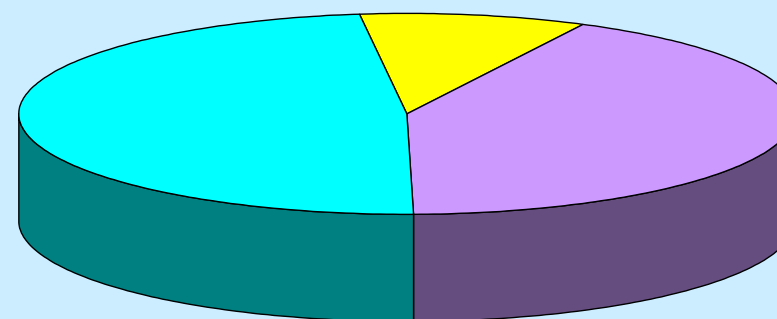


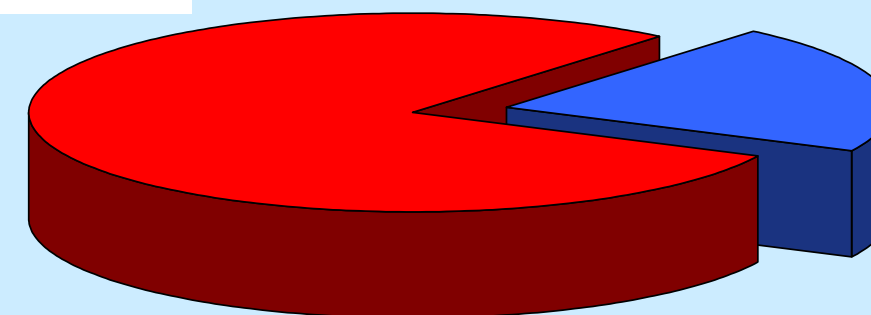
Willamette River Bridges



- Maintained and operated by Multnomah County by state law
- Carry 180,000 vehicle trips per day
- Carry 12,000 bicycle and thousands of pedestrian trips each day
- Newest bridge is 50 years old
- Vital links in regional transportation system
- 20 year funding shortfall of \$490 million
- Operating deficit in 2010, service cuts imminent



■ \$263M - Repairs, Upgrades, Painting, Seismic Ph 1, Seismic Ph 2
■ \$300M - Sellwood Bridge
■ \$58M - Routine Engineering & Maintenance



■ \$131M - 21% Anticipated Funding
■ \$490M - 79% Shortfall



Bridge Repair Needs

Willamette River Bridges – 20-Year Repair Needs

The five Willamette River bridges maintained by Multnomah County in Portland are historic structures between 50 and 98 years old. While recent capital projects have addressed some critical needs, many major repairs remain due to limited funding. These repairs are needed to preserve or improve:

- Safety
- Reliability
- Structural integrity

Deferring important repairs leads to increased deterioration and greater expense when work is finally completed.

Key issues include:

- Corrosion of steel - Older bridges have large areas of exposed structural steel. On several bridges, the paint covering the steel is failing. This leads to rust and corrosion that eventually reduces the strength of the steel members and requires replacement of the steel.
- Mechanical reliability - Four of the bridges are moveable structures that open for river traffic. Some of these bridges have mechanical parts that have worn out after nearly a century of use. If parts fail and a bridge can not operate reliably, the county could be required to keep the lift spans open and close the bridge to surface traffic. Unreliable operation can also lead to unexpected delays to surface or river traffic.
- Earthquake resistance - The bridges were designed and built before the risk of earthquakes was known in Oregon. Only one bridge (Burnside) has been strengthened to help it withstand an earthquake.

Broadway Bridge

- The 94-year-old bridge has a rare design in which steel wheels roll on tracks to open the bridge for river traffic. The wheels and tracks are cracked and worn, and need replacement or repair.
- Repairs are needed on the NW Broadway ramp leading to the bridge from NW Hoyt, where joints between deck sections need to be replaced, worn deck sections need to be repaved, and corroded steel below the deck needs to be replaced and repainted.
- Equalizers balance the load between the two motors that open each side of the lift span. The equalizers are wearing out, which jeopardizes the reliable operation of the lift span. A project would install new equalizers.

