complex mega projects that span decades. This would require a Project Director who is empowered to make critical decisions and has a successful track record of delivering mega projects and working with a variety of large stakeholders. A combination of practical,

technical, managerial, and political expertise would be needed to guide these long-term projects through the planning, procurement, engineering, construction, and startup phases. While these capable seasoned generalists may exist, it is not reasonable to assume they are readily available for these assignments. Continuity may be achieved with a core team of project directors (triangle) that rotates throughout the project phases as currently employed at ST. Unless the individual with the resume suggest here is available, Sound Transit should continue to embrace the Project Director Triangle approach for ST3 projects and modify as appropriate on a project-by-project basis as determined by Program Leadership.

4.4 Environmental Planning (EIS)

The Board should prioritize finalizing the identification of a preferred alternative for all projects as early as conceivably possible. This will serve to establish early project budgets. To support this effort, the ST3 project teams should work closely to finalize the preferred alternative concurrence documents with stakeholders, including any agreements for third party funding or necessary scope deferral due to fiscal constraints. To improve transparency and accountability, it is recommended that a complete evaluation of project risk-based validated cost estimates be developed for each remaining ST3 project alternatives currently under consideration. In addition, a focused effort to assess opportunities for cost reductions (including alignments) while the projects are still in planning should be conducted. Participants can include members of the project team, project controls (including the value engineering group), experienced personnel working on current construction projects, and peer review members from other agencies or organizations to provide an outside perspective. This will also assist the Board in making a well-informed decision in selecting preferred alternatives and project delivery approaches.

4.5 Stakeholders

The current pursuit of a new Project Partnering Agreement with the ST3 project cities, identifying how project permitting will occur, is a positive and should continue to be prioritized by ST leadership. This should help minimize schedule delays attributable to land use and permitting review. The ST System Expansion Implementation Plan states that, “In order to provide greater clarity and predictability for local governments, ST is developing standardized agreement principles to address planning and permitting.” It is recommended that this effort be done in full collaboration with the ongoing efforts on all ST3 projects.

The ST System Expansion Implementation Plan states that:

> “*Funding for a permitting manager may be included for complex projects if Sound Transit determines that so doing would be a benefit to securing permit management services from a partner agency or jurisdiction.*”

This is encouraged to be pursued on all ST3 projects especially those with unique complexities.

Overall stakeholder interface, particularly with the cities, requires a great deal of management attention. In addition to the essential definitions of critical factors such as the permitting process defined in agreements, a focused effort to bring the cities in as more than just a permitting agency, would pay dividends. Project teams may already be doing just this with their many stakeholders, but if not, it should be addressed as soon as possible. This includes best practices such as partnering meetings including participation by senior management from both organizations, co-location, and even consideration of assigning portions of the work to the cities. If feasible, that could include parts of the work that the cities do well such as street paving, traffic signals, etc.

4.6 Right of Way (ROW)

The ST ROW unit is resource limited and needs more staff or outside expertise to support the ST3 program in the early project phases. The critical work related to identifying and acquiring the necessary real property that will be

required to implement the program is underway and property acquisition is commonly on a project's critical path. It is recommended that ST act now to ensure adequate ROW resources are in place to support timely acquisition of real property on the ST3 program.

Project Team Leadership and the ST Director of Real Property should work closely to develop an early acquisition plan (Real Estate Acquisition Plan) and deploy all available resources in pursuit of an early acquisition program. While a preferred alignment has not yet been finalized, there are common real estate parcels that have been identified on some of the projects as necessary for any of the alignments that remain under consideration. These parcels should be pursued as soon as permissible within the confines of Board Policy, FTA guidelines, and any other requirements.

4.7 Portfolio Services Office (PSO)

The development of the PSO group is a necessary step and provides great potential to introduce needed process consistency across the organization and ST3 program. The PSO is intended to serve ST and engage in program level process oversight and reporting which is currently lacking. Thus far, the PSO is serving primarily as a resource group. It is critical that the PSO group's role and mission is solidified and communicated across the agency as early as possible, and this is needed from ST executive leadership. If needed program level oversight is not provided by PSO, it is necessary that it be provided from another group, cross departmental program management team, or external Program Management Oversight function.

This planned structure of the new PSO represents a significant change in how ST manages its projects. As such, it is important to recognize the challenges of implementing significant change, particularly those related to organizational change. The new PSO must balance its role to support the project team with needed resources and expertise with its role of independently reporting project status to executive management and the Board. Therefore, it is important to clearly define the goals and processes of the PSO to the entire team. Extensive communication between the PSO and project teams is essential, beginning with executive management and the department leaders to communicate their vision for the new PSO group and how it will facilitate program success. The team alignment process, which we believe was initiated with the introduction of the PSO related changes and which is used by other Washington State Agencies and U.S. Metro programs, is recommended. Additional information on Team Alignment for Megaprojects is provided in Appendix C.

While written policies are important to define the mission, facilitated workshops with the key players to openly discuss goals, potential issues and concerns, measures of success, any overlaps in responsibilities, reporting protocols, project decision-making, etc. are also important. Ultimately, the project teams and the PSO must work together in a collaborative manner where the Project Directors are responsible for the project consistent with appropriate decision-making authority, while the PSO provides the necessary functional resources and a related oversight role. Both the PSO and project team should be in concurrence on the reporting by the PSO and project team, even when the information being reported is negative. Achieving these results may not be easy, especially at the beginning when the structure is new, but is certainly possible with the commitment of ST executive leadership and the key participants.

