

EXPANDING THE USE OF THE VALUE METHODOLOGY IN EARLY TRANSIT PROJECT DEVELOPMENT

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ABSTRACT

The Value Methodology is suited to a broader range of activities than just Value Engineering of the classic project design phase. Sound Transit is in the initial phases of implementing a \$54B Capital Infrastructure Program involving the planning, design and construction of some 37 Projects. These projects range in projected budget up to \$5 Billion. Sound Transit is developing the implementation processes and procedures to best manage the implementation of the Program.

The majority of these projects will require a planning process potentially including Scoping, Alternatives Analysis, Conceptual Design and Preliminary Engineering. Application of the Value Methodology to those activities can add value. The Value Methodology can be used to address the overall project, specific project elements or issues; and/or the development processes including partnering, stakeholder consensus building; and resolving complex challenges associated with project needs vs wants. This paper explores the project development process with an eye to identifying the range of possible uses of the Value Methodology.

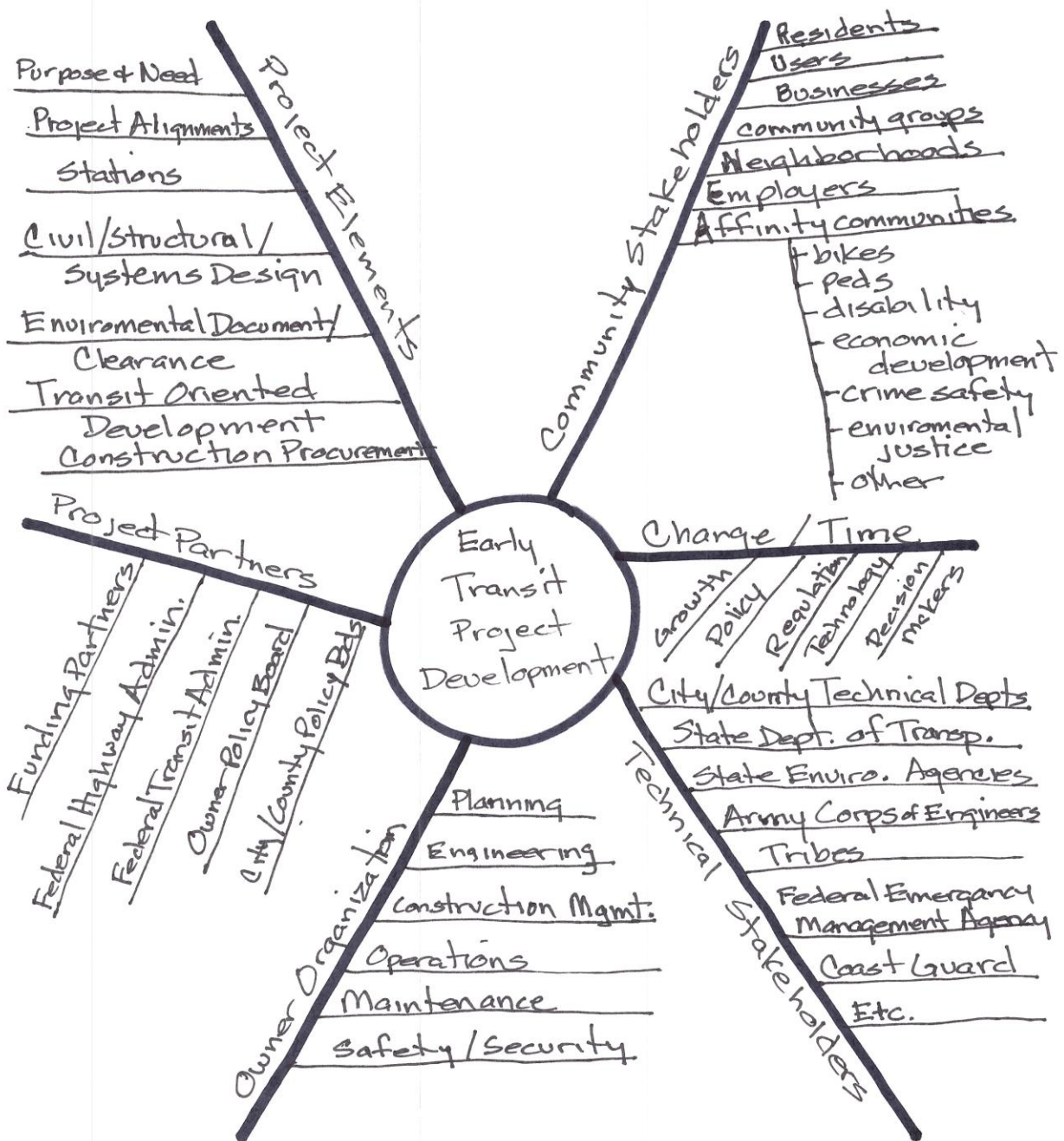
Mind Map Early Project Development

To explore the broad range of opportunities a Mind Map of the early project development activities was developed. A mind map is a diagram for representing tasks, words, concepts, or items linked to and arranged around a central concept or subject using a non-linear graphical layout that the user to build an intuitive framework around a central concept

Mind Mapping is a process that supports free form identification and arrangement of key words that define an identified subject (e.g., thing, process, concept, etc.). Intended as a 360-degree perspective, a mind map is an easy way to brainstorm thoughts organically without worrying about order and structure. It allows you to visually structure your ideas to help with analysis and recall.

The Mind Map was developed around the topic – Transit Project Development.

Figure 1 Mind Map of Early Transit Project Development



Opportunities Abound

From the Mind Map key elements were arranged into a table (Figure 2) for the identification of opportunities where the Value Methodology could be used to support the Planning Phase of the Transit Project Development Process.

Figure 2 Opportunity Table

Process Items			Value Methodology Opportunities			
Item	Sub-Item	Sub-Item Description	Scoping	Alternatives Analysis	Conceptual Design	Preliminary Engineering
