EARTHQUAKE READY BURNSIDE BRIDGE

Multnomah County is creating an earthquake ready downtown river crossing.

BETTER – SAFER – CONNECTED

September 2020

Urban Design and Aesthetics Working Group (UDAWG)

Charter and Group Protocols

PREAMBLE

Multnomah County is conducting a project to provide our community with a reliable Willamette River crossing on the Burnside regional lifeline route after a major earthquake. An Urban Design and Aesthetics Working Group (UDAWG) will serve as an advisory body to Multnomah County (the County) to inform the Community Task Force's (CTF) recommendation of a bridge type to move forward into the final design phase.

PURPOSE OF CHARTER

This Charter and Group Protocols document (the Charter) will guide the operation of the Earthquake Ready Burnside Bridge UDAWG. This charter is intended to provide a clear definition of the UDAWG and the roles and responsibilities of the UDAWG members, the group facilitator, County staff, the consultant team and any invited guests. It also identifies the way in which the UDAWG will operate, including decision-making processes, meeting conduct and communication. Once agreed upon by the UDAWG, the charter will guide the work and conduct of the UDAWG in an open and transparent way.

PURPOSE OF THE URBAN DESIGN AND AESTHETICS WORKING GROUP

The purpose of the UDAWG is to serve as a technical resource body to the CTF for urban design and aesthetics by:

- Providing informed insights and opinions on the visual features for each type selection option
- Recommending measures to enhance aesthetic opportunities or mitigate potential visual impacts
- Representing urban design and aesthetic interests
- Reflecting the character of Portland by suggesting place-making opportunities

OUTCOMES OF THE GROUP

The outcomes for the UDAWG group are to:

- Inform a set of feasible bridge type options for the CTF's consideration
- Inform a project-specific Visual Performance Standard for use during the Type Selection and Final Design phases
- Recommend visual and aesthetic evaluation criteria for consideration by the CTF

MEMBERSHIP AND REVIEW

TERM:

UDAWG will begin work for the bridge type selection phase in September 2020 and continue through to an estimated completion date for the group's work in May 2021.

MEMBERSHIP:

The UDAWG is not a statistically valid or representative sample of the County population. Instead, the UDAWG endeavors to bring together members who represent a range of community interests. A list of the membership and represented organizations is attached to this Charter. Outside of the UDAWG, members' personal contact information is considered private information and should not be disclosed to the public unless group permission has been provided to do so. To contact a UDAWG member please email: burnsidebridge@multco.us and your correspondence will be provided to the UDAWG member.

UDAWG members will be asked to approve the sharing of individual member contact information with fellow UDAWG members for the sole purpose of enabling communication among members. Members are asked to CC the facilitator for record keeping purposes.

MEMBER PARTICIPATION:

Meetings will be scheduled in advance and attendance is important. Members will make their best effort to attend all meetings. Members will notify the facilitator or designated staff in advance if unable to attend and can provide written comments or vote prior to the meeting. Alternates are not allowed to participate in the discussion but are welcome to observe UDAWG meetings. Non-attendance for three or more meetings may result in relinquishing membership on the UDAWG.

Should a member need to resign their membership from the group, they should do so by informing the UDAWG facilitator in writing. At this time the County may decide to fill the vacancy by way of expression of interest or other mechanism.

Should a member be deemed to no longer represent their organization (through change in position or other circumstance) the County reserves the right to revisit the UDAWG membership to ensure the UDAWG maintains organizational representativeness.

UDAWG OPERATION AND PROCESS

MEETING FREQUENCY AND LOCATION:

For the bridge type selection phase, meetings will be held during the weekday, approximately 1-2 times per month, between the months of September 2020 and May 2021, and will typically be two-hours long in duration. Meetings will be hosted online through WebEx. Depending on the agenda and progress of meetings, a longer meeting or additional meeting may be required. Conversely, scheduled meetings may be cancelled.

MEETING AGENDA AND MATERIALS:

The meeting agenda will be provided to group members in advance of the meeting. From time to time, background materials may be included with the agenda for pre-reading and meeting preparation. From time to time, subject matter experts or guest speakers may be asked to present to the group.

Every effort will be made to ensure meeting materials are finalized at the time of electronic distribution to UDAWG members. However, there may be instances where updated versions of materials or additional materials are provided during the meeting.

The facilitator and supporting staff will be available at and between meetings to address questions, concerns and ideas. The facilitator and staff will respond to all member inquiries in a timely manner. The facilitator may contact UDAWG members between meetings to address any potential areas of concern or conflict that may arise during the UDAWG's work.

MEETING SUMMARIES:

Preparation of meeting summaries will be performed by Multnomah County's project team and its consultants.

MEETING PROTOCOLS:

Meetings will be actively facilitated to ensure that discussions are consistent with the Charter and to ensure that discussion, feedback and recommendations are advanced from the group in a timely manner.

From time to time, the County may ask for two UDAWG participants to act as Co-Ambassadors and serve as representatives at other meetings or act as a liaison to other groups or organizations. Ambassador roles will be rotational and different Ambassadors may be appointed depending on the subject matter.