Burnside Bridge

- Paint is failing and leading to corrosion on the steel structure below the deck. Old lead paint and corroded steel sections need to be removed before the bridge is repainted with non-lead paint.
- Columns and beams that support the west approach have cracked and settled and need to be replaced or rehabilitated.

Hawthorne Bridge

- The ramps between the bridge and SE Grand Ave. have cracks and worn deck surfaces that need to be repaired and resurfaced. Failing concrete beneath the deck needs to be replaced. Expansion joints need to be repaired. Stairways to the ramps have settled and cracked and need to be repaired. Storm water drains are clogged and need to be cleared. Steel supports and bearings below the deck are rusted and need repainting.
- Original parts of the 97-year-old bridge that bear the weight of the counterweight and lift span are worn, corroded and fatigued after nearly a century of use. A project would rehabilitate some parts and realign others to ensure the reliability of lift span operations.
- Ramps at the west end have deck surfaces that are cracked and rutted and need resurfacing.

Morrison Bridge

- The open steel deck grating on the lift span is worn and requires regular maintenance to repair broken pieces. The grating provides a slick driving surface when wet and allows storm water to enter the river with pollution from vehicles. A project would replace the grating, possibly with a solid surface that would provide better vehicle traction and reduce river pollution.
- The paint is failing on the steel that supports the lift span deck and on the adjacent river spans, leading to corrosion of structural steel. In addition to needing paint, steel that has corroded or cracked needs to be replaced.
- The bridge has no bicycle lanes and narrow sidewalks. A project is planned to create a safe path for bicyclists and pedestrians on the south side of the bridge between SW 2nd Ave. and SE Water Ave. A sturdy barrier will separate the path from vehicle traffic lanes.
- Sections of the deck on the east side of the lift span are worn and cracked and need to be repaired.
- Expansion joints between sidewalk sections are in poor condition and need to be repaired.
- Wiring for the roadway lighting system has deteriorated and needs to be replaced.
- Steel bearings that support the deck on top of columns have shifted and sheared off attaching bolts on the ramps from Grand Ave. The damaged bearings and leaking expansion joints above them need to be repaired, to ensure structural integrity. Corroded steel support beams under the deck need to be repainted.

Sellwood Bridge

- The 82-year-old bridge has serious structural problems, maintenance needs and is not designed to serve the needs of any traffic mode. Its federal bridge sufficiency rating is 2 on a scale of 1 to 100.
- Due to its structural condition the bridge has a vehicle weight limit of just 10 tons. The county's other Willamette River bridges allow vehicles up to 40 tons. Buses and large trucks have not been allowed on the bridge since 2004.
- The bridge is the only river crossing in an 11-mile stretch of the Willamette River. Bicyclists and pedestrians must share a single sidewalk that is just 4-feet wide, while 30,000 cars and light trucks share two narrow traffic lanes with no shoulders to use in the event of an accident, stall, or emergency.
- A current planning project will determine whether the bridge is replaced or undergoes a major rehabilitation.
- Replacement and rehabilitation of the bridge are being studied. If the bridge is rehabilitated, much of it will need to be replaced, including:
 - West side and eastside concrete approach ramps
 - Entire concrete deck, sidewalks, and railings

The remaining steel truss spans across the river will need to be strengthened and the concrete river piers will require repairs.

Projects on Multiple Bridges

- Centerlocks – Moveable bridges like the Burnside, Morrison, and Broadway have centerlocks that hold the two lift spans securely together when the bridge is down. The centerlocks on all three bridges are wearing out, causing the lift spans to vibrate under traffic, creating a safety hazard and risking damage to the bridge. New centerlocks would be designed to do a better job.
- Emergency Drives – An emergency drive provides a small backup motor which can be used to open a bridge for river traffic if a main motor fails. The Broadway, Burnside and Morrison bridges need emergency drives.
- Seismic – The Burnside Bridge is the only county bridge that has been strengthened to withstand an earthquake. Phase 1 seismic upgrades have been constructed on the Burnside Bridge. The new Sauvie Island Bridge is designed to modern standards for earthquake resistance. The other County Willamette River Bridges are in need of seismic upgrades. Phase 1 seismic upgrades strengthen connections between the bridge deck and support columns to prevent deck sections from falling off columns in an earthquake. Phase 2 upgrades strengthen columns and foundations, which costs far more than Phase 1 work. All bridges should receive a Phase 1 upgrade and the Burnside Bridge, a regional emergency route, should receive a Phase 2 seismic upgrade.

