Concept of Value on Design-Build Projects

Abstract

The application of Value Methodology (VM) to transit capital projects has been widely utilized as a strategy to reduce project costs; improve delivery time; and enhance performance during the design stage.

Recently, Sound Transit (ST) has found positive results by applying VM on Design-Build projects. The value on a Design-Build VM study can be realized at various stages during the design phase of a construction project. This paper will focus on design build project delivery and the value perceived by project team during the various phases from Conceptual to Final Design.

This paper covers the following Core competencies and Learning Objectives:

Who determines value? Accurately assess needs (Learning objective 1.2.B)
Identify Potential Value Improvement Opportunities bases on stakeholder expectations and information available (Learning objective 2.2.C)
Appraise the targeted goals, expectations, and objectives the client wants addressed (Learning objective 6.1.A)
Identify how to select a project for VM study (Learning objective 9.1.C)

About the Authors

RAHUL NAGALKAR, CVS
VE PROGRAM MANAGER
SOUND TRANSIT

Rahul Nagalkar is the past President of the Cascadia and Metropolitan New York Chapters of SAVE International, and currently serves on the SAVE International Certification Board. Rahul has been practicing Value Management for the past 17 years. His value experience has been both as a consultant and program owner.

RANDY BARBER, CVS, PE
OWNER
PROFICIO PARTNERS

Randy has been involved with the value methodology since 1997. His experience includes all types of design and construction projects, private sector clients, and group interaction issues. He has been part of more than 100 workshops, having facilitated over 50 of them. Randy has been an instrumental value engineering team leader for award-winning contracts from the State of Washington and the US Army Corps of Engineers, is a past member of the Board of Directors, and currently serves on the SAVE Certification Board.

Value definition on Design-Build projects

In a design-build (DB) environment, the concept of value has a wider variety of meanings to the various parties involved than in traditional project delivery methods. For the Operations and Maintenance Facility East (OMF East) project, the concept of value transitioned within Sound Transit (ST) as the project progressed through the various stages.

Who determines value? Accurately assess needs (Learning objective 1.2.B)

At the concept phase, the conversation between the agency and the VE consultant had one focus or need, yet at the last workshop, the need was completely different. Taking the time to discuss with the parties involved, in this case the different departments within the agency, to determine their needs. This is elemental to the success of any value workshop.

The first value engineering workshop, focused on aligning functionality to investment, was conducted at the concept level. This effort helped ST in project scope definition, cost management, and, in this case, issues associated with adjacent transit-oriented development (TOD) parcels.

Alternatives Analysis/ Conceptual Engineering

Ways the owner receives value from the initial VE work is as follows:

- Helps project managers anticipate potential Alternatives Technical Concepts (ATC's) during this early phase in design
- Anticipate/understand areas of opportunities and risks early on from SME's with construction and or/ DB background
- Informs environmental documentations (EIS and/or Supplemental EIS) to not leave out options that would preclude acceptance of a potential ATC the agency considers to be of high value
- Fosters collaboration between stakeholders (3rd parties, City partner and other permitting agencies). Doing this at the CE phase helps identify differences between ST and stakeholder requirements. The goal being giving clear and concise requirements to a DB pursuing. An example of this is the size of parking stalls. These requirements differ for all agencies including ST. The VE workshop can help build consensus for a standard stall size which all cities and ST can agree upon. This helps a DB with clear and concise requirements for building a parking garage. A pursuing DB no longer carries the risk of differing parking garage stall size requirements for each jurisdiction. To simplify the project requirements can be simple.

