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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