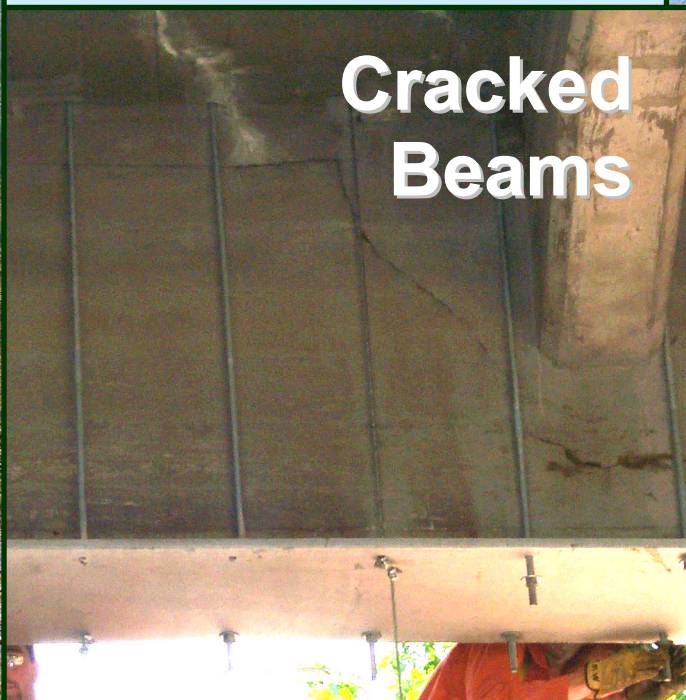


Sellwood Bridge

- Major rehabilitation or replacement
- Carries 30,000 vehicles per day
- Opened in 1925
- Sufficiency Rating of 2 (out of 100)



