Value Planning for Capital Infrastructure Projects

Six Steps to Improve Project Definition
What is Value Planning?

A systematic method to improve the "value" of projects or processes by using an examination of function. It is a primary tenet of value planning that basic functions be preserved and not be reduced as a consequence of pursuing value improvements.

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What is Value Planning?

Defined Process/Focused on Best Project
- Systematic, Thorough and Focused
- Builds on Team Dynamics
  - Independent Expertise
  - Broad Stakeholder Involvement
  - Creative Process/Ideas Build
- Clarity of Project Purpose
  - Purpose and Need
  - Performance Attributes
  - Function
  - Constraints
  - Risks
What is Value?

Framing Value

- Purpose and Need
- Goals and Objectives
- Performance Attributes
- External Requirements
- Stakeholder Desires
- Cost
- Schedule
- Constraints
- Risk Profile
- Other
When to Use Value Planning?

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Why Use Value Planning?

- Increased focus on defining and meeting goals, objectives and performance attributes
- Review of early decisions that may have prematurely limited the design options being considered
- Introduction of creative ideas early increasing the potential for their adoption
- Integration of impact mitigation into the design, streamlining environmental processes
- Improvement of capital and long-term operating costs of a project
- Improved definition of essential project components as differentiated from stakeholder preferences, providing a foundation to manage scope creep
Value Planning Application?

Project

- Project Program/Functional Definition
- Alternative Development
- Environmental Challenges
- Civil/Structural/Systems Design
- Stations, Interchanges or other Key Components
- Contracting Decisions

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Value Planning Example
Value Planning Example
Value Planning Example

Kit-of-Parts
Stations

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Value Planning Example

Parking Garage

Pond
Value Planning Example

Cast-in-Place vs Precast Construction
Value Planning Application?

Process

- Purpose and Need
- Project Goals and Objectives
- Partnering Agreements
- Financial Agreements (Capital and Life-cycle)
- Public Involvement
- Community Stakeholders
- Technical Stakeholders (Internal and External)

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## Value Planning Example

### Construction RFP Review

<table>
<thead>
<tr>
<th>No</th>
<th>Description/Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RA</strong></td>
<td><strong>Risk Allocation/Management</strong></td>
</tr>
<tr>
<td>RA-01</td>
<td>Provide for independent third-party peer review validation for prototypical data for contract proposal selection at Macarthur Park.</td>
</tr>
<tr>
<td>RA-02</td>
<td>Provide availability dates to the contractor for all properties to be acquired by Sound Transit.</td>
</tr>
<tr>
<td>RA-03</td>
<td>Allow contractors to lead negotiations for alternative street closures with the Agencies Having Jurisdiction (AHJ) with the Sound Transit rail line present.</td>
</tr>
<tr>
<td>RA-04</td>
<td>For city agreements regarding review of plans and documents, require the city assign specific staff for those reviews.</td>
</tr>
<tr>
<td>RA-05</td>
<td>Make the city responsible to pay contractor damages if they don’t provide notices within the agreement timelines (amount capped) (VIRGIN BAHIA)</td>
</tr>
<tr>
<td>RA-06</td>
<td>Require that the contractor coordinate submittal reviews by the city.</td>
</tr>
<tr>
<td>RA-07</td>
<td>Hire additional consultant staff to cover areas where Sound Transit does not have adequate staff (i.e., systems integration, systems start-up, vehicle testing, etc.)</td>
</tr>
<tr>
<td><strong>PR</strong></td>
<td><strong>Prescriptive versus Performance versus Reference</strong></td>
</tr>
<tr>
<td>PR-01</td>
<td>For task profiles, provide a horizontal/vertical tolerance for changes and require an Alternative Technical Concept (ATC) submitted to go outside of that window.</td>
</tr>
<tr>
<td>PR-02</td>
<td>Provide the specification for key elements of the system so the contractor within supplemental conditions to rework the specification with the specific equipment the contractor proposes to use to meet the specification.</td>
</tr>
<tr>
<td><strong>CS</strong></td>
<td><strong>Cost Savings Pre and Post Selection</strong></td>
</tr>
<tr>
<td>CS-01</td>
<td>Use a pre-award Best and Final Offer (BAFO) process (LA Metro)</td>
</tr>
<tr>
<td>CS-02</td>
<td>Use VA after selection per the Design Build Institute of America (DBIA) Manual of Practice (MOP)</td>
</tr>
</tbody>
</table>
Value Planning Example

Process Diagram

Define Methods
- Identify Advantages
- Identify Disadvantages

Understand Attributes

Identify Goals and Objectives

Define Process
- Define Criteria
- Apply Criteria
  - Weight Criteria
  - Evaluate Advantages
  - Evaluate Disadvantages

Document Findings

Seek Approval

Understand Context

Explore Readiness
- Identify Objectives
- Identify Requirements
- Identify Expertise
- Identify Resources

Understand Organization

Identify Goals

Understand Project

Identify Scope
- Identify Schedule
- Identify Budget
- Identify Risk
  - Evaluate Risk
  - Allocate Risk

Identify Budget

Identify Scope

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Workshop Planning

- Workshops are commonly 3 to 5 days (may be longer for extremely complex projects or when using large teams).
- Workshop planning includes identification of internal and external participants, identification of facilitator and independent experts, scheduling, contracting and related logistics.
- Ideally completed 5 to 10 weeks in advance of the workshop.
Who Participates

- Project Manager
- Project Team
- Design/Engineering Team
- Operations
- Maintenance
- Staff Users
- Funding Agencies
- Permitting Agencies
- Customer Users
- Technical Stakeholders
- Community Stakeholders
- Agency Stakeholders
- Owner Management
- Project Decision Makers

Think Inclusive!