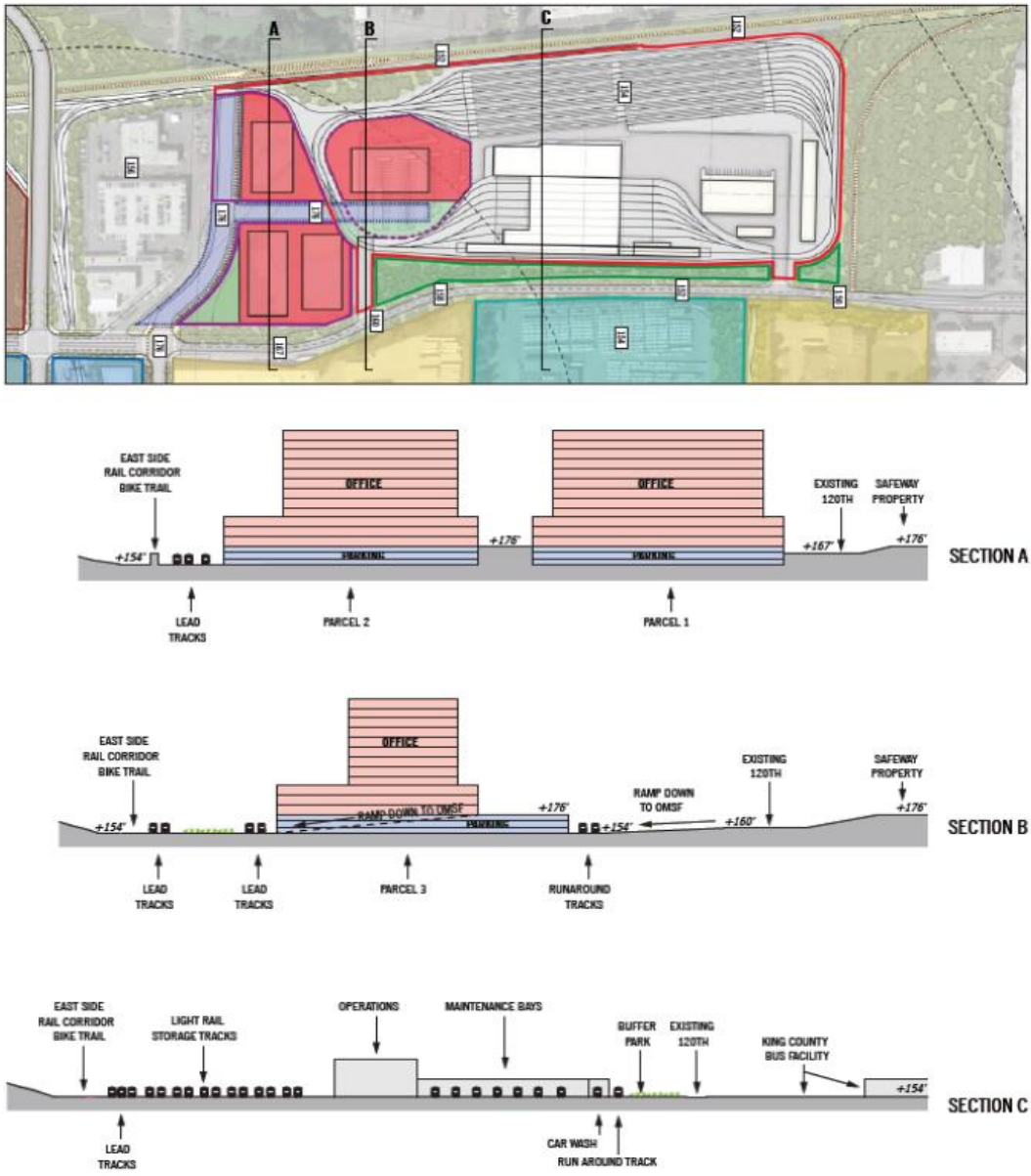

Figure 1 – OMF East Potential TOD Development Scenario

Identify Potential Value Improvement Opportunities bases on stakeholder's expectations and available information (Learning objective 2.2.C)

For ST as the owner, there was value in using this VE workshop focusing on establishing areas of focus. There was a disconnect between what stakeholders perceive they have control over on a project relative to a particular project element versus what ST believes it has jurisdiction over. For example, on the past ST projects, cites thought they could influence the shape of a column on elevated guideway including aesthetics. While ST takes into account the aesthetic concerns of a jurisdiction, it feels that the shape of the column should be simple (round in lieu of elliptical or fluted) for ease of construction (form shape, productivity, etc.) and simplifying the prescriptive requirements

Responsible	R	The person(s) or organization assigned to do the work to deliver the project.
Accountable	A	The person(s) or organization that makes the final decision and has ultimate ownership of the project.
Consulted	C	The person(s) or organization who must be consulted with before a decision or action is taken.
Informed	I	The person(s) or organization that must be informed that a decision or action has been taken.

