

## Sound Transit/WSDOT Re-Alignment Issue Paper No. 3

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| <b>TOPIC:</b>               | <b>Value Engineering</b>   |
| <b>ACTION SPONSOR TEAM:</b> | Program Action Team  |
| <b>PRIMARY AUTHOR(S):</b>   | Vic Oblas, ST  |
| <b>APPLICABLE PROJECTS:</b> | All  |
| <b>DATE OF FIRST DRAFT:</b> | December 8, 2000   |
| <b>ISSUE:</b>               | At what stage of a Regional Express project that is being constructed on WSDOT right-of-way should Value Engineering study be performed. |
| <b>CURRENT STATUS:</b>      | Final Draft  |
| <b>DATE APPROVED:</b>       | January 9, 2001  |

### BACKGROUND:

The current policies for the project partners on REX projects are summarized below.

#### Sound Transit:

The Sound Move Program Management Plan, dated November 1999, commits to performing Value Engineering (VE) Studies for:

1. All public works contracts with an estimated construction cost in excess of \$10 M;
2. Each Project involving federal funding, unless otherwise agreed with the FTA;
3. An abbreviated VE analysis may be performed for projects with an estimated cost between \$5 M and \$10 M, if determined to be cost effective or in the best interests of the agency based on the project scope or for projects with unique features. (See Attachment 1, page 7-13)

At Sound Transit each of the individual lines of business are required to prepare their own component PMP that mirrors the plan for the agency. Link for instance, committed to performing VE's at the following stages:

- ?? **Conceptual Engineering** (no VE commitment)
- ?? At completion of 25% of the **Preliminary Engineering** phase
- ?? At completion of 50% of the **Final Design** phase



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Federal Highway Administration  
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Federal Transit Administration  
915 2nd Avenue, Suite 3142  
Seattle, WA 98104

The agency PMP states that Sounder and Regional Express projects may incorporate a single VE review into the design phase of their projects, depending on the size and complexity of the individual project. Sounder has completed its PMP, but the PMP for Regional Express is in process. When complete, the Regional Express PMP will be consistent with the guidelines of the agency and the requirements of FTA. (See Attachments 2 and 3 for the Link & Sounder PMPs, respectively).

It is important to note here the definition of three important terms, because they are used differently by the partner agencies. In the context of the PMPs, and hence the VE commitments, by Sound Transit terminology:

**Conceptual Engineering** is the phase of a project that results in the project definition.

**Preliminary Engineering** is the phase in which significant design issues are identified and resolved and the design details necessary to quantify the work developed. At the completion of PE, the overall design of a project is considered to be approximately 30% complete. During this phase, design consultants prepare engineering drawings supported by calculations and specifications and define the technical requirements for final design of a project. This is also included in PE/ED for Regional Express Projects.

**Final Design** is the phase of a project during which engineering and development of design documents are developed. Final dimensions, locations, and associated details are provided on signed and sealed engineering drawings.

WSDOT:

WSDOT policy requires that Value Engineering studies be conducted on complex projects, interchanges, major structures, new alignments, projects with extensive traffic control, or projects that are unusually expensive. (See Attachment 4, page 3.) WSDOT also strongly recommends that VEs be held for projects over \$2 M.

As to when a VE is performed, WSDOT identifies three potential opportunities: **Concept Stage (scoping)**, **Schematic Design Stage** and **30% Percent Development Stage**. By WSDOT definition, the three stages may be described as:

- ?? **Concept Stage (scoping):** “At this stage of development, the project scope and cost are under considerations. Preliminary engineering information should be available and the specific deficiencies or drivers should be identified.” (See Attachment 5, page 7.)
- ?? **Schematic Design:** “At the schematic design stage, the project scope and cost have been established and the major design decisions have been made. Normally, some PS& E activities have begun.....”
- ?? **30% Development Stage:** “At the thirty percent stage, most of the important project decisions have been established and the opportunity to affect the project design is somewhat limited..... In addition, constructibility, construction sequencing, staging, and traffic control elements are important to consider at this stage.”

Figure 1 attempts to graphically illustrate when VEs should be done according to the two agencies. The bold type and graphs relate to the subject of VE analysis. The VE information was overlaid onto a graphic that was originally used to compare how WSDOT and REX budget their projects. Both graphics are rough approximations, at best, but they demonstrate that the timing for VEs at both agencies is similar

in terms of the stage of completeness of the project. It is worthwhile pointing out again that at WSDOT, the timing of VEs are identified in terms of periods of “opportunity”, of which there are three. At Sound Transit, VEs are programmed to occur, if they are deemed necessary, during two distinct phases of the work. The PE/ED phase at Regional Express includes the Concept Stage of a WSDOT project. At Regional Express the PE/ED effort substitutes for a formal VE process because the work going into the identification of alternatives is the same as in a formal VE. It is also worth noting that by the WSDOT approach, the VE process breaks components of a project into functions. The VE team then identifies solutions to satisfy a function. This process utilizes what is referred to as the “80/20 Rule”, which means that 80% of a project cost can be found in 20% of the items. This essentially means that not every component of every project needs to go through a VE. By this method, a project team should look for the greatest cost savings opportunity and apply VE principles to those items.