PEOPLE	Community Stakeholders	Residents, users, businesses, community groups, neighborhoods, employers, special affinity communities (Bike, Pedestrian, Disability, Economic Development, Crime/Safety, Equity, etc.)	- Involvement Process Development/ Agreement			
			- Project Goals and Objectives Agreement			
			- Partnering Agreement Development			
	Technical Stakeholders	City/County Technical Department, State Departments of Transportation, State Environmental Agencies, Historic Preservation Agencies, Army Corps of Engineers, Tribes, Federal Emergency Management Agency (FEMA), Coast Guard, etc.	- Project Function Agreement			
			- Capital Cost vs Life-cycle Cost Trade-offs			
			- Alternative Development/ Evaluation		- Alternative Refinement/ Evaluation	
	Project Partners	Cities/County Policy Boards, Owner Policy Board, Federal Transit Administration (FTA), Federal Highway Administration (FHWA), other project funding agencies	- Involvement Process Development/Agreement			
			- Requirement Identification, Evaluation and Agreement			
			- Partnering Agreement Development			
	Owner Organization	Planning Department, Engineering Department, Construction Management Department, Operations and Maintenance Department, Safety and Security Department, etc.	- Technical Criteria/Function Prioritization			
			- Capital Cost vs Life-cycle Cost Trade-offs			
			- Alternative Development/ Evaluation		- Alternative Refinement/ Evaluation	
Owner Organization	Planning Department, Engineering Department, Construction Management Department, Operations and Maintenance Department, Safety and Security Department, etc.	- Involvement Process Development/Agreement				
		- Project Goals and Objectives Agreement				
		- Partnering Agreement Development				
Owner Organization	Planning Department, Engineering Department, Construction Management Department, Operations and Maintenance Department, Safety and Security Department, etc.	- Project Function Prioritization				
		- Capital Cost vs Life-cycle Cost Trade-offs				
		- Alternative Development/ Evaluation		- Alternative Development/ Evaluation		
Owner Organization	Planning Department, Engineering Department, Construction Management Department, Operations and Maintenance Department, Safety and Security Department, etc.	- Division/Department Role and Responsibility				
		- Design Review Process/Participation				
		- Partnering Agreement Development				
Owner Organization	Planning Department, Engineering Department, Construction Management Department, Operations and Maintenance Department, Safety and Security Department, etc.	- Technical Criteria/Operational Criteria/Project Function Agreement				
		- Capital Cost vs Life-cycle Cost Trade-offs				
		- Alternative Development/ Evaluation		- Alternative Development/ Evaluation		