	PROJECT STAKEHOLDERS																	
Position / Role / Project Element	City of SeaTac	City of Des Moines	City of Kent	City of Federal Way	WSDOT	Sound Transit	PSE	HWD	MSD	LWSD								
10 GUIDEWAY & TRACK ELEMENTS																		
10.01 Guideway: At-Grade Exclusive ROW	I	I	I	I	C	A												
10.04 Guideway: Aerial Structure	I	I	I	I	C	A												
10.06 Guideway: Underground Cut & Cover	I	C			C	A												
10.08 Guideway: Retained Cut or Fill	I	I	I	I	C	A												
10.09 Track: Direct Fixation						A												
10.11 Track: Ballasted						A												
10.12 Track: Special (switches, turnouts)						A												
10.13 Track: Vibration & Noise Dampening	I	I	I	I	I	A												
20 STATIONS, STOPS, TERMINALS, INTERMODAL																		
20.02 Aerial Station: Kent/Des Moines Station		I	C		I	A												
20.02 Aerial Station: Star Lake Station			C	I	I	A												
20.02 Aerial/Terminal Station: Federal Way Transit Center Station				C	I	A												
20.06 Automobile Parking Multi-Story Structure: K/DM Station		I	C		I	A												
20.06 Automobile Parking Multi-Story Structure: Star Lake Station			C	I	I	A												
20.06 Automobile Parking Multi-Story Structure: FWTC Station				C	I	A												
20.07 Elevators, Escalators: K/DM Station			I			A												
20.07 Elevators, Escalators: Star Lake Station			I			A												
20.07 Elevators, Escalators: FWTC Station				I		A												
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN BLDGS																		
30.01 Administration Building: FWTC O&M Crew Center				C		A												
40 SITEWORK & SPECIAL CONDITIONS																		

Figure 2 – RACI Matrix Results – Project Focus Areas

There was also value realized in this VE workshop with stakeholders by finalizing various interagency agreements like

- Transit Way agreement required by FTA
- Development agreement between ST and permitting agencies
- Funding agreements between ST and permitting agencies for their resources dedicated to support and permit the project

In the authors' conversations with DB contractors about on the application of value engineering on their projects, those we interviewed did not have a formal VE process as is typically defined. However, they indicated a form of VE in all of their work in order to set themselves apart from the competition. This is typically done by attempting to give the owner more – more program area, more accessibility, more this or that – for the money available.

If we look at a definition of value engineering or the application of the value methodology as a process improvement strategy to assist our clients maximize the return on their investment, this begins to take a different shape and offers new opportunities for ourselves and our clients. Many, if not most, of public projects don't think in terms of the return on investment, as essentially all private sector development projects do. If, as practitioners, we can change the dialogue, then we have the opportunity to be of service to either our owner clients or our design/construction clients. For if the goal is to maximize the return on the investment, the conversation turns from how do design/build teams give the owner more stuff for the money to one of how do they deliver the most functionality for the money. That might be in meeting basic program needs, but delivering different finishes, layouts, processes, etc. that optimize the total cost of ownership.

Proprietary meetings are an excellent opportunity for the transfer of information on what clients want and/or need. For owner clients, we can coach them in being able to describe the functional requirements

necessary for their facilities to perform. Important to note here is how we define function vs. how designers define function, a very important distinction. In a how-why type of view, the authors would say that designers deliver how an owners functional requirements are met.

On the DB team side, understanding what is important to their potential client from a functional perspective can be what differentiates them from their competition. They can offer a different approach to returning value on the investment which is consistent with the owner's real needs, not just giving owner more to take care of. This will take some education, especially for the design team on a DB project. However, the authors believe, through the contractors we interviewed for this paper, they (the contractors) understand that approach. Educating the GC on a DB team is an easier task, and as they are the lead in the DB contractual relationship, can bring their design partners on board.

A second VE workshop, conducted using the 30% Preliminary Engineering documents, identified early constructability concerns and issues, as well as provided recommendations on project definition and cost management. The concept of value up to this time, was focused on achieving the agency programmatic and functional needs within the available funds.

Appraise the targeted goals, expectations, and objectives the client wants addressed (Learning objective 6.1.A)

One can make the argument the agency's goal was to get the best value for their investment. As the control over the delivery of the design and the associated construction documents shifted to the DB contractor, the agency's definition of value changed. In this case, it morphed into a way to clearly communicate to all teams not only the hard scope of the project, but issues on coordination and expectations for operational requirements on the building to meet LEED certification goals. They realized that as ownership of design shifts, not all risk does. The question as the project moved into a DB focus was essentially how do we clearly communicate the needs and expectations to get the best set of responses.

The third VE workshop focused on a review of the draft RFP documents and the evaluation criteria. The work of the previous VE workshops had been incorporated into the bridging documents (documents provided to teams submitting proposals for the design-build competition). The value of the workshop to ST had a risk management and mitigation component (did the documents convey Sound Transit's goals, objectives, and expectations clearly) and an assessment related to communicating coordination requirements between the various Sound Transit groups and the local municipality, specifically related to the TOD issue. Additionally, the VE team reviewed the section on the evaluation of proposals, offering recommendations to Sound Transit in the areas of risk mitigation and clarifying submittal requirements. An excerpt from the function identification is show in Figure 3.

