



Multnomah County is creating an earthquake-ready downtown river crossing.

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NOVEMBER 23, 2020

Community Task Force (CTF) Meeting #20

Meeting information

Project: Earthquake Ready Burnside Bridge

Subject: CTF, Meeting #20

Date: Monday, November 23, 2020

Time: 6:00 to 8:00 p.m.

Location: WebEx Video Conference Call and livestream

Attendees:

CTF Members:

Amy Rathfelder, Portland Business Alliance
Art Graves, MultCo Bike and Pedestrian Citizen Advisory Committee
Ed Wortman, Community Member
Frederick Cooper, Laurelhurst Neighborhood Emergency Team and Laurelhurst Neighborhood Association
Gabe Rahe, Burnside Skate Park
Howie Bierbaum, Portland Saturday Market
Jackie Tate, Community Member
Jane Gordon, University of Oregon
Marie Dodds, AAA or Oregon
Neil Jensen, Gresham Area Chamber of Commerce
Paul Leitman, Oregon Walks
Peter Englander, Old Town Community Association
Peter Finley Fry, Central Eastside Industrial Council
Sharon Wood Wortman, Community Member
Stella Funk Butler, Coalition of Gresham Neighborhood Associations
Susan Lindsay, Buckman Community Association
Tesia Eisenberg, Mercy Corps
William Burgel, Portland Freight Committee

Project Team Members:

Megan Neill, Multnomah County
Mike Pullen, Multnomah County
Heather Catron, HDR
Cassie Davis, HDR
Steve Drahota, HDR
Liz Stoppelmann, HDR
Michael Fitzpatrick, HDR
Jeff Heilman, Parametrix
Allison Brown, JLA
Sarah Omlor, EnviroIssues
Patrick Sweeney, PBOT

Additional Invitees:

Paddy Tillett, ZGF Architects

Apologies: Dennis Corwin, Jennifer Stein, Timothy Desper





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Summary Notes

This online virtual meeting was held over WebEx and livestreamed to the public via Vbrick. Seven public attendees logged in to view the livestream. A recording of this meeting is available on the [Committee Meeting Materials](#) page on the project website.

This summary includes the nature and dialogue of the meeting, including questions and comments submitted by CTF members through the WebEx chat function.

WELCOME, INTRODUCTIONS AND HOUSEKEEPING

Allison Brown, JLA, welcomed everyone to the meeting, went over the virtual meeting protocols and took roll call.

PUBLIC COMMENT

In advance of the meeting, the public was invited to submit comments to the CTF. No comments were received.

PROJECT UPDATE

Working Groups

Steve Drahota, HDR, and Allison reminded everyone of the Working Groups' role in the project. Steve explained that the Working Groups are evaluating content at a pace slightly ahead of the CTF so that they can provide their technical insights in time for the committee's recommendations. Allison reminded the CTF that this doesn't take away the committee's capacity to make their recommendations. She introduced Paddy Tillett, ZGF Architects, from the Urban Design and Aesthetics Working Group (UDAWG) to give an update on the group's recent discussions.

Paddy explained that the UDAWG is focused on the visual and experiential qualities of the bridge as a component of an active central city. They are exploring how to establish a cohesive concept that will connect the scale of the city on either side of the river, which differ greatly.

Paddy reviewed some of the themes that the UDAWG has been considering:

- Portland Values – The UDAWG is discussing how the bridge design can represent Portland's values without being flashy. Paddy noted that this bridge marks the center of the city and will be a significant landmark so it is important to examine how it will represent Portland.
- Characteristics of Portland – The scale of the city and the river together is very important. Paddy explained that the scale of the architecture on the east and west sides is very different and that the location of the Burnside Bridge is distinct from many of the examples they've seen that are outside of city centers. A bridge resembling a freeway ramp would overwhelm this setting.



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BETTER – SAFER – CONNECTED

NOVEMBER 23, 2020

- **Physical Connectivity** – The Burnside Bridge touches each of the four main quadrants of the city. Paddy said that, functionally, this will be three distinct bridges that will serve as a crossing for cars, bikes, and pedestrians. Elegant connections to the Eastbank Esplanade and Waterfront Park will be essential components.
- **Visual and Experiential Connectivity** – There is a contrast in the experience of approaching downtown versus traveling eastbound. The westbound travelers have a visual introduction to the river, hills, and skyline. Eastbound, the buildings are newer and varied and makes for an important differentiation. The project will need to consider the architecture on the westside with the diversity in structure size and color on the eastside.
- **Relationship to the River** - Paddy spoke of the city's relationship to the river as the centerpiece of the city but is a much narrower waterway than some of the examples that have been shared. It will be important to create a sense of transparency so as not to hide the experience of crossing the river.
- **Bridge Site and Location** – The bridge will be a central landmark for a hundred years. Paddy added that for much of the winter we experience the bridge mostly in the dark. The group is exploring how the bridge will express its landmark status at night through lighting and more.