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Independent Expertise (SME’s)

Commonly a Team of 3 to 8

- Desired/Needed Expertise
- Experienced with Project Type
- Good in a Group
- Good Listener
- Communicative
- Open Minded
- Available for Full Study
- From the Private Sector/University/Peer Agency
- Independent
Step #1 Information Stage

- Goals
- Objectives
- Purpose and Need
- Performance Attributes
- Program
- Constraints

- Schedule
- Budget
- Constraints
- Alternatives Reviewed
- Reports, Plans, etc.
- Pictures/Site Tour

And More...
Step #2 Function

What is a Function?

Active  Measurable

Verb - Noun
Function

Deliver force
Remove items
Identify manufacturer
Provide grip
Connect components
Function

- Higher Order
- Basic
- Secondary
- Assumed
- All-the-time
- Requirements/Standards
- One-time
Function
Function

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Function Exercise

Rebuild Four-way Street Intersection
Step #3 Creativity

How else could that function be provided?

Guidelines for Creativity:

- All ideas are good ideas
- Don’t evaluate the ideas in creativity
- Questions to clarify are okay
- Think broadly
- Build off others ideas
- A little crazy is good
Creativity

Brainstormed
- Connect Destinations
- Create Destinations
- Link Modes
- Support Trains

<table>
<thead>
<tr>
<th>I5CR</th>
<th>Create Destinations</th>
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<tbody>
<tr>
<td>I5CR-01</td>
<td>Move Kent-Des Moines Station west to Community College</td>
</tr>
<tr>
<td>I5CR-02</td>
<td>Use prototypical stations for the alignments</td>
</tr>
<tr>
<td>I5CR-03</td>
<td>Create a kit-of-parts for all stations</td>
</tr>
<tr>
<td>I5CR-04</td>
<td>Go under Kent Des Moines Road to Highline Community College</td>
</tr>
<tr>
<td>I5CR-05</td>
<td>Interim parking developed as shared parking with adjacent uses</td>
</tr>
<tr>
<td>I5CR-06</td>
<td>Keep Highline station east of SR99 to facilitate TOD</td>
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<table>
<thead>
<tr>
<th>I5LM</th>
<th>Link Modes</th>
</tr>
</thead>
<tbody>
<tr>
<td>I5LM-01</td>
<td>Orient Federal Way Station north-south with pedestrian mall</td>
</tr>
<tr>
<td>I5LM-02</td>
<td>Upgraded bike facilities at stations</td>
</tr>
<tr>
<td>I5LM-03</td>
<td>Break up super blocks at Federal Way Station to improve pedestrian accessibility to/from the station</td>
</tr>
<tr>
<td>I5LM-04</td>
<td>Facilitate opportunities for last mile connection shuttles, vans, etc.</td>
</tr>
<tr>
<td>I5LM-05</td>
<td>Provide for uses under the guideway that enhance the station environment</td>
</tr>
<tr>
<td>I5LM-06</td>
<td>Facilitate bus access at the stations</td>
</tr>
<tr>
<td>I5LM-07</td>
<td>Facilitate trail access at the stations</td>
</tr>
<tr>
<td>I5LM-08</td>
<td>Obtain Puget Sound Regional Council grants to facilitate station area planning early</td>
</tr>
<tr>
<td>I5LM-09</td>
<td>Provide significant parking at stations for commuters</td>
</tr>
<tr>
<td>I5LM-10</td>
<td>Provide no structured parking to allow land use flexibility</td>
</tr>
<tr>
<td>I5LM-11</td>
<td>Shared parking with adjacent uses</td>
</tr>
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</table>
Creativity
Step #4 Evaluation

What is a good idea?

