# Willamette River Bridge Advisory Committee Meeting

## August 8, 2008

## Meeting Notes

**WRBAC Members Present:**
Mayor Vera Katz (Chair)
Thomas Hacker, Thomas Hacker Architects Inc.
Pat LaCrosse, Oregon Museum of Science and Industry
Guenevere Millius, SRM Architecture and Marketing, Inc.
Karl Rohde, Bicycle Transportation Alliance
David Soderstrom, Portland Opera Board
Chuck Steinwandel, Ross Island Sand and Gravel
Rick Williams, BPM Development
Mike Zilis, Walker & Macy

**WRBAC Members Absent:**
David Knowles (Facilitator)
Richard Brandman, Metro
Bob Durgan, Andersen Construction
Art Johnson, KPFF Consulting Engineers
Sue Keil, Portland Department of Transportation
Mark Williams, Oregon Health & Science University
Christe White, Williams & Dame Development

**Alternates Present:**
Kathleen Cosgrove, Skyline Consulting Group (for Mark Williams)
Neil McFarlane, TriMet (for David Knowles)
Brian Newman, OHSU (for Mark Williams)
Ross Roberts, Metro (for Richard Brandman)
Paul Smith, Portland Department of Transportation (for Sue Keil)
Rick Saito, Insite LLC (for Bob Durgan)

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**Mayor Vera Katz (Chair)** welcomed everyone to the meeting. Vera pointed out that **David Knowles (Facilitator)** would not be in attendance and that **Neil McFarlane (TriMet Executive Director Capital Projects and Facilities)** would facilitate in his place. Mayor Katz noted that there will likely be bridge types presented during today's meeting that frankly will not work, but it is important to hear about those that will not work to assist in confirming those that would work. Using feedback from this meeting and future work by the consultants and the Working Group, the consultants will present +/- 6 bridge types at the September 16 WRBAC meeting.

**Neil McFarlane** directed the committee's attention to the packet of meeting materials. The Vision Statement document includes information laid out in previous WRBAC meetings. The goal is to use the listed objectives throughout the bridge type selection process. Referring to the Meeting Objectives and Work Flow document, Neil pointed out that WRBAC members may desire to attend the Working Meeting Summary Session on August 28 since there is no corresponding WRBAC meeting. At that meeting, the consultants and the Working Group will narrow the bridge types from "many" to "some." It is important to note that there are not specific numbers of bridge types at each step, but by mid-November, the list will be narrowed down to a few bridge types that are highly viable. The consultants will present those final bridge types to the WRBAC to determine if those are the appropriate finalists. From there, the process moves on through an extensive Public Comment Period.

**Pat LaCrosse**: Will the WRBAC narrow the list down to one bridge type? Is cost the main consideration in the selection process?

**Neil McFarlane**: The WRBAC should stick to the outlined process; that said, it is possible that one bridge type will emerge as the obvious choice. At no point is cost the overriding criteria, but it is seriously considered all the way through the process.

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**Miguel Rosales (Rosales + Partners Project Manager and Lead Designer)** went over the Goals and Objectives portion of the PowerPoint presentation (slides 3-13).
*The Presentation is posted on trimet.org/WRBAC for review.*

Goals and Objectives:

- Bridge should reflect Portland's unique traditions and core values (sustainable, understated).
- Provide an elegant and timeless structural expression that celebrates the river crossing and enhances the existing context/landscape (example: St. Johns bridge).
- Create a pleasant and safe experience for users crossing the river promoting connectivity to existing and future trails and greenway.
- Optimize construction cost and structural efficiency.
- Minimize bridge superstructure depth and provide an attractive bridge underside.
- Optimize constructability in the river and minimize impact to fisheries and wildlife.
- Respond to maintenance considerations and reduced lifecycle cost.
- Incorporate green design features and sustainability objectives.
- Provide compatibility with adjacent natural and built environments.
- Create a bridge of its time that reflects current technology and innovation (example: Steel Bridge, which was technologically innovative at the time it was built).

**Sean Batty (TriMet Corridor Design Manager)** presented the Baseline Screening Criteria (slides 14-20).

- Clearance Diagram (150' to 300' horizontal, 65' to 75' vertical)
- Grades (4.75% max slope)
- Section Width (66' maximum)
- Bridge High Point and Navigational Route (at different positions in the river)
- Number of In-Water Piers (4 maximum)

The screening criteria to narrow down the bridge types from "All" to "Many" are the engineering criteria, the baseline criteria and a basic budget tolerance.

**Brian Newman**: Is the bridge restricted to 66' width for the entire span?
**Sean Batty**: No, that number is representative of an average width of the bridge.

**Vera Katz**: Will that width allow for seating on the bridge?
**Sean Batty**: It will with some of the bridge types. This is just a representation of a basic assumption.

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**Neil McFarlane** invited the WRBAC to provide comments, thoughts and suggestions on the screening criteria since they serve as a guide for the entire process. **Rob Barnard (TriMet West Segment Director)** pointed out that the Vision Statement document captures all of the criteria and asked for the WRBAC to advise the staff if anything was left out.