Function	Function Type
Establish Criteria	**Basic**
Convey Intent	Secondary
Define Expectations	Secondary
Support Development	Secondary
Enhance Operability	Secondary
Establish Interfaces	Secondary
Communicate References	Secondary
Maximize Flexibility	Secondary
Satisfy MOU	Secondary
Define Hierarchy	Secondary
Assign Risk	Secondary
Convey Contractual Relationships	Secondary
Establish Rules	Secondary
Encourage Competition	Secondary
Mitigate Risk	Secondary
Identify Processes	Secondary
Optimize Design	Secondary
Encourage Innovation	Secondary
Attract Talent	Secondary
Solicit Pricing	Secondary
Establish Schedule	Secondary
Define Value	Secondary
Define Scope	Secondary
Define Quality	Secondary

Figure 3 – Excerpt from Random Function Identification

A VE on the draft RFP documents by an independent team consisting of DB and construction expertise helped identify the mismatch between ST's goals and objectives and how they were communicated through the Project Requirements. The VE team can recommend that right balance between prescriptive and performance requirements.

ST also implemented the return on investment approach on the OMF East project in the development of performance criteria for building energy systems. The DB teams were made aware of requirements to demonstrate how energy systems would perform through modeling during the design effort, as well as the requirement for verification that systems will indeed perform as design and intended during operations. For ST as the owner, value for their building energy systems comes in the form of low energy consumption and maintenance costs, yet provide comfort for the building occupants. The VE team that worked on the draft RFP documents contributed to the development of the performance and verification criteria definitions.

Identify how to select a project for VM study (Learning objective 9.1.C)

Once proposals had been submitted and reviewed, the agency assembled another team to use the value engineering methodology to review the submittal documents of the apparent most qualified proponent and develop a list of questions for the agency to include in its commitment letter. The focus areas of this last effort were limited to those identified by the agency where they had questions and concerns.

Technical Proposal			ST Notes	
Vol. #	Page #	Criterion #	Topic	Commitments & Questions-for-Clarifications
1 of 2	122		Schedule	Design packages that must also be reviewed by CoB have specific language regarding contract time that must be accommodated in schedule. Confirm how this is met in HP proposal schedule.
1 of 2	5		Schedule	If the HP team is committing to having storage tracks and OMF available for use by Sound Transit in the spring of 2020, a milestone should be added to the schedule and noted in the commitments letter.
1 of 2	5, 25		Schedule	Confirm the HP proposal commitment to early access to the Interim Trail (3/29/18)
1 of 2	4, 44-46		Schedule	The HP proposal separates the OMF East site from the TOD site and offers options that enhance the TOD sites and allow the TOD site to be available earlier.

Figure 4 – Excerpt of Issues to be clarified in Commitment Letter

Defining, assigning, and mitigating risk is always somewhat tricky, and this was no exception. As the project moved from concept design through the DB submittal process, the awareness and areas of concern shifted. The agency received value from the assembled VE teams in accordance with their need at the time.

So how did the various value engineering team achieve their purpose in providing value to their common client? Following the recommendations below will benefit any VE consultant in providing value to their client.

Establish study parameters needed to address client objectives: scope of study, constraints, appropriate SMEs, stakeholder involvement, logistics. (Learning objective 6.1.B)

In all of the reviews, the agency had an eye towards getting the best value for their investment. How that was achieved differed, as did the definition of best value. Early on, the focus was on scope and cost as the definition of best value. As the delivery changed, so did the agency's definition of value. The authors believe that if you polled various groups within the agency, there is a high likelihood that you would get different definitions of value, especially in the last two reviews. In this case, it can be shown that Sound Transit had some common themes and concerns between the various workshops. Yet, the definition of the problem was different, even where the theme was consistent between the workshops (i.e. TOD)

The expertise that made up the different VE teams changed as the project progressed. The agency chose to have a few common team members for consistency purposes, but wasn't concerned about bringing in new areas of expertise to meet their specific requirements.

Lessons learned/ Conclusion

Be willing to step out and question any and all elements of the project. Bill Lenzer had a saying, "Sacred cows make the best steaks." Being willing to question everything in a respectful manner. Doing so may just lead you to a conclusion that you didn't anticipate when you began the assignment.