

# Bridge Study Working Group

October 28, 2008

## Meeting Summary

### Attendees:

**WRBAC Members** – Bob Durgan

**Consultant Team** – Miguel Rosales, Semyon Treyger, Philipp Wenger

**Technical Staff** – Kenny Asher, Teresa Boyle, Troy Doss, Joyce Felton, Brett Horner, Kaitlin Lovell, Denyse McGriff, Geraldene Moyle

**TriMet** – Rob Barnard, Steve Barrett, Sean Batty, Karl MacNair, DeeAnn Sandberg, Dave Tertadian

**Guests** – Kelly McNutt (Kiewit)

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### Meeting Goal:

Discuss individual and consultant rankings and create a first draft of the “few” bridge types.

### Key Discussion Points:

#### WRBAC Recap

- During the October 8, 2008 WRBAC meeting, the group endorsed the 600' clear horizontal clearance, endorsed the Working Group “some” bridge type recommendations, and eliminated the concrete segmental bridge type.

#### Consultant Update

- Since the Working Group last met, the consultant team and staff have been conducting analysis using ground penetrating radar and geotechnical drilling.
  - Sediment testing is being done to determine level of contamination (four borings completed in total; two on each side of the river).
- There has been a continuation of static and seismic structural analysis and some bridge type modifications have been made based on that analysis.
- The National Constructors Group continues to work on cost, risk and constructability analysis and we should have results for the November 12 meeting.

- Staff has determined gas and fiber line relocation cost estimates (minimum of \$6 million). These lines will need to be relocated if either the Tied Arch or Through Arch bridge types are selected.

### **Bridge Type Modifications**

- Wave Frame required a modification of the above deck members while still retaining the wave look. The below deck beams became a box. This modification makes it look more like a concrete segmental from underneath. The above deck members changed from “Tee” shaped members to steel boxes. The multi-use path increased to 13’ on each side of the deck.
- Through Arch deck became deeper (in some areas it changed from 10 feet thickness to about 18 feet). Arch is still in steel and the deck will be concrete. The multi-use path increased to 13’ on each side of the deck.
- Cable Stay (4 pier) became wider (around 70 feet) because of static and seismic structural analysis. The connection to the stay cables increased in size. The shadow over the water grew. The multi-use path remained 12’ on each side of the deck.
- Cable Stay (2 pier) multi-use path increased to 13’ on each side of the deck.

### **Consultant Ranked Criteria**

- Miguel Rosales and Semyon Treyger re-ranked the bridge types using all the supplemental criteria. Rob Barnard went over the results and the Working Group discussed in detail and changed rankings/clarified criteria as needed.
- Kaitlin Lovell introduced the fact that balance cut and fill in a hundred year flood plain is no longer exempt from mitigation. She made reference to a NOAA issue in the Puget Sound area. For our bridge, this refers to piers on land above ordinary high water.
- Bob Durgan indicated that all the land north of the Ross Island doesn’t meet seismic codes, so he was wondering what the project could do to the land in that area to prevent liquefaction? The team has explored several concepts but the method employed would be similar for each bridge type under consideration.

### **Screening Criteria Discussion**

- Working Group added and removed criteria to update its effectiveness at highlighting discernable differences between bridge types. Adjustments made include:
  - Refining cost escalation risk reference elements of the superstructure.
  - Adding risk criteria for foundations – geotechnical.
  - Adding risk criteria for bidding.
  - Delete constructability risk – covered in the other risk items.
  - Navigational performance was moved from the fundamental performance group to the risk group and renamed navigational permitting. The individual criteria for horizontal clearance, vertical clearance, and maneuvering remain on the list.
  - Permitting risk was revised to reference the environmental issues associated with only the in-water portion of the work.

- Added criteria for width of structure over shallow water.
- Refined number of piers criteria to read total number of piers.
- Refine transit performance to read user comfort – deflection/vibration.
- Deleted cost savings opportunity criteria – too early to assess the value engineering potential of each type.
- Deleted views of Portland – static viewpoints. The five bridges under consideration all can accommodate this function.
- Flexibility for future greenway connections was dropped. The five bridges under consideration all can accommodate this function.
- The extent/difficulty of grading at greenway for vertical clearance was dropped. This item is captured in the depth of span over greenway (vertical clearance) criteria.
- Carbon footprint criterion was deleted. Insufficient information at this level of design.
- Refined criteria description for piers in or near known contaminated media to reference in-water piers.
- A criterion was added for extent of inspections.
- Refined description for habitat enhancements on land improvements to reference the improvements at the staging yard. Some bridge types will require a large staging area.

### **Weighting Factor**

- Rob Barnard posed a question to the Working Group about whether they'd like to place weight factors to the category averages.
- The Working Group believed that the categories should be weighted.
- Various weighting scenarios were explored. The results indicated that the draft top three remain the same, only the relative order changes.
- Bob Durgan mentioned the need for as much latitude as possible in these numbers at this stage of the game.
- Miguel Rosales stated that this process has been the most comprehensive and thorough process he's ever been involved in over the years.
- The Working Group decided to weight the categories as follows:
  - 15 for cost, risk and fundamental performance
  - 10 for architecture, urban context, greenway, environmental/sustainability, bridge operations
  - 3 for miscellaneous
  - 2 for opportunities
  - For a total of 100 weighting factor point spread among the 10 categories.
- The Working Group's initial draft recommendation was that the Wave Frame, 2 pier Cable Stay and 4 pier Cable Stay bridge types are the most viable.
- The Working Group would like the record to show that this is a very preliminary recommendation. Refined analysis and data development is still in process for cost, risk and constructability. The additional information on these critical selection criteria is essential for the Working Group to validate the viability of alternatives.

- Both the Tied Arch and the Through Arch bridge types received lower scores in many of the categories. Most notable:
  - Environmental Permitting Risk (piers in shallow water)
  - Navigational Permitting Risk (horizontal and vertical clearances, maneuvering)
  - Greater depth of structural section over the Greenway trail
  - In-water pier proximity to existing subsurface utilities
  - In-water pier proximity to proposed contaminated media cap
- Bob Durgan remarked that considering the penetrations in the river and environmental feasibility, the three bridge types the Working Group has at the top of their list at this point make the most sense.

### **Next Steps**

- During the next Working Group meeting on November 12, there should be cost and risk information to discuss in detail. If one or two bridge types are no longer viable as an alternative because of the new information, staff will need to be able to explain why at the WRBAC meeting on November 13.

### **Homework:**

- Share results with stakeholders and prepare for discussion at next Working Group meeting about cost and risk.

**Next Bridge Study Working Group Meeting  
November 12, 2008 from 9am to 5pm  
TriMet, 710 NE Holladay Street, Room 1**