**Mike Zilis**: It is important that bridge circulation be mixed into the urban fabric on west side. Also, the Greenway should be specifically mentioned under the Environment heading.

**Chuck Steinwandel**: The passage of vessels up and down stream is a key consideration. The alignment shown on slide 16 is not ideal for barge traffic. Public safety could be put at risk. The 300 feet listed as design criteria is pushing the horizontal clearances right to the maximum and would not be considered ideal by the maritime community. On the Clearance Diagram, as you increase the horizontal, you drop size of width. That may adversely affect maritime community.

**Sean Batty**: We realize that the 300 feet horizontal and 65 feet vertical shown is potentially problematic. We plan to talk to boat operators to find out more.

Neil proposed that Chuck's suggestion be considered as a focus of ongoing discussion as opposed to a bridge type screening criteria. Chuck agreed.

**Pat LaCrosse**: Please clarify the lines on slide 18. Is the blue line the middle point of depth? What is the depth where the red line is?

**Sean Batty**: The blue line is the assumed current navigational route for the vessels that need the most clearance. The assumption is a multi-part problem. When the water is high, the water doesn't follow the blue line, it follows the center of the river. We assume that boats are pushed in that direction, but we plan to talk to drivers of large tugs with wide tows to check on these assumptions.

**Rob Barnard** made a request of the WRBAC to email the staff if anyone thinks of any other edits for the Vision document after the meeting.

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**Semyon Treyger (HNTB Project Manager and Structural Lead)** presented the Universe of Bridge Types (slides 22-26).

- Girders: Steel I-Girder, Steel Box, Concrete Segmental Box, Wave Frame Girder, Sail Blade Girder
- Trusses and Arches: Through Truss, Tied Arch, Continuous Through Arch, Long Span Arch
- Cable Supported: Cable Stayed Extradosed, Cable Stayed Asymmetrical, Cable Stayed, Cable Stayed Hybrid Suspension, Suspension
- Movable: Swingspan Turnspans, Vertical Lift Low Level, Movable Vertical Lift

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**Miguel Rosales** presented Bridge Renderings (slides 27-90), which included renderings from multiple perspectives, size diagrams, and opportunities and challenges for each type.

- Concrete Segmental - Easily accommodates the incorporation of the overhead catenary system necessary for light rail.

- Wave Frame Girder - Provides a strong separation between the transit lanes and the pedestrian/bike areas, which can make people on both sides feel safer. The rendering shows 12 feet on each side for the pedestrian/bike area, which is generous.
  **Information provided in response to WRBAC questions**: For comparison, the pedestrian/bike area on the Hawthorne Bridge is 10.5 feet wide. The waves are not just aesthetic; they are structural and are under tension. There would not be a structural justification of making varying sizes of waves and one would not want to do so because it adds unnecessary cost. Also, with bridges, making something larger than it needs to be always ends up looking strange. The structure is narrower in the segments between the arches due to the location of the piers and the resulting tension.

- Sail Blade Girder
  **Information provided in response to WRBAC questions**: The towers go 75 feet above the bridge deck. The whole tower is150 feet high on the middle piers, about 140 feet on the two outer piers. The sails are welded plate steel. Girders are cheaper than this type, but it is in the same range as Cable Stayed. There is not a concern related

to wind shear at the highest point because the distance between the deck and the top of the pier is only about 20 feet.

- Continuous Through Arch
  **Information provided in response to WRBAC questions:** Design-wise, it is necessary for the piers closest to the land to be in the water for support. Also, the bridge deck is thicker on the parts of the bridge where there is no arch, so it would have more affect on the greenway to have the piers on land.

- Cable Stayed Extradosed
  **Information provided in response to WRBAC questions:** The bridge is larger at the point it reaches the shore. The cables do need to divide the transit and pedestrian/bike lanes because they need to have a barrier between them. It is possible to have single towers instead of pairs, which would cause the two transit lanes to be separated. It is important to note that when you have a single tower in the middle, the bridge has to be wider because of the torque issue.

- Cable Stayed - The cables are pretty transparent, not as thick as other structures – about 6" wide. This is not a type currently existing in the Portland area.
  **Information provided in response to WRBAC questions:** The Asymmetrical Cable Stayed type is usually only used when there is a specific reason, or vision, to do it. Since this is a very symmetrical alignment, it would look out of place.

- Movable Vertical Lift
  **Information provided in response to WRBAC questions:** TriMet staff is doing an analysis on what it would mean to have a movable bridge using lift data from the Hawthorne Bridge. While the high point of the other bridges is 75 feet, the high point for a movable bridge, with the lift down, would be 65 feet.

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**WRBAC General Comments/Questions**

**Vera Katz**: Are the consultants going to align the different bridge types next to each other so we can compare them visually?
**Miguel Rosales**: Yes, for the next WRBAC meeting we will show different bridge types from the same view side by side.
**Vera Katz**: Please also be prepared to mix and match the various bridge types. People are going to like one aspect of one bridge type and another aspect of another bridge type.