The Project Management Institute (PMI) defines effective program management as "a group of related projects managed in a coordinated way to obtain benefits and control not available from managing them individually". This cannot be provided by PSO based on the current organization structure or management approach, which is limited to Project Controls, Standardization, and Engineering resources. We understand that changes are in process related to delivery responsibility, functional support, and overall reporting. It is also understood that the project teams are now responsible for delivery consistent with the approved scope, schedule, and budget. A Program Management Team or Function must be enabled either within PSO or elsewhere which would be responsible for complete program management of the ST3 program and accountable to ST executive leadership and the Board. A Program Director

could be employed to lead this function to serve as a single source of accountability to the Board and executive team for the ST3 program.

4.8 Risk Management

It is recommended to reinforce risk assessment/management efforts and related risk-based probable cost and schedule analysis for ST3 projects immediately. Specifically, ST should define and implement a risk-based probable cost and schedule function with dedicated ST staff, consistent with the requirements of FTA OP40 and best practices of related agencies such as WSDOT and FHWA. This includes defining budget level consistent with such practices and the experience of related US and Canadian transit agencies.

A thorough evaluation of all current potential risks including real property, environmental, engineering, procurement, constructability, materials, and operations should be conducted, and the risk mitigation matrix should be updated. The risk mitigation matrix should specifically identify individual ST staff who will be responsible for managing the risk items through resolution along with quantifying potential cost and schedule implications. While multiple alignment alternatives remain, individual risk assessments for each alignment should be performed to inform decision making.

Each project should also develop a risk allocation matrix that summarizes risks being assumed by ST and those being assigned to other parties, particularly contractors. The well-known industry practice is that each risk should be assigned to the party best able to manage and control that risk. Past contracts and lessons learned will provide a baseline for risk allocation. However, the construction industry is changing quickly and it would be most beneficial to engage with contractors to understand their perceptions of risk and how risk allocation affects project bidding costs.

4.9 Change Control and Phase Gate

It is recommended that the PSO Executive Director and Portfolio Management & Compliance unit conduct a thorough evaluation of the current structure, purpose, and authorities of the CCB and Phase Gate Program. Where possible, these functions should be streamlined to provide optimal efficiency for the agency in development of WSBLE and the ST3 program. Where possible, limitations on change authority delegated to Project Directors on megaprojects should be evaluated for opportunities to increase thresholds to improve project management. The Change Control Process should be applied earlier in the planning phase so that changes contemplated during planning are thoroughly vetted with consideration for long term cost and schedule implications. Changes in alignment type (at-grade, overhead, tunnel) made during early planning or engineering should be subjected to formal approval from the CCB.

4.10 Daylighting

The ST3 Project teams should work collaboratively with ST leadership and the PSO on a plan to ensure issues which have the potential to affect scope and schedule or increase cost estimates are effectively communicated to ST leadership and the Board as early as possible. A regular forum or more frequent meetings should be held between project and agency leadership to improve this critical communication. At a minimum, these should occur monthly or more frequently and should be program-wide to improve cross project coordination and consistency. These meetings would allow a critical review of performance, schedule, costs, and emerging issues for every active project. PSO Project Controls should develop metrics and materials to present focusing on leading indicators for project performance.

5.0 – CONCLUDING REMARKS

ST has built a strong organization with a good track record of project delivery. The ST3 program is of a greater magnitude and level of complexity than previously experienced. As such, the program represents perhaps the largest transit expansion in the country. This program will require a strong, integrated team throughout the life of the expansion with experienced personnel in all disciplines. Organizational challenges can include staff turnover, long lead times for hiring new people for immediate needs, higher pay in the private sector, and specialized needs that do not always require full time employees. It is recommended that ST staff develop a formal best practice and lessons learned report based on previous experience with ST2 which can help guide decision making and approaches for ST3.

Currently, there is much flux in the transit construction industry that should be considered in these decisions. Particularly concerning is that many reputable contractors are treating large, complex, lump sum rail transit projects as inherently risky and are either adding high levels of contingency in their bids, deciding not to bid, or are aggressively pursuing claims. In any case, this has been a strong factor in the rising costs of rail transit projects – not just at ST.

It would be valuable to engage with contractors in effective dialogue to understand their concerns, listen to their input, and proceed accordingly. Delivery methods are not a panacea, but it is important to tailor the delivery method and contracting strategies to the specific project and risk profile. The full range of delivery methods should be considered including DBB, CMGC, DB, PDB, and P3. It may be valuable for ST to review its recommended approach with an outside peer review, which Valley Transit Authority (VTA) recently did with its latest BART extension project which is similar in size and cost to the WSBLE project.

ST should recognize and budget for programmatic needs which do not always fit nicely with projects (i.e. megaprojects in transit take a long time to design and build, plus, given their complexity, there will always be late changes that are necessary for technical compliance or to enhance the passenger experience). Also, consider “completion contracts” that have enough capacity to install such enhancements. This could alleviate pressures on baseline projects.

APPENDIX A - LIST of RECOMMENDATIONS

(to be provided with Task 3 Final Report)

APPENDIX B - ORGANIZATIONAL CHARTS for WSBLE and PSO

(to be provided with Task 3 Final Report)

APPENDIX C – WHITE PAPER

Megaproject Management & Delivery + WSDOT's CEVP Cost Estimate Validation Process

by JOHN REILLY CONSULTING

(to be provided with Task 3 Final Report)