#### FTA:

FTA requires VE on major capital projects (generally defined as projects with a total cost in excess of \$100 million), and encourages VE’s on all construction projects over \$2 million. They recommend a single VE early in the design process, before major decisions have been completely incorporated into the design, and suggest that some large or complex projects may need to conduct two VE studies. (See Attachment 8). When Value Engineering Studies are performed on a project funded by FTA, the results of the study must be reported.

FTA has stated that, for Regional Express projects, it will accept whatever criteria and processes are mutually agreed to by REX, WSDOT and FHWA as long as they are applied consistently program-wide and are consistent with the Sound Transit Program Management Plan.

#### FHWA:

FHWA has delegated responsibility for design and construction of work on Federal Highways within Washington State to WSDOT. By CFR 23 Part 627, VE studies are required on all Federal Aid (NHS) projects of \$25 M or more. While FHWA has no specific guidelines for Value Engineering studies of their own, they have indicated that they will accept whatever is agreed to by the other project partners. As with FTA, they require that the results of all Value Engineering studies be reported.

June 14 – July 12: WSDOT Bi-monthly meetings. (See Attachment 6 for Minutes),  
Sept 11, 2000: Presentation by WSDOT to Regional Express Project Managers  
Sept 12, 2000: Program Action Team Discussion. (See Attachment 7 for Minutes.)

## **RECORD OF DISCUSSION ABOUT VALUE ENGINEERING STUDIES**

### **RECOMMENDATIONS**

Based on discussions at the referenced meetings, the follow-up approach to Value Engineering Studies on Sound Transit Projects within WSDOT right-of-way has been agreed to by the project partners:

1. VE Studies will be performed on all projects over \$10 M. A “project” is defined as the full scope of work described in the Environmental Assessment.
2. For projects between \$5-\$10 M, a VE analysis may be performed if determined to be cost effective, or it is in the best interest of the project partners based on the project scope.
3. For all projects, the Project Manager for Sound Transit and the Project Manager for WSDOT will jointly decide if and when a Value Engineering Study(ies) should be performed, on which

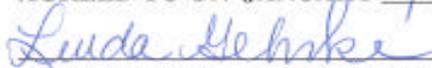
- components, and what the focus should be. If the respective managers cannot come to agreement on the need, and/or timing, the matter will be brought to the Program Action Team for guidance.
4. The identification of when to perform a Value Engineering Study(ies) should be made as early in the life of a project as possible. As a target date, a complete schedule for all known and budgeted projects should be completed and submitted to the PAT for concurrence by October 24, 2000. The Program Action Team (PAT) will take the lead in compiling the required commitments from the respective Project Managers. (Note that it is recognized that over time the issues or circumstances suggesting a need for a VE effort may change. If the respective Project Mangers from ST and WSDOT change their view as to the necessity and timing of a VE study this may be done as long as it is a joint agreement, and the schedule is appropriately updated.)
  5. No outside influence will be applied to the WSDOT or Sound Transit Project Mangers encouraging or discouraging the use of Value Engineering studies on any given project.
  6. At the conclusion of every VE study, a report will be produced and presented to FTA and FHWA, as appropriate, in a form acceptable to those agencies.
- Regional Express will complete it's component chapter of the Sound Transit Program Management Plan (PMP) by November 1, 2000, and incorporate it in it's commitment to performing Value Engineering on projects both within and outside of WSDOT right-of-way that is consistent with this issue paper, and Sound Transit policy.

**DECISION**

Adopt the recommendations described above.

**PROGRAM ACTION TEAM DECISION ON ISSUE PAPER NO. 3: Value Engineering**

AGREED TO ON JANUARY 9, 2001 BY:



Linda Gehrke, Deputy Regional Director Administrator, FTA



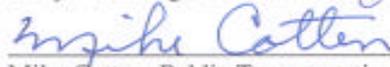
Jim Leonard, Program Manager, FHWA



Victor Oblas, Program Manager, ST



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Mike Cotten, Public Transportation Rail Engineering Manager, WSDOT



Roger Horton, Assistant State Design Engineer, WSDOT