The facilitator will be a 'content neutral' party who ensures that all UDAWG members have an equal opportunity to participate. The group's facilitator, UDAWG Members, project team members, consultants and invited guests agree to follow the meeting ground rules, including:

- Be curious and willing to learn and contribute.
- Ask questions of each other to gain clarity and understanding.
- Express yourself in terms of your preferences, interests and outcomes you wish to achieve.
- Listen respectfully, support each other and try to understand the needs and interests of others.
- Respect timelines by being concise and brief with comments and questions.
- Focus on the agreed scope of the discussion.
- Attend all meetings in a timely manner.
- Respect the role of the facilitator to guide the group process.
- Seek common ground.

Members agree to give the facilitator permission to keep the group on track and table discussions as needed to keep the group moving.

DECISION MAKING

WORKING TOWARDS CONSENSUS:

UDAWG members will be asked to actively participate in consensus building processes. All members are encouraged to challenge themselves and each other to think creatively and to approach the project with an open mind. While it is important to identify problems, it is even more important to seek thoughtful solutions that advance the conversation.

The group will endeavor to work towards consensus at key milestones. Opinions will be documented, recorded and included in any UDAWG recommendations.

Disagreement and differences of opinion should be acknowledged, explored, understood and appreciated. Should conflict arise, it should be addressed with the guidance of the facilitator. Any inappropriate conduct may result in permanent expulsion from the group.

FORMAL SPOKESPERSON:

The media spokesperson for this project is Mike Pullen, County Communications Office, who may be contacted at 503-209-4111 or mike.j.pullen@multco.us.

UDAWG members may not speak to the media *on behalf of the* UDAWG, unless consent has been provided in writing from the County and agreed to by the UDAWG membership. UDAWG members may speak to the media on their own behalf.

PHOTOGRAPHY, RECORDING AND SOCIAL MEDIA:

Members are asked to silence mobile phones and electronic devices and refrain from live recording, personal live streaming or other use of social media during the UDAWG meeting sessions to allow members to focus on the discussion.

Due to the restrictions of meeting in-person that came in early 2020 with the COVID-19 pandemic, meetings will be held online.

From time to time, photography or video recording may be used to capture meeting activities, outcomes and process; however, any members may choose to abstain from appearing in any photographs. Activities and outcomes of the group process may be recorded and utilized on various media and social media channels for marketing and reporting processes. The group will be informed of and invited to participate in such promotional activities undertaken by the project team.

GOVERNANCE STRUCTURE:

The UDAWG has no formal delegated powers of authority to make decisions, represent Multnomah County or commit to the expenditure of any funds. Instead the group will serve as an advisory body to the project's CTF.

ROLES AND RESPONSIBILITIES

OFFICIAL DUTIES:

To ensure the success of the group, the following roles have been identified:

- County Transportation Director *(participation as required)*
- County Project Manager
- Consultant Project Manager
- Consultant Technical Leader
- Facilitator
- Notetaker
- UDAWG Co-Ambassadors *(nominated by the group as required)*

APPENDIX B: UDAWG MEMBERS AND CHARTER ACKNOWLEDGEMENT

UDAWG Member	Signature
Randy Gragg, Portland Parks Foundation	
Bill Will, Public Works Artist	
Paddy Tillett, ZGF	
Chris Herring, Portland Winter Lights Festival	
Megan Crosby, Urban Development + Partners	
Ian Williams, Deadstock Coffee	
Priscilla Macy, Oregon Outdoor Coalition	
Izzy Armenta, Oregon Walks	
Dave Todd, Portland Rose Festival	
Brian Kimura, Japanese American Museum of Oregon	
Patrick Sweeney, PBOT	
Lora Lillard, BPS	
Hillary Adam, BDS	
Tate White, PPR	
Justin Douglas, Prosper Portland	
Bob Hastings, TriMet	
Magnus Bernhardt, ODOT	

Urban Design and Aesthetics Working Group Project Team

Megan Neill, PE
Multnomah County, Transportation Division
Engineering Services Manager

503-988-0437
megan.neill@multco.us

Project Role: Project Manager

Five years as a project/program manager with Multnomah County Transportation Division, eight years as a bridge engineer with TYLIN and ARUP.

Ian Cannon, PE
Multnomah County, Transportation Division
Transportation Director

503-988-3757
ian.b.cannon@multco.us

Project Role: Transportation Director

Ian Cannon is the Transportation Director and County Engineer for Multnomah County. He served as the Program Manager for the $326 million Sellwood Bridge Replacement. He has been with Multnomah County for over 20 years and has served as Bridge Engineering Manager and Bridge Services Manager. Ian has his B.S. and M.S. in Civil Engineering from Washington State University and is a licensed Professional Engineer in Oregon.

Mike Pullen
Multnomah County
Communications Coordinator

503-209-4111
mike.j.pullen@multco.us

Project Role: Public Involvement Lead

Mike is responsible for public information and public involvement for the county's transportation division, which maintains 274 miles of roads and 28 bridges.

He is the county's lead for public information and public involvement for the Earthquake Ready Burnside Bridge project.

Heather Catron
HDR
Sr. Vice President, Sr. Project Manager

503-423-3724
Heather.Catron@hdrinc.com

Project Role: Consultant Project Manager

25 Years Industry Experience

Heather is a Senior Vice President with HDR with over 25 years of experience in both the public and private sectors. She is currently HDR's project manager for the Earthquake Ready Burnside Bridge Project. Heather has experience leading and implementing program delivery objectives for over $13 billion in transportation investments. This includes managing two mega programs in the Northwest: Washington DOT's $4.65B SR520 Bridge Replacement and HOV and Oregon DOT's $1.3B OTIA III Bridge Delivery programs. She also has experience in the fields of transportation policy and planning, environmental studies, alternative delivery, government relations, sustainability and public involvement.