**Mike Zilis:** Can the bridge piers be on land?
**Sean Batty**: Currently, Miguel is focusing on aesthetics. There are implications for piers on land and piers in water, but we have not assumed piers located on or off land.
**Thomas Hacker**: What is the fundamental difference between a two pier and four pier bridge. Is the larger span automatically more expensive?
**Miguel Rosales**: Yes, the larger span is more expensive. The cost goes up exponentially with length of span because you have fewer piers in the water.

**Kathleen Cosgrove**: Within each design there are options as far as material uses, sculptural element, etc. that could be used to make it uniquely Portland, correct?
**Miguel Rosales**: We start from main structural viewpoint, then we can get down to those details. The proportion and scale of the structure are the most important. With bridges you always see the structure, unlike with buildings.
**Kathleen Cosgrove**: If we want to connect the bridge visually to the east and west sides of the river, you could incorporate elements from each side onto the bridge itself. You could take the natural landscape and bring it onto the bridge, but still maintain costs with a simpler design. I just got back from Africa where all the cable towers were disguised as trees.
**Guenevere Millius**: If we want to make the bridge "uniquely Portland," can't we accomplish that with any sound structure?
**Miguel Rosales**: What do you see as being uniquely Portland?
**Vera Katz**: We have talked previously about sculptures, benches, lights, etc…
**Pat LaCrosse**: We also mentioned waiting/rest areas. That is something we have to consider with all the bridge types because it might not work with every type.
**Miguel Rosales**: We should be able to incorporate them into any structure. No type precludes having a viewpoint.

**Thomas Hacker**: I believe scale is critical. Please show us the bridge types in relationship to nearby structures so we see how it looks in comparison to the surrounding landscape.
**Miguel Rosales**: We will superimpose them over photos later in the process.
**Thomas Hacker**: The Cable Stayed bridge type just looks so monumental. It doesn't look like a transit bridge.
**Miguel Rosales**: The bridge deck thickness will be relatively thin, so the tall towers really make a difference.
**Guenevere Millius**: However, with the new resident towers in South Waterfront, the bridge could be dwarfed if it's too short.

**Guenevere Millius**: Are the light poles restricted to 30 feet?
**Miguel Rosales**: Maintenance costs are high when the lights are positioned close to ground. There is a bridge in Germany where the lights are on the cables.
**Sean Batty**: The overhead catenary system (OCS) poles have less flexibility than light poles. It is important to know there are two kinds of poles here – each with different challenges.
**Thomas Hacker**: This raises an interesting opportunity. What if we could build a structure that incorporates the catenary wires into the structure? The poles, catenary system, and light structures could be integral to the bridge design.
**Miguel Rosales**: We definitely would like to blend all those elements.
**Vera Katz**: Is there any way of altering the light rail wires?
**Sean Batty**: Unfortunately that is not possible without a different fleet of vehicles.
**Neil McFarlane**: There are some options. In downtown Portland, for example, OCS wires will attach to buildings, so yes, they can be integrated into a structure.

**Miguel Rosales**: Pedestrians walking on the bridge will see the lighting up close. We will include those things in renderings for the next meeting. There are more options now because of LED lights because they are very efficient, sustainable, and offer more flexibility.
**Brian Newman**: Since the bridge would be lit at night, can you come back with visualizations showing the bridge at night?
**Miguel Rosales**: Yes, we will show you night views.
**Vera Katz**: The bridge needs to be lit from the beginning because otherwise it never will be lit.
**Guenevere Millius**: Could we incorporate solar panels on the landings for lighting?
**Sean Batty**: We are committed to sustainability for all aspects of the design. We will find ways to integrate the best solution. We will make a custom bridge.
**Miguel Rosales**: The cost of the lights is very small when compared to the cost of the bridge. It is the ongoing maintenance costs of lighting that is very important.

**Thomas Hacker**: There is one bridge type I have seen which is interesting to me. A French designer created a double-helix structure where the cable ties together.
**Miguel Rosales**: That bridge type is really more appropriate for a pedestrian bridge.

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**Semyon Treyger and Miguel Rosales** presented the Evaluation Criteria (slides 91-93).

**Semyon Treyger** presented the engineering considerations and explained that they will create a matrix for the next meeting that quantifies the importance of each of the considerations.

**Miguel Rosales** presented the aesthetic, urban design and function criteria.

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**Semyon Treyger** then presented the Viable Options (slides 94-103). The Working Group put each bridge type through a pass/fail process during the August 7 Working Group meeting. While everything shown today is potentially feasible, some are not beneficial. Those bridge types that the Working Group suggested to eliminate are marked with a red X.

**Rob Barnard** requested that the committee decide if the remaining list has enough types and includes all the right types. There were no objections voiced.

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**Neil McFarlane** thanked the staff and WRBAC members for the presentations and discussions. The bridge selection process has now moved from the “universe” to “many” bridge types.

Next WRBAC meeting will be September 16, 2008 from 3-5 p.m. at David Evans & Associates in the Willamette Room.