Twisted Columns



Cracked Beams

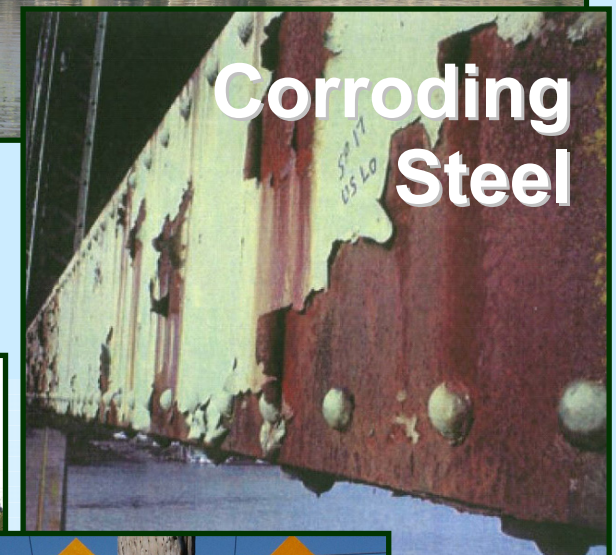


Spalling Concrete

Earthquake Safety
Needs upgrades



Narrow



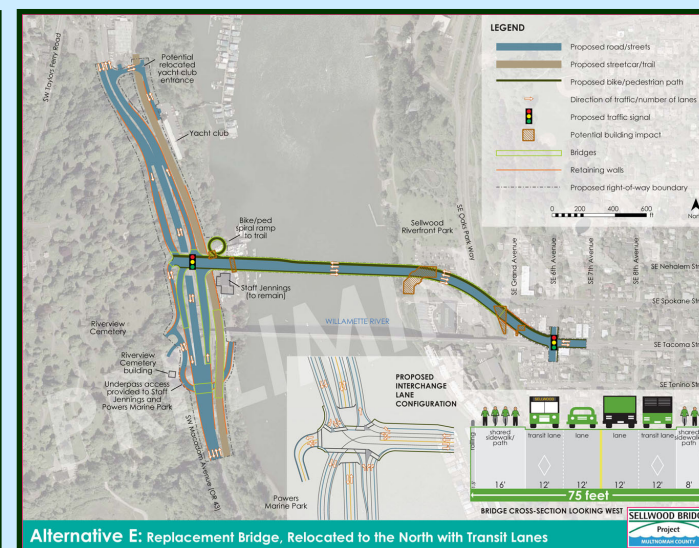
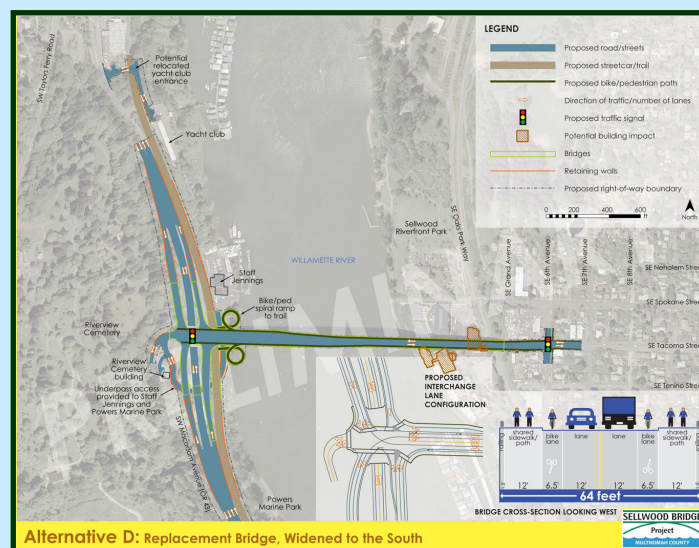
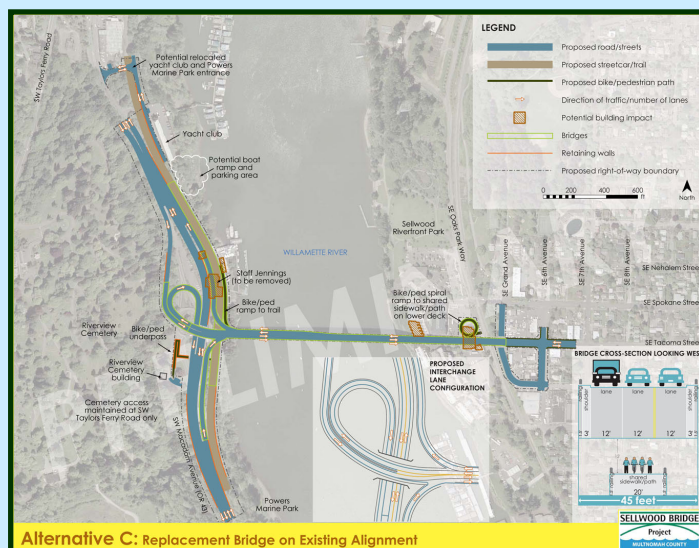
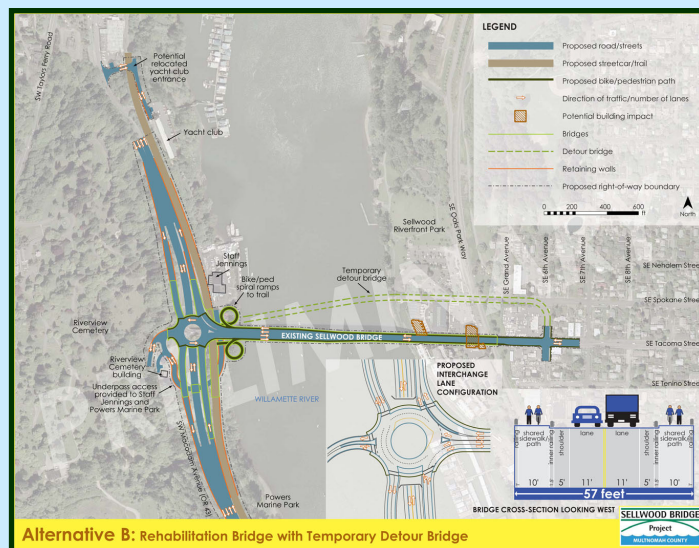
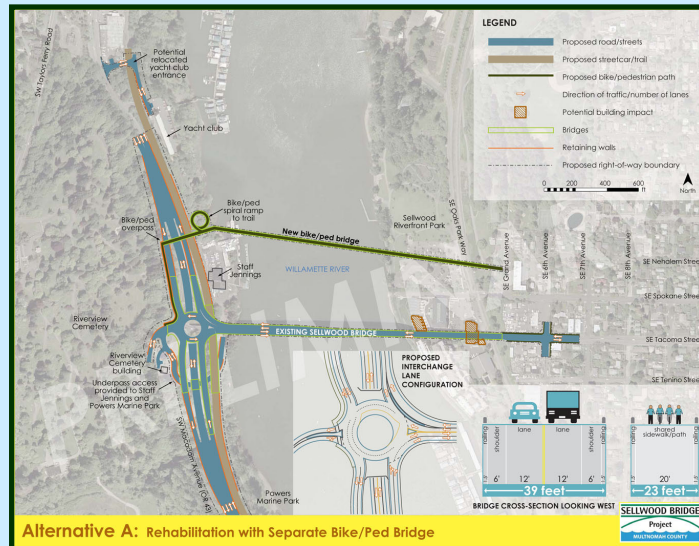
Corroding Steel



**No buses
No trucks**

Sellwood Bridge Project

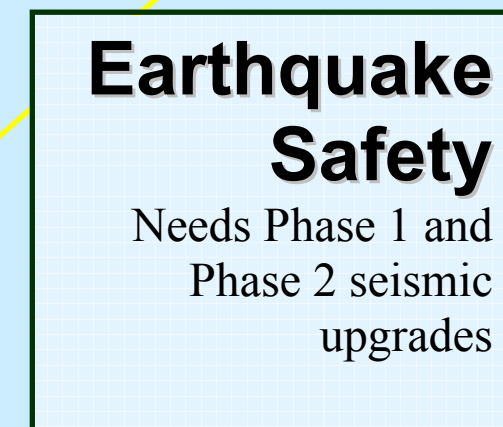
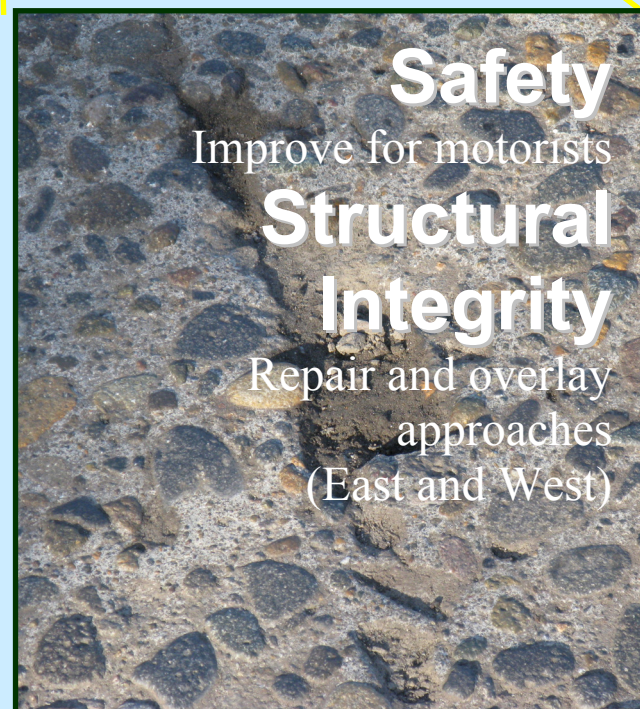
- In process of two year Environmental Impact Study (EIS)
- EIS required by Federal law
- Draft EIS document released in November '08
- Locally Preferred Alternative decision expected in February '09
- Draft EIS analyzed:
 - Major rehabilitation
 - Replacement
 - Alignments (left and below)
 - Cross sections (lane configurations)
 - West and East end intersections
 - Bridge types (at right)
 - Temporary detour bridge
- Federal Highway Administration approval expected in 2010
- www.SellwoodBridge.org





Hawthorne Bridge

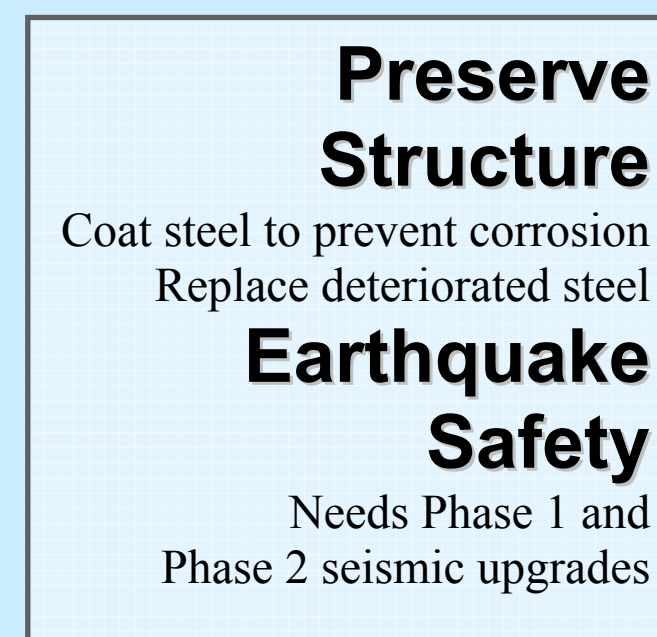
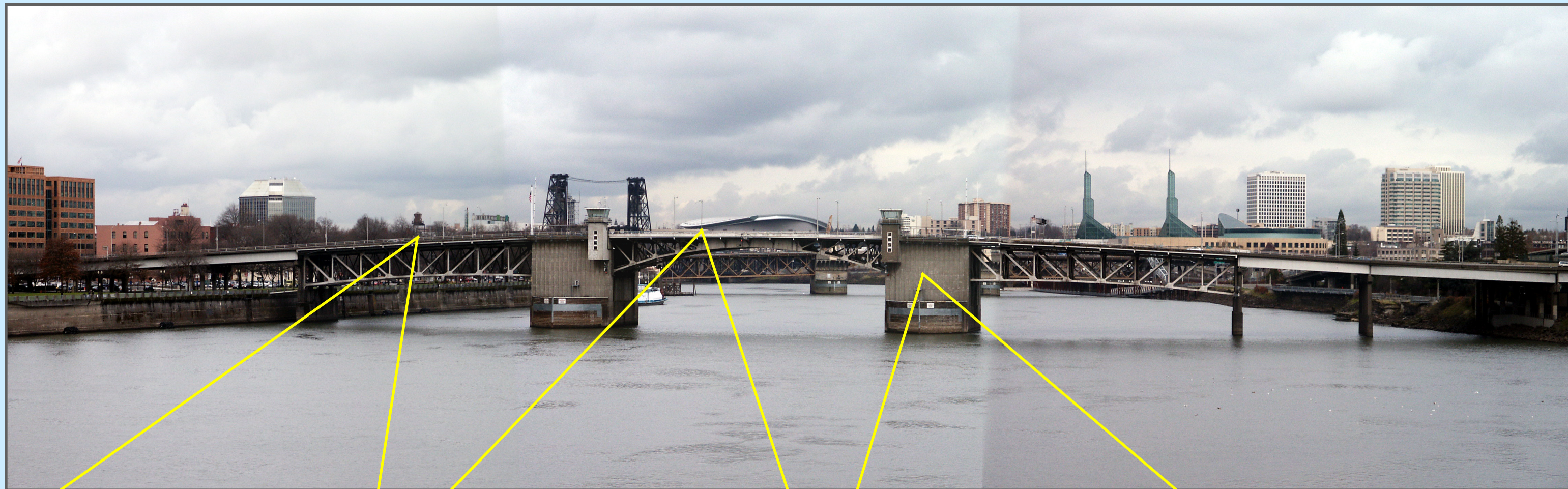
- \$49 million 20 year need
- Carries 33,000 vehicles per day
- Built in 1910





Morrison Bridge