Steve Drahota, PE
HDR
Vice President, Sr. Project Manager / Sr. Bridge Engineer

503-423-3712
Steve.Drahota@hdrinc.com

Project Role: Consultant Engineering Lead

Steve has over 28 years of bridge design engineering experience on projects located throughout the west coast of the United States. Steve has led the design on over 450 new bridges, bridge seismic retrofits, or bridge rehabilitations of various types, materials, and complexities. Since 2013, Steve has been working with the Multnomah County Bridge Division on the Burnside Bridge as either the Project Manager for the Burnside Bridge Maintenance Project, or the EQRB Project's Technical Lead for the Feasibility and NEPA phases.

Using his knowledge gained while working in California, Steve has become recognized as one of Oregon's premier bridge seismic retrofit engineers. Since 2011, Steve has worked with agencies throughout Oregon to provide seismic resiliency on the state's bridges. In fact, Steve led the development of ODOT's Bridge Seismic Retrofit Design Criteria and has since used it to determine seismic retrofit strategies and cost estimates for over 250 bridges across Oregon.

Michael Fitzpatrick
HDR
Sr. Bridge Architect

415-867-5847
Michael.Fitzpatrick@hdrinc.com

Project Role: Consultant Bridge Architect

Michael has focused on designing bridges for the past 23 years. His role will be to develop the bridge and site aesthetics.

Michael's clients have received the most prestigious awards; ACEC Grand Conceptor for the Hoover Dam and San Francisco Oakland Bay Bridge; ACEC Engineering Excellence Honor Award for the Idaho Trails Bridge; International Bridge Conference Figg Medal for Iconic Bridge design for Royal Park Bridge, Dagu Sun and Moon Bridge, and Hoover Dam; International Bridge Conference Arthur Hayden Medal for Iconic Pedestrian bridge for Idaho Trails Bridge, ASCE regional and national awards for the Lowry Avenue Bridge; and the FHWA Excellence in Design for Context Sensitive Design for the Olympia-Yashiro Friendship Bridge.

Michael has been a member of the Transportation Research Board (TRB) Subcommittee on Aesthetics for 10 years and is the current Chairperson. As part of his TRB responsibilities he has lead Context Sensitive Design Workshops and a co-author on The Sourcebook, a Guide to the Aesthetics of Workhorse Bridges.

Katy Segura
HDR
Project Coordinator

503-423-3709
katy.segura@hdrinc.com

Project Role: Consultant Project Coordinator

Katy has been coordinating state and local agency projects for the Transportation Business Group at HDR's Portland, Oregon office for over two years.

She leads various facets of coordination on these projects, including meeting setup and facilitation, spearheading team communication, managing project documentation, editing reports, and directing the quality control process.

She has played a key role on the ODOT I-5 Rose Quarter Improvements Project, the City of Portland N Rivergate Overcrossing Project, and the Port of Portland Airport Way and NE 82nd Avenue Interchange Project.

Cassie Davis
HDR
Sr. Public Involvement Coordinator

503-727-3922
Cassie.Davis@hdrinc.com

Project Role: Consultant Public Involvement Lead

Cassie has been working in the Portland Metro Region for the past eight years engaging varying community groups and agencies to bring meaningful input and coordination to infrastructure projects. As a Public Involvement Lead, she works as a liaison and communicator between the technical work and human component. Cassie has been working with Multnomah County and the many neighbors and stakeholders of the Burnside Bridge for the past five years.

Jeff Heilman
Parametrix
Principal Consultant

503-341-6241
jheilman@parametrix.com

Project Role: Consultant NEPA and Environmental Lead

Jeff has over 30 years NEPA experience and specializes in managing EISs and the environmental compliance process for major transit and highway projects, bridges, and other public infrastructure including water and restoration projects. He has developed comprehensive strategies and managed EISs for multiple mega-projects with combined construction value exceeding $10B. His work has received national awards for NEPA Excellence, Best New Environmental Technology, Context Sensitive Design, and Project Management Excellence.

Anne Monnier, PE
KPFF
Principal

503-764-0506
anne.monnier@kpff.com

Project Role: Consultant Project Team Member

Anne has over 27 years of structural engineering experience and was named a Principal in KPFF's Portland office in 2009. In her work, Anne takes a highly collaborative design approach, striving to find holistic solutions that marry the owner's needs with the structure's architecture, engineered systems, and construction techniques. Anne's commitment to resiliency motivates her to design structures that withstand environmental impacts yet remain flexible for future adaptations. She actively engages with the A/E/C industry in Portland, including having served as a board member for the Architectural Foundation of Oregon from 2010 – 2019, and on the Critical Building Committee for the Oregon Resilience Plan Task Force from 2011 – 2012.

Anne has led structural efforts on significant projects throughout Portland and finds these particularly gratifying for the role they serve in bringing people in the community together. Her work includes the Portland Japanese Garden Expansion and Cultural Crossing, the recent Portland International Airport's Concourse E Extension, Park Avenue West Tower, and OHSU's Doernbecher Children's Hospital.

Marcy Schwartz
MSS Consulting
Principal

marcy.schwartz4607@gmail.com

Project Role: Consultant Advisor

Marcy has over 35 years of experience in design and implementation of public involvement and decision-making processes for large, controversial public infrastructure projects across the country. She has managed the planning and environmental phases of 26 projects, including the Sellwood Bridge Replacement Project.