**Function**

**Resources**

for

**Defined Performance Attributes**
Evaluation

Techniques

• Gut Feel
• Paired Comparison
• Nominal (Dot Voting)
• Multi-Criteria Assessment
• Risk Based Decision Making
Evaluation

7 – Excellent opportunity for improvement  
6 – Significant opportunity for improvement  
5 – Good opportunity for improvement  
4 – Minor opportunity for improvement  
3 – Minor degradation  
2 – Significant degradation  
1 – Fatal flaw  
DS – Design Suggestion (workbook prepared)

**Value Relationship**

<table>
<thead>
<tr>
<th>Value Relationship</th>
<th>Value</th>
<th>Function</th>
<th>Cost</th>
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<table>
<thead>
<tr>
<th>Rating</th>
<th>P</th>
<th>P+</th>
<th>P++</th>
<th>P++</th>
<th>P++</th>
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<tbody>
<tr>
<td>Great Opportunity</td>
<td>C--</td>
<td>C--</td>
<td>C</td>
<td>C--</td>
<td>C+</td>
</tr>
<tr>
<td>Good Opportunity</td>
<td>P-</td>
<td>P+</td>
<td>P+</td>
<td>P+</td>
<td>P++ (*)</td>
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<tr>
<td>Moderate Value</td>
<td>P-</td>
<td>P++ (*)</td>
<td>C-</td>
<td>C++</td>
<td>C++</td>
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<tr>
<td>Poor Value</td>
<td>P--</td>
<td>P--</td>
<td>P</td>
<td>P++ (*)</td>
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*Is the Function/ Performance improved to the point that it overcomes the high cost?*
Evaluation

<table>
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<tr>
<th>Ease of Construction</th>
<th>b</th>
<th>c</th>
<th>d</th>
<th>a</th>
<th>f</th>
<th>Total</th>
<th>Adjusted total</th>
<th>%</th>
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<tbody>
<tr>
<td>Ease of Mount</td>
<td>B</td>
<td>b</td>
<td>d</td>
<td>b</td>
<td>f</td>
<td>1</td>
<td>2</td>
<td>9.5</td>
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<tr>
<td>Meet Construction Schedule</td>
<td>c</td>
<td>d</td>
<td>c</td>
<td>c/f</td>
<td></td>
<td>3</td>
<td>4</td>
<td>19</td>
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<tr>
<td>Enhance safety</td>
<td>0</td>
<td>d</td>
<td>f</td>
<td></td>
<td></td>
<td>2.5</td>
<td>3.5</td>
<td>17</td>
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<tr>
<td>Provides Innovation</td>
<td>f</td>
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<td></td>
<td></td>
<td>4</td>
<td>5</td>
<td>24</td>
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<td>Permit Compliance</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
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<td>26</td>
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<td></td>
<td>15</td>
<td>21</td>
<td>100.5</td>
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Step #5 Development

Techniques

• Write-ups
• Sketches/Pictures
• Processes
• Schedules
• Decision Trees
**Value Planning Proposal CM-39**

**Workbooks**

**TITLE:** More parking garage at 116th to cool side within future T002 area

**FUNCTION:**

**Baseline Assumption**

The parking garage structure on the 116th Street site is located on the south side of S-1. The station is located on the east side of S-1. The garage will be a single story building near the station area adjacent to the future T002 area.

**Purpose:**

To provide parking for the station area adjacent to the future T002 area.

**Baseline Description:**

- **Existing:** The existing T002 area is located on the west side of S-1, adjacent to the 116th Street site. This area includes existing buildings and structures.

**Baseline Assumption:**

- The station parking garage would be located on the west side of S-1, adjacent to the 116th Street site. This area includes existing buildings and structures.

**Provisional Plan:**

- The parking garage would be located on the west side of S-1, adjacent to the 116th Street site. This area includes existing buildings and structures.

**Provisional Plan:**

- The parking garage would be located on the west side of S-1, adjacent to the 116th Street site. This area includes existing buildings and structures.

**Benefits:**

- The parking garage would provide additional space for parking near the station area.

**Cost Summary:**

- **Initial Cost:** $1,050,000
- **O&M Cost:** $300,000
- **Total Life Cycle Cost:** $1,350,000

**Data Base Assumption:**

- **Baseline:** $1,050,000
- **Provisional Plan:** $1,350,000
- **TOTAL:** $2,400,000

**Implementation Considerations:**

- Additional space would be required on the east side of S-1 to accommodate the parking garage.

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Other Tools

<table>
<thead>
<tr>
<th>Work ID</th>
<th>Description of Risk</th>
<th>Assess the Risk</th>
<th>Mitigate the Risk</th>
<th>Schedule Impact</th>
<th>Risk Register</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Poor communication</td>
<td>Low Risk</td>
<td>Low Priority</td>
<td>Minor Impact</td>
<td>Low Priority</td>
</tr>
<tr>
<td>2</td>
<td>Inadequate training</td>
<td>Medium Risk</td>
<td>Medium Priority</td>
<td>Major Impact</td>
<td>Medium Priority</td>
</tr>
<tr>
<td>3</td>
<td>Equipment failure</td>
<td>High Risk</td>
<td>High Priority</td>
<td>Critical Impact</td>
<td>High Priority</td>
</tr>
</tbody>
</table>

Tacoma Train Construction Schedule (39% TBL) Double Track

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Step #6 Presentation

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Presentation

Techniques

- Project Walk Through
- Maps/Wall Graphics/Pictures
- Modified Plans/Profiles/Sketches
- Modified Schedules
- Project Segments/Topic Areas
- Advantage Summaries
Questions
Additional Information

Ann Jamison, AICP, CVS
- Value Planning
- Value Engineering
- Risk Assessment
- Constructability Review
- Partnering

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