Paddy explained the issue of the vertical (height) clearances in Waterfront Park with certain bridge types. He conveyed the importance of a sense of openness in the park. Bridge types with no columns and maximum head room would be ideal. Some alternatives would include the use of tall towers, like the cable stayed option. These column heights would be very tall in comparison with the 75-foot height limits of the historic buildings on the west side which could look quite clumsy. A through arch would move the mass of the structure away from Old Town. On the eastside, the span is about three city blocks in length and is visually relatively unrestrained by the context of the nearby buildings that are up to 250 feet tall. This allows for more freedom in bridge structures.

He also shared that vertical lift spans tend to be used on larger waterways and roadways and would be visually dominant in the center city. There is also concern about the operability of a vertical lift after an earthquake. Bascule options provide the opportunity to reduce the amount of structure above the bridge deck which would give clearer views and possibly greater seismic resiliency and less maintenance.

CTF members asked the following questions:

- William “Bill” Burgel, Portland Freight Committee, asked Paddy if he was involved in the design of the Convention Center towers and if they are too far from the Burnside Bridge to be tied into the design.
 - Paddy confirmed that his firm was a part of the design. He explained that the towers were designed to serve as a landmark and give a sense of direction. He said their context is very different from the bridge and are too far away to be relevant. Towers for



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BETTER – SAFER – CONNECTED

NOVEMBER 23, 2020

a vertical lift would be much more massive and would not be integrated into the skyline like the Convention Center towers are.

- Peter Englander, Old Town Community Association, noted the idea that Portland is going through an identity crisis and asked if that's been discussed in the Working Group. He also asked how the tradeoffs between opening up space in Waterfront Park under the bridge and unobstructed views from above deck structures are being prioritized.
 - Paddy said these are important issues and haven't been resolved yet because they are awaiting more information from the engineers on the best courses of action that balances views with open space in the park. As for the 'identity crisis,' the group has discussed the notion that the city could be losing its reputation for great urban design. He said the group is thinking about this idea as a call to awareness that there is a great opportunity to create something that adds value to Portland's infrastructure and skyline. He shared an experience from the old Columbia River Crossing project. The landscape of the Columbia and the views of the mountain made it a very precious place and a designer said the bridge has to look like God put it there. Paddy said this is what the UDAWG is aspiring for.
- Gabe Rahe, Burnside Skatepark, asked if 150 feet is the minimum required height for a cable stayed tower on the west side that was shown in the presentation.
 - Paddy said the range was 130 to 150 feet but deferred to Steve for details.
 - Steve noted those heights were reasonable, based on industry standards, and there is a tradeoff between tower heights and bridge deck depth. The shorter the towers, the thicker the bridge deck would need to be.
 - Gabe asked if lighting can be used to offset the feel of additional depth.
 - Steve noted that could be done, or other measures such as overhangs that create a softening of the bridge thickness.
 - Paddy added that this issue goes beyond lighting and into having a sense of appropriate space given the width of the bridge's cross section.
- Jane Gordon, University of Oregon, thanked Paddy for the helpful presentation.
- Stella Funk Butler, Coalition of Gresham Neighborhood Associations, asked if Paddy's presentation would be available to listen to again.
 - Megan Neill, Multnomah County, confirmed that the meeting recording would be posted on the project website: <https://multco.us/earthquake-ready-burnside-bridge/committee-meeting-materials>

MENU OF BRIDGE TYPES

Steve gave a presentation on the many different bridge types that are currently being studied by the technical team for feasibility. He reminded the committee that the bridge is being thought of as "three bridges in one" separated into the west approach span, main river movable span, and east approach



Multnomah County is creating an earthquake-ready downtown river crossing.

BETTER – SAFER – CONNECTED

NOVEMBER 23, 2020

span. He also noted that the bridge cross section will be a bit wider in the middle section to support some of the bridge superstructure and narrows down a bit at both approaches. The design team is looking at how to best integrate the three pieces together with what is technically feasible. These options generally include either through truss, cable-stayed, or tied-arch approaches and a bascule or lift movable span, although there are a few other types that the team will also consider.