Allison Brown
JLA
Project Manager & Facilitator

allison.brown@jla.us.com

Project Role: Consultant Facilitator

Allison brings facilitation, mediation and outreach strategy focused around inclusive involvement approaches. Since joining JLA in 2016, she has managed large public involvement projects across the state, and facilitated community discussion and policy groups shaping the future of the Portland region. Prior to arriving in Oregon, she designed and facilitated peace and reconciliation programs in Northern Ireland, and she brings a keen interest in complex group dynamics and conflict transformation to her facilitation practice.

Jeramie Shane
Mayer/Reed, Inc.
PIC, Urban Designer

971-255-4449
jeramie@mayerreed.com

Project Role: Consultant Principal Landscape Architect

Jeramie brings in-depth expertise in planning and design for transportation improvements, transit corridors and public open space.

As the principal landscape architect on the Earthquake Ready Burnside Bridge project team working with HDR since the Environmental Review Phase, he consults on urban design aspects including place-making and connectivity for the city scale to the pedestrian experience with a focus on sensitively balanced user experiences, safety, aesthetics and sustainability.

Jeramie's additional experience includes Naito Parkway Bike and Pedestrian Improvements, Darlene Hooley Pedestrian Bridge, Tilikum Crossing Bridgeheads and Southwest Corridor Light Rail Urban Design.

Carol Mayer-Reed
Mayer/Reed, Inc.
Principal, Urban Design Advisor

971-255-5790
carol@mayerreed.com

Project Role: Consultant Principal Landscape Architect

A principal and landscape architect, Carol is highly experienced in urban design and transportation projects understanding how they can knit communities together. She inspires creativity and sustainability while working within budgets and engineering parameters.

Carol has deep experience working with local, state and federal transportation and environmental regulatory bodies that shape transportation projects. Her past projects include the MAX Orange Line, Darlene Hooley Pedestrian Bridge and the Green Loop. Carol has also served as an urban design advisor for the SW Corridor and Marquam Hill Connector projects.

Josh Carlson
Mayer/Reed, Inc.
Project Manager, Landscape Architect

971-255-4448
josh@mayerreed.com

Project Role: Consultant Landscape Architect

A landscape architect, Josh focuses on design for public spaces including bridges, streetscapes, light rail corridors, parks, town centers and waterfront trails.

He has been working on the Earthquake Ready Burnside Bridge project as a project manager for the EIS and Urban Design scope since the Environmental Review Phase.

Examples of Josh's additional experience include the Darlene Hooley Pedestrian Bridge and the MAX Orange Line.

EARTHQUAKE READY BURNSIDE BRIDGE

GETTING TO A PREFERRED BRIDGE TYPE

BETTER – SAFER – CONNECTED Fall 2020

	2020				2021					
	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE
Community Task Force (CTF)	• Type Selection phase overview and chartering	• Site context • Opportunities, constraints and trade-offs • Interests assessment	• Evaluation criteria and measures development • Evaluation criteria and measures development	• Evaluation criteria and measures refinement • Range of feasible bridge types • Finalize evaluation criteria and measures • Range of feasible bridge types			• Share public input on range of bridge types and evaluation criteria • Weight evaluation criteria • Review and discuss evaluation screening results	• Work towards bridge type recommendation • Make a bridge type recommendation for community review		• Review community feedback and make final recommendation on bridge type for Policy Group review and approval
Community					Public Outreach: Get community feedback on: • Range of bridge types • Type Selection evaluation criteria				Public Outreach: Get community feedback on: • Recommended bridge type	
Senior Agency Staff Group (SASG)/Agency Workshops	• Type Selection phase overview and chartering		Agency Criteria and Measures Workshop	• Review range of bridge type options • Review draft evaluation criteria and measures		Agency Criteria Rating Definitions Workshop		• Review recommended bridge type		• Review community feedback on recommended bridge type and CTF's final recommendation
City Technical Advisory Committee (TAC)			• Project update • TS overview • City mitigation meetings outcomes		• Review criteria/ measures and feasible range of bridge types			• Recommend bridge type • Comments on DEIS		• Final recommendation • FEIS update
Policy Group (PG)		• Type Selection phase overview and chartering				• Review and approve range of bridge type options and evaluation criteria				• Review and approve recommended bridge type

Multnomah County

EARTHQUAKE READY BURNSIDE BRIDGE

GETTING TO A PREFERRED BRIDGE TYPE

BETTER – SAFER – CONNECTED Fall 2020

2020

SEPT

Community Task Force (CTF)
- Type Selection phase overview and chartering

Urban Design + Aesthetics Working Group (UDAWG)
- Type Selection phase overview and chartering
- Site context
- Universe of bridge types

OCT

Community Task Force (CTF)
- Site context
- Opportunities, constraints and trade-offs
- Interests assessment

Urban Design + Aesthetics Working Group (UDAWG)
- Constraints and opportunities
- Universe of bridge types
- Range of feasible bridge types
- Design principles

NOV

Community Task Force (CTF)
- Evaluation criteria and measures development
- Evaluation criteria and measures development

Urban Design + Aesthetics Working Group (UDAWG)
- Bridge typology
- Design principles
- Evaluation criteria
- Bridge typology
- Design principles
- Evaluation criteria