Process Items			Value Methodology Opportunities			
Item	Sub-Item	Sub-Item Description	Scoping	Alternatives Analysis	Conceptual Design	Preliminary Engineering
PROJECT ELEMENTS	Purpose and Need (P & N)	Project Purpose and Need (P&N) is a requirement of Federal Environmental Policy and defines the problem the project is intended to address. The intent of the P&N is to ensure the project design addresses the intended purpose.	<ul style="list-style-type: none"> - Processes to be used for Project Development/Refinement - Project Function Analysis - P & N Function Analysis 			
	Project Alignment(s)	Alternative paths for the project to travel across, often reflecting tradeoffs in the achievement of project, engineering or community goals or project functions		<ul style="list-style-type: none"> - Project Function Analysis - Process for the Development of Evaluation Methodology/Criteria 	<ul style="list-style-type: none"> - Value Engineering at Project Alignment Level 	
	Stations	Alternative locations for stations, often reflecting tradeoffs in the achievement of project, engineering or community goals or project functions		<ul style="list-style-type: none"> - Component Function Analysis - Development of Component Evaluation Methodology/ Criteria 	<ul style="list-style-type: none"> - Value Engineering at the Component Level or Complex Design Element Level 	
	Civil/Structural/System Design	Projects reflect a wide range of engineering decisions made throughout the project development process		<ul style="list-style-type: none"> - Specific Issue Function Analysis 	<ul style="list-style-type: none"> - Value Engineering at the Component Level or Complex Design Element Level 	
	Environmental	Projects are required to comply with Federal National Environmental Policy Act (NEPA), State Environmental Policy Regulation, and other environmental regulation, etc.		<ul style="list-style-type: none"> - Environmental Document Function Analysis/Impact Area Identification - Specific Issue Function Analysis 	<ul style="list-style-type: none"> - Value Engineering of Environmental Impact Mitigation Alternatives 	
	Transit Oriented Development (TOD)	Transit Oriented Development (TOD) is required to be address by the FTA, as it is perceived to be a key contributor to the success of fixed route transit.		<ul style="list-style-type: none"> - Processes to be used for Development/Refinement of TOD Options 		
				<ul style="list-style-type: none"> - TOD Function Analysis 	<ul style="list-style-type: none"> - Value Engineering of TOD Alternatives (Plans or Requests for Proposals from Developers) 	
Construction Contracting Method	The project construction may be procured as Design/Bid/Build, Design-Build, CMGC, DBOM, Progressive Design-Build		Development of the process for determining the best method for the specific project			

Added Value Examples

Sound Transit has previously applied the Value Methodology to several elements of the Project Development Process including Value Engineering of rail projects at the Conceptual Design phase and the evaluation and revision of the agency Design Criteria Manual, Engineering Design Procedures, Quality Assurance Program and Design Quality Plan. The authors are using these tools to explore opportunities to expand the use of the Value Methodology at Sound Transit in the Project Development phase.

[Examples will be added to this paper as these identified opportunities are implemented this spring, and submitted to SAVE prior to the Conference.]

Conclusions

Opportunities to add value to transit infrastructure projects with the Value Methodology abound. The ability to advance these concepts will require the Sound Transit to be willing to allow these opportunities to be explored and implemented on projects.

Note to SAVE Paper Reviewers:

The authors are working with Sound Transit Planning Department to identify projects to implement some of these opportunities early in the Project Development process at Sound Transit. At the conference we would be looking to present those implementation examples.

This paper also provides the alternative of presenting the Opportunity Identification Methodology, and engaging the audience in building a Mind Map in the conference for a selected Central Topic. The authors would then engage the audience in brainstorming how the Value Methodology might be used in the elements identified in the Mind Map. Possible central topics or subjects may include, but would not be limited to:

- School Planning
- Highway Planning
- Hospital Planning, or
- A myriad of other types of projects or programs

This tool could be a strong first step across the practice to identifying additional Value Methodology use opportunities exemplifying the “No Limits to Value” theme of the conference. In addition, an interactive workshop would be interesting and fun for the participants.