Steve reviewed the steps the CTF will take to get to a Preferred Bridge Type, starting with developing criteria and measures through a process of considering project goals and objectives, stakeholder input, and agency collaboration. He said tonight’s meeting will initiate the range of feasible options discussion by reviewing what is technically feasible and what is technically challenging in the bridge design. This includes concepts around physical constraints, budget compliance, and environmental stewardship among many others.

He presented pictures of existing bridges around the world to showcase all the available bridge types and design options. He explained whether each option and feature is technically feasible or has technical challenges and why. The list of feasible types will continue to be whittled down as the evaluation process continues. More information and images of the example bridge types are available starting on slide 15 of the presentation.

Bridge Type	Technically Feasible Options	Technically “Challenged” Options or features
<i>Moveable Bridge Spans</i>		
<p>Bascule Type Key attributes of the Bascule Type including bascule span, pier locations, pier sizing, trunnion placement, and vessel collision protection are available on slide 15.</p>	<ul style="list-style-type: none"> • Traditional style <ul style="list-style-type: none"> ○ Traditional Twin-Leaf Style – This design is most similar to the existing Burnside Bridge. ○ Rustic Style – Steve showed an example of a Chicago bridge with a rustic style railing design. ○ Tower-Framed Style – An example of this option is the London tower Bridge. It’s a bascule bridge with towers on either side of the lift span for decoration. • Modern Style – Steve showed examples from Barcelona and Victoria, BC that feature above-deck tension ties and an opening eye design at the pivot point of 	<ul style="list-style-type: none"> • Single leaf bridge span – The moveable span of a new Burnside Bridge would need to be about 300 feet long which would be too long for a single span. • Split-leaf bridge span – This option would split the road into set lane configurations which would make it hard to adjust for future lane configurations and would require twice the mechanical equipment to operate.

	<p>a single bascule leaf. A single bascule leaf is also not feasible due to the horizontal navigational clearance required at Burnside. One of the challenges with this style is that it might force a split-leaf bascule. This is not an option because of the depth needed to connect with Waterfront Park. The Victoria example also includes a suspended bikeway.</p> <ul style="list-style-type: none"> • Delta Pier Style – Steve showed the Woodrow Wilson bridge in Washington D.C. as an example. The design team is currently working on how to utilize the upside-down triangle shape of a delta pier rather than the rectangles there currently are. One of the technically challenged features of a delta pier is figuring out how to avoid split-leaves on either side. 	
<p>Lift Type Key attributes of the Lift Type including lift span, pier locations, pier sizing, and sheaves placement are available on slide 23.</p>	<ul style="list-style-type: none"> • Girder Type – This option would allow the bridge to have no structures above the bridge deck but would result in a lower vertical clearance under the bridge. • Modern Truss Tower Style – This is a modern version of the truss-style lift towers Portland currently has like the Hawthorne Bridge, with an above-deck truss. The modern truss structures would be thicker and therefore more seismically stable. • Individual Tower Style (Single Tower or Split Tower) – The project team is also considering individual and split tower styles. Individual towers would have a single tower at each of the four corners of the lift. Steve noted that each of these towers would be quite large at 	<ul style="list-style-type: none"> • Slender Steel Truss – The Hawthorne and Steel Bridges are examples of this style and they are not expected to be seismically stable.

	<p>about 30-40 feet wide. It’s also an option to rotate the sheaves to face the roadway for added design options. The split towers would have two smaller towers at each of the four corners and would have lower impacts on views. Structurally, a split tower is slightly more favorable, but single towers might be preferable for design purposes. These two options will continue to be studied.</p>	
<p>Other Movable Bridge Types Deemed Technically Challenged</p>		<ul style="list-style-type: none"> • Unrestrained cable lifting mechanisms – The examples of this bridge aren’t located in seismic zones and therefore are untested for seismic stability. • Swing Bridge – This style would be impractical for this location because in order to open, a larger river area would need to be cleared of boats. It’s generally quite costly and slow to open as well. • Twin Sail Bridge – The example is only 77 feet long and is impractical for the 300-foot opening span of the Burnside Bridge.
<p>Fixed Approach Bridge Types</p>		
<p>Tied Arch Option Sketches of the various tied arch combinations with either bascule or lift movable options are available on slide 36.</p>	<ul style="list-style-type: none"> • Conventional Style – This style of bridge performs well in a seismic event and has some height variability. The approximate height on the west side would be about 85 feet and 120 feet on the east side. <ul style="list-style-type: none"> ○ Network Cable – This subset includes diagonal cables to provide stiffness. An example of this type is the Sauvie Island Bridge. It features two arches 	<ul style="list-style-type: none"> • Single Rib Alignment – This option would have one arch in the center of the roadway. This would make the bridge deck much deeper and would split the bridge down the middle and limit future lane reconfigurations. It would also be difficult to construct over the highway and railroad.

	<p>that are connected with cross bracing on the top.</p> <ul style="list-style-type: none"> ○ Open Rib – This is similar to the network cable except that it doesn’t require cross bracing between the ribs on either side of the roadway. This is accomplished with much thicker ribs. ● Inclined and Cable Stiffened Style – Steve showed an example from China that includes asymmetrical arches on either side of the roadway that use additional cables to avoid cross bracing. 	
<p>Truss Option Sketches of the various truss combinations with either bascule or lift movable options are available on slide 42.</p>	<ul style="list-style-type: none"> ● Conventional Style – Steve noted that truss bridges require more material than tied arch and will always require a “truss roof” of cross-framed beams. He showed examples of bridges in Florida and New York. He noted this is a similar style to the Hawthorne Bridge with thicker trusses. Maintenance for truss structures can be very expensive. 	<ul style="list-style-type: none"> ● Circular Style – This style features a cylindrical instead of rectangular structure around the deck and is generally used for smaller pedestrian bridges. It would be very expensive to build to the size needed for the Burnside Bridge and is unproven for seismic resiliency. ● Deck Truss Styles – This style is similar to the current bridge. This option would not allow for sufficient vertical clearances for the long spans below the deck.
<p>Cable Stayed Option Sketches of the various cable stayed combinations with either bascule or lift movable options are available on slide 46.</p>	<ul style="list-style-type: none"> ● Conventional “goal post” Style – Steve showed examples of this common bridge style and noted it is cost effective and reliable in a seismic event but would require tall supports that would impact views on either side of the river. An additional consideration is that a tower would need to be located in Waterfront Park. ● There are many tower shapes and cable arrangements that are feasible. 	<ul style="list-style-type: none"> ● Single Tower - This option would have one tower bifurcating the roadway of the bridge. This would split the bridge down the middle and limit future lane reconfigurations and would be difficult to construct over the highway and railroad. This option also requires a deeper superstructure resulting in insufficient clearances over Naito Parkway.

	<p>Some of these decisions within the cable stayed option could be deferred to final design.</p>	
<p>Extradosed Option Sketches of the various extradosed combinations with either bascule or lift movable options are available on slide 50.</p>	<ul style="list-style-type: none"> • Conventional “goalpost” Style – Extradosed styles are similar to the cable-stayed option with shorter support towers above, but larger foundations and a much thicker deck to compensate for the lower tower height. 	

Steve also shared some of the other bridge types that the team considered, but were deemed Technically Challenged:

- Suspension (Anchored Type) – This style wouldn’t make very much sense when considering the site context and scale. They require large “anchorage houses” or supports on each approach and are typically used for much longer spans.
- Suspension (Self-anchored) – An example is the San Francisco Bay Bridge. This style requires that the entire bridge be supported by falsework during construction and is very expensive.
- “Other” types including Wave Frame and Sail Blade Girder Types – These structures can be very beautiful but are seismically unproven and would also be expensive to fabricate, construct, and maintain.

CTF members asked the following questions:

- Art Graves asked if any of these designs are specific responses to something or if they are unique and random design solutions.
 - Steve said they are all in response to a particular design question or tradeoff. For instance, the split versus single tower style in the lift option are meant to limit load distribution and keep bike and pedestrian viewpoints open as much as possible. All options are in response to some sort of tradeoff. Some variables will matter a lot in the bridge type selection, and some are more useful when considering context for final design.



Multnomah County is creating an earthquake-ready downtown river crossing.

BETTER – SAFER – CONNECTED

NOVEMBER 23, 2020

- Art asked a follow up question about whether any of the bridge types presented resemble other bridges in Portland.
 - Steve answered that they are all composites of different types of features and examples – some in Portland and some from other areas.
- Susan Lindsay, Buckman Community Association, asked for clarification on the split tower style. She noted that the option seems to impede views more.
 - Steve explained that the width of a single tower would be at least twice as wide as the split towers. A wider tower would obstruct more views for pedestrians and bicyclists than the slimmer split towers. This difference will become more apparent when additional renderings are completed. The engineering reason that the technical team is leaning towards the split option is because the connection points of the ropes to the bridge make for a more structurally effective system.
- Susan asked if there was a workaround for the lower clearances over Naito Parkway to make the extradosed option more feasible.
 - Steve said Naito Parkway needs 18 or 19 feet of vertical clearance and the current concepts for the extradosed option would be too thick. To meet this requirement, the cable towers would need to be taller which could defeat the purpose of the extradosed option. The team is continuing to explore different options.
- Tesia Eisenberg, Mercy Corps, asked if there is a range of how seismically sound each option is or if they are all on a similar level.
 - Steve said all of the feasible types, including the movable span, can be designed for the same level of seismic stability and resiliency. The difference is the cost and size of some of the features in order to reach that level of seismic stability.
- Frederick “Fred” Cooper, Laurelhurst Neighborhood Emergency Team and Laurelhurst Neighborhood Association, asked if the extradosed option is possible for the east side approach or if there are vertical clearance issues on that side as well.
 - Steve said it depends how it’s built. He said there might be a problem near the I-84 ramps. The question is if construction will require a thicker deck plus falsework and what ODOT will allow as a temporary vertical clearance during construction. The heavier structure also requires larger foundations which is another challenge for the extradosed.
- Neil Jensen, Gresham Area Chamber of Commerce, asked if a lift truss bridge with independent towers would inherently be riskier than a bascule because of swaying during an earthquake.
 - Steve said any lift bridge with a tall tower would have its counterweights low in the bridge to counterbalance swaying that would occur in an earthquake. This is part of the reason that the lift span towers for the truss would have to be much thicker than the existing truss bridges we have. The existing truss bridges’ structures are perfectly designed for the vertical load but are not intended to withstand the large lateral load of an earthquake.



Multnomah County is creating an earthquake-ready downtown river crossing.

BETTER – SAFER – CONNECTED

NOVEMBER 23, 2020

- Neil asked how much the top of a 40-foot tower would move in an earthquake.
- Steve said he didn't have an immediate answer available but each one of the support bases would have an array of about 18 different shafts, each 12 feet in diameter. Each one of the towers is sized to control deflection as much as possible.
- Neil shared his excitement for the many available options and hoped they would produce a good end result.
 - Megan agreed.
 - Mike Pullen, Multnomah County, agreed and joked that the CTF members deserved a diploma after completing tonight's presentation.
 - Steve added that the UDAWG was considering even more bridge options than he had thought and was looking forward to bringing some of those options to the CTF.
- Stella asked if the fixed bridge was back on the table after it was removed in 2019.
 - Steve clarified that the fixed bridge is different from a high fixed bridge, which was dismissed previously due to its extreme height and length. The fixed bridge options presented in this meeting correspond to the fixed spans on the west and east sides with a movable span in between.

EVALUATION CRITERIA DEVELOPMENT

Jeff Heilman, Parametrix, reminded the committee of the evaluation process to get to a recommended bridge type and noted that the group is currently in the midst of identifying evaluation criteria per topic. A process graphic is available on slide 60. The process is very similar to that used to get to a Preferred Bridge Alternative. There are several sources that will contribute to the evaluation criteria, including information from the previous NEPA phase criteria that are more relevant now as well as input from the CTF breakout groups and working groups.

Jeff showed the group the draft evaluation topics and criteria that the project team has put together and explained that he wouldn't review all of the details in the presentation tonight. Instead, he asked the CTF to review the topics, criteria, and the levels of differentiation they would have between bridge types before the next meeting on December 7.

NEXT STEPS

Allison and Steve shared the schedule for upcoming CTF meetings and agenda topics.

- December 7: Measures per evaluation criteria and range of feasible bridge types
- December 21: Finalize criteria and measures and range of feasible bridge types

The December 21, 2020 meeting will be a major milestone. The criteria and range of feasible bridge types that come out of that meeting will be shared with the public and the Policy Group in early 2021.

OPEN DISCUSSION





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BETTER – SAFER – CONNECTED

NOVEMBER 23, 2020

- Mike thanked everyone for getting through a very dense conversation.
 - Susan thanked Steve and Paddy for presenting.
 - Bill Burgel and Marie Dodds, AAA of Oregon, thanked Steve for the great job.

ADJOURN

Allison closed out the meeting and wished everyone a safe holiday.

The next CTF meeting will be December 7, 2020.

ACTION ITEMS

- **Action 1:** Megan Neill will share the project website link to access the meeting recording.
- **Action 2:** CTF members will review the draft evaluation criteria before the next meeting on December 7.