DEC

Community Task Force (CTF)
- Evaluation criteria and measures refinement
- Range of feasible bridge types
- Finalize evaluation criteria and measures
- Range of feasible bridge types

Community
- Recommendation to CTF on evaluation criteria
- Recommendation to CTF on bridge types

Urban Design + Aesthetics Working Group (UDAWG)
- Evaluation criteria
- Visual and UD guiding principles
- Input on range of bridge types
- Input on range of bridge types

2021

JAN

Community
- Public Outreach: Get community feedback on:
  - Range of bridge types
  - Type Selection evaluation criteria

FEB

Urban Design + Aesthetics Working Group (UDAWG)
- Agency Criteria Rating Definitions Workshop

MAR

Community Task Force (CTF)
- Share public input on range of bridge types and evaluation criteria
- Weight evaluation criteria
- Review and discuss evaluation screening results

Urban Design + Aesthetics Working Group (UDAWG)
- Review community input
- Criteria weightings and rating definitions

APR

Community Task Force (CTF)
- Work towards bridge type recommendation
- Make a bridge type recommendation for community review

MAY

Community
- Public Outreach: Get community feedback on:
  - Recommended bridge type

JUNE

Community Task Force (CTF)
- Review community feedback and make final recommendation on bridge type for Policy Group review and approval

Urban Design + Aesthetics Working Group (UDAWG)
- Review community input and CTF recommendation on preferred bridge type

Multnomah County

DRAFT Statement of Purpose and Need

Introduction

Oregon is located in the Cascadia Subduction Zone (CSZ), making it subject to some of the world's most powerful, recurring earthquakes. Studies show that the most recent CSZ earthquake occurred just over 320 years ago and that there is a significant risk that the next major earthquake will occur within the lifetimes of the majority of Oregon residents.[1] The best available science warns that given current conditions, the next major CSZ event is expected to result in thousands of deaths, widespread damage to our region's critical infrastructure, and long-term adverse social and economic impacts.[2]

The effects of the next CSZ earthquake can be reduced through preparation, including creating seismically resilient transportation "lifeline routes," particularly to provide access to critical facilities in urban areas. Such lifeline routes will facilitate post-earthquake emergency response, rescue and evacuation, as well as enable post-disaster regional recovery and help prevent permanent population loss and long-term economic decline.[2] The importance of having a seismically resilient lifeline route across the Willamette River is why Multnomah County has proposed to make the Burnside Bridge earthquake ready.

Project Purpose

The primary purpose of this project is to create a seismically resilient Burnside Street lifeline crossing of the Willamette River that will remain fully operational and accessible for vehicles and other modes of transportation immediately following a major CSZ earthquake. A seismically resilient Burnside Bridge will support the region's ability to provide rapid and reliable emergency response, rescue and evacuation after a major earthquake, as well as enable post-earthquake economic recovery. In addition to ensuring that the crossing is seismically resilient, the purpose is also to provide a long-term, low-maintenance and safe crossing for all users.

Project Need

The Earthquake Ready Burnside Bridge project is intended to address the following needs:

Need for a Seismically Resilient River Crossing and Lifeline Route

The Cascadia Subduction Zone: Geologic evidence shows that more than 40 major earthquakes have originated along the CSZ fault over the last 10,000 years. The interval between CSZ earthquakes has ranged from a few decades to over a thousand years. The last major earthquake in Oregon occurred 320 years ago, a timespan that exceeds 75 percent of the intervals between major Oregon earthquakes. The Oregon Resilience Plan predicts extensive casualties, infrastructure damage and economic losses from the next CSZ earthquake.[2]

Seismically Vulnerable Willamette River Bridges and Roads: All of the older bridges crossing the Willamette River are expected to suffer seismic damage in a major earthquake. Some are expected to collapse, and none are expected to be usable immediately following the earthquake. In addition, the

east side access roads to all of the downtown bridges, except the Burnside Bridge, pass under and/or travel on aging Interstate 5 (I-5) overpasses that are expected to collapse in a major earthquake, thereby blocking access to those river crossings (Hawthorne, Morrison, Steel and Broadway Bridges).

In addition to having no I-5 overpasses that would block access to the Burnside Bridge, Burnside Street extends 17 miles from Washington County to Gresham with very few overpasses vulnerable to collapse. This is one of the reasons that a Regional Emergency Management group, comprised of cities, counties, Metro and the Red Cross, designated the Burnside Corridor as a "Primary East-West Emergency Transportation Route,"[3] a designation reflected in regional plans.[4] The Burnside Bridge provides a key link in the Burnside Street lifeline route connecting two sides of our region across the Willamette River, and yet in its current condition the Burnside Bridge is far from able to live up to its lifeline designation. At more than 90 years old, the bridge is an aging structure requiring increasingly more frequent and significant repairs and maintenance. Like the other aging county and state bridges over the Willamette River, the Burnside Bridge is expected to be unusable immediately following the next CSZ earthquake.

The state-owned bridges (Ross Island, Marquam, Fremont and St. Johns Bridges) were also designed and built before the CSZ had been identified and understood. The Oregon Department of Transportation (ODOT) expects that all of the state bridges crossing the Willamette River near downtown Portland would be unusable immediately following a CSZ earthquake and has classified expected damage ranging from "collapse" for the Ross Island Bridge and "extensive" for the St. Johns Bridge, to "moderate" for the Fremont and Marquam Bridges. ODOT anticipates that the main river portion of the Marquam Bridge, following inspection and repairs, could potentially be serviceable four weeks after a CSZ earthquake. However, because the I-5 viaducts/ramps on the east side are expected to suffer "extensive" damage, there may be no way to access the Marquam crossing.

ODOT has identified seismic retrofit needs and priorities for the state highway system from the Pacific coast to east of the Cascade Mountains. Estimated costs are in the billions, and ODOT has suggested that implementation could occur in five phases over several decades. The state-owned Willamette River crossings are not the first priorities for the state system, in part because of the high cost to replace or retrofit multiple vulnerable structures. Creating a regionally continuous, seismically resilient Willamette crossing within the state highway system would require retrofitting or replacing at least one large state-owned bridge, as well as multiple overpasses and viaducts.[1] By comparison, the Burnside Bridge is the only structure that would need to be upgraded to create a seismically resilient Willamette River crossing for the regional Burnside Street lifeline route.[4]

The two newest bridges over the Willamette River (Sellwood Bridge and Tilikum Crossing) are not expected to collapse in a CSZ earthquake, but are also not expected to provide the downtown core or the Burnside lifeline route with a viable crossing option after a major seismic event. The Sellwood Bridge was designed to survive a CSZ earthquake and be back in service quickly after the event, and the County mitigated a landslide-prone area near the west end of the bridge. However, the hills above Highway 43 north of the bridge area could slide and block access to the bridge from downtown. Even without such landslides, access to the downtown core and the Burnside lifeline route via the Sellwood Bridge would require approximately 10 miles of out-of-direction travel. The Sellwood Bridge could serve a lifeline

function following a major earthquake, but it would not serve the same broad area, population or downtown core that is served by the Burnside Bridge and Burnside lifeline route.

The Tilikum Crossing Bridge, serving light rail transit, street car, buses, bikes and pedestrians, is also expected to survive and be serviceable following a CSZ earthquake. However, because it is not on or connected to a designated lifeline route, nor intended for general vehicular usage, the approaches to the bridge were designed to "life safety" standards and not intended to provide lifeline functions. Life safety standards result in a structure that will preserve lives by avoiding collapse in a major earthquake, but the structure is not necessarily expected to be usable immediately following such an event. In addition, the west side access to the bridge crosses under several seismically vulnerable I-5 and I-405 viaducts that, in their current conditions, would likely suffer severe damage in a major earthquake and block the route to the bridge.

Need for Post-Earthquake Emergency Response

Absent significant and targeted infrastructure resiliency improvements, the next CSZ earthquake is expected to render all of the downtown Portland Willamette River crossings unusable (either because of damage to each crossing's bridge, its approaches, or both). This means that none of the designated lifeline routes or evacuation routes across the river will be available for emergency response, rescue or evacuation immediately following the earthquake.

Need for Post-Earthquake Recovery

While the cost to build resilient infrastructure is high, it is lower than the cost to a community of losing access to and attempting to rebuild infrastructure following a disaster.[5] Transportation infrastructure damaged by an earthquake impairs the long-term ability of a region to recover economically and socially after a disaster. The lack of resilient transportation can adversely affect a region's population and economy for many years after a major earthquake.[2,6]

Need for Emergency Transportation Routes and Seismic Resiliency as Stated in Plan and Policy Directives

Local plans and policies that designate Burnside Street as a lifeline and evacuation route help describe the need for this project. In addition, statewide policy describes the need through recommendations for creating seismically resilient transportation routes like that anticipated with the Earthquake Ready Burnside project. Relevant plans and policies are briefly summarized here.

Metro's Regional Emergency Management Group was formed by intergovernmental agreement among the region's cities, counties, Metro and Red Cross to improve disaster preparedness, response, recovery and mitigation plans and programs. Current local plans reflect that group's 1996 report which designated Burnside Street as a "Primary East-West Emergency Transportation Route."[3]

The City of Portland's Citywide Evacuation Plan addresses evacuation needs for general disasters including flooding, hazardous materials spills, fires, etc. The plan identifies Burnside Street both as a possible evacuation route east of the river and as a primary east-west evacuation route in downtown Portland west of the river. On the east side, I-84 is the designated primary east-west evacuation route

while Burnside Street is designated a secondary east-side route due to less consistent capacity.[7] However, while I-84 has greater capacity, it would likely be impassable following a major earthquake because of the collapse of multiple overpasses (18 overpasses cross I-84 between the Willamette River and I-205). Burnside Street has no overpasses or bridges through this segment, which is a significant advantage for a lifeline transportation route following a major earthquake.

The Oregon Resilience Plan's specific roadway and bridge recommendations focus on state-owned rather than locally owned facilities. However, this statewide plan emphasizes the importance of creating seismically resilient local bridges and roads, particularly to support lifeline functions in urban areas.[2]

Need for Long-term, Multi-Modal Travel Across the River

In addition to its function as a lifeline route, Burnside Street serves as an important long-term, multi-modal connection between the east and west sides of the Willamette River in downtown Portland and between Gresham and Washington County. The existing Burnside Bridge's five vehicular traffic lanes carry approximately 35,000 vehicles and 30,000 transit trips per day, while the sidewalks and bike lanes carry over 2,000 bicyclists and pedestrians per day. The bridge also carries multiple bus routes and is planned to carry a streetcar line. Any changes to the existing crossing should serve not only the post-earthquake lifeline need but also address the continued long-term need for a safe, multi-modal crossing.

References

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[2] The Oregon Resilience Plan. Report to the 77th Legislative Assembly. 2013
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[3]Regional Emergency Transportation Routes, Portland Metropolitan Region. Metro Regional Emergency Transportation Routes Task Force. 1996
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[4]Oregon Highways Seismic Plus Report
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[5] National Highway Research Collaborative Program Report 777; Chang, 2000. Transportation Performance, Disaster Vulnerability, and Long-Term Effects of Earthquakes;
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[7] Portland Bureau of Emergency Management Annex D | Evacuation Plan
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EARTHQUAKE READY BURNSIDE BRIDGE

Multnomah County is working to create an earthquake ready Willamette River crossing

Understanding the Long Span Alternative

FACT SHEET

BETTER – SAFER – CONNECTED

Summer 2020

What is a long span bridge?

A type of bridge that requires fewer support columns, allowing for longer spacing, or spans, between columns. A vertical support structure above the deck of the bridge is needed to accomplish the longer spans. A variety of vertical structures can be considered for this project, including tied arch, truss, and cable stayed options (see examples on back page).

Why are we considering it?

The long span alternative allows for fewer columns in the Geotechnical Hazard Zones on each side of the river, reducing project risks and costs.

Decisions Regarding Long Span Alternative

Environmental Phase Decisions

Choosing a Preferred Alternative at this stage of the process means deciding on a class of bridge that considers high level variables including:

- Retrofit or replacement
- Alignment
- Width
- Number and approximate location of columns
- Approximate span lengths

Future Phase Decisions

Type Selection Phase Decisions (TS)

- Bridge superstructure type
- Column sizes and locations
- Movable bridge type

Specific to Cable Stayed option:

- Tower location

Final Design Phase Decisions (FD)

- Column shape
- Bridge lighting, railings, color and texture

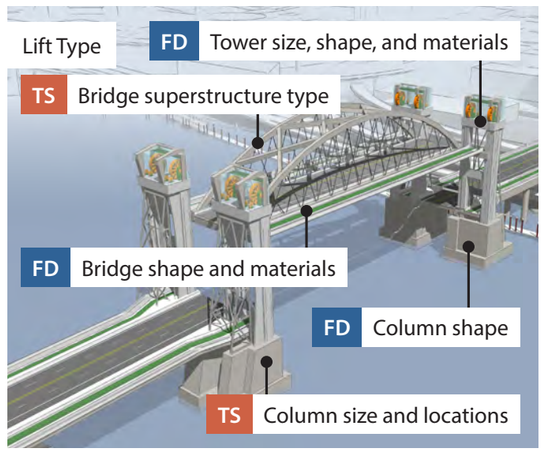
Specific to Tied Arch option:

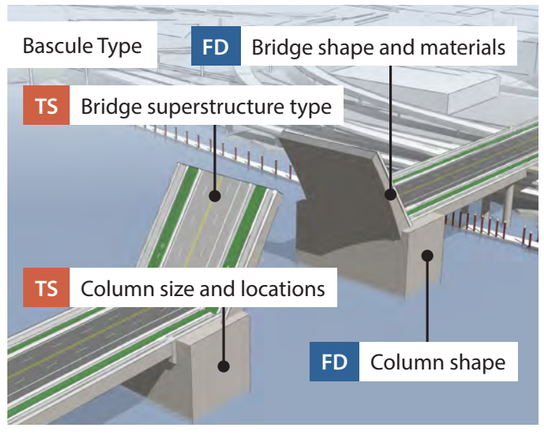
- Arch height
- Arch rib materials, size, curvature, and shape
- Cross-frame size and shape
- Cable size and pattern

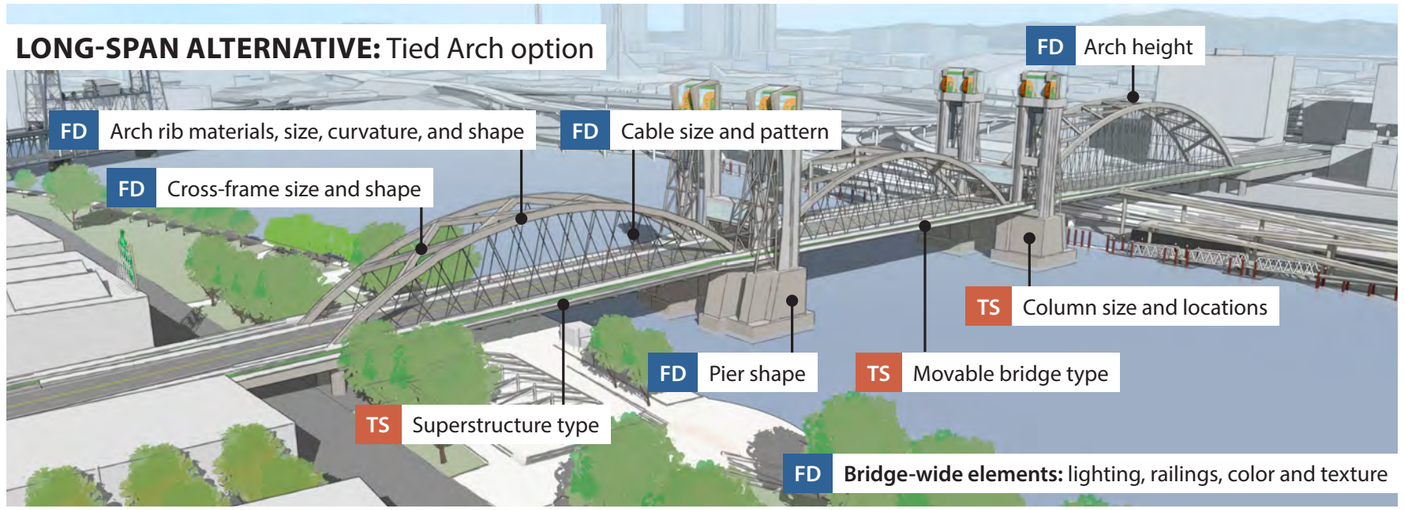
Specific to Cable Stayed option:

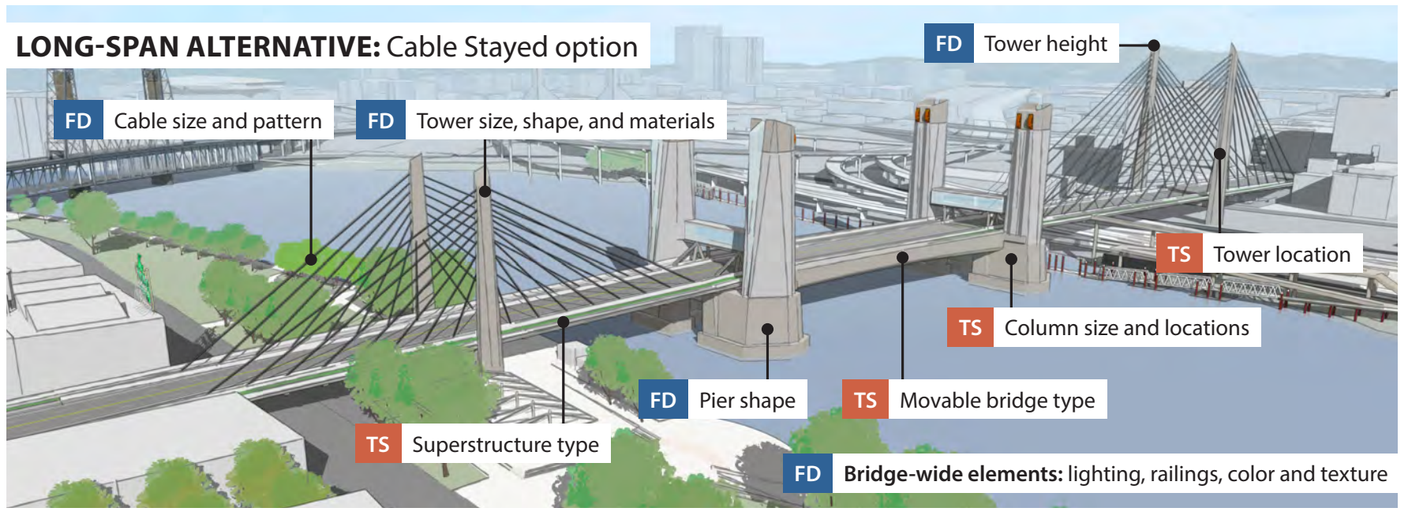
- Tower height, size, shape, and materials
- Cable size and pattern

Movable Span Type: variables for consideration





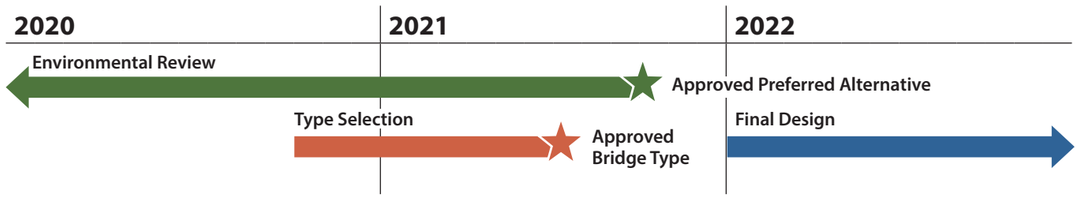




LEGEND:

- TS Type Selection Phase
- FD Final Design Phase

Schedule



Working with the community and agency professionals, we will develop urban design guidelines and evaluation criteria to help in refining aesthetic features during Type Selection and Final Design.

Multnomah County

Bridge Type Examples

BRIDGE TYPE OPTION: Tied Arch examples


Hastings Bridge, Minnesota


Torikai Ohas Bridge, Japan


Siuslaw River Bridge, Oregon


Tacony-Palmyra Bridge, Pennsylvania


Gateway Bridge, Michigan

BRIDGE TYPE OPTION: Cable Stayed examples


Indian River Inlet Bridge, Delaware


Chongqing Expressway Bridge, Oregon


Copper River Bridge, South Carolina


Tilikum Crossing Bridge, Oregon

BRIDGE TYPE OPTION: Through Truss examples


Main Street Bridge, Florida


Triborough (Harlem River) Bridge, New York


Tower Bridge, CA


Broadway Bridge, Oregon


Hawthorne Bridge, Oregon

MOVABLE SPAN: Bascule examples


South Park Bridge, Washington


Harbor Bridge, Spain


New Johnson St. Bridge, Canada


Woodrow Wilson Bridge, Maryland

MOVABLE SPAN: Vertical Lift examples


Teregganu Bridge, Malaysia


Fore River Bridge, Massachusetts


Pont Jacques Chaban, Delmas


Manchester Millenium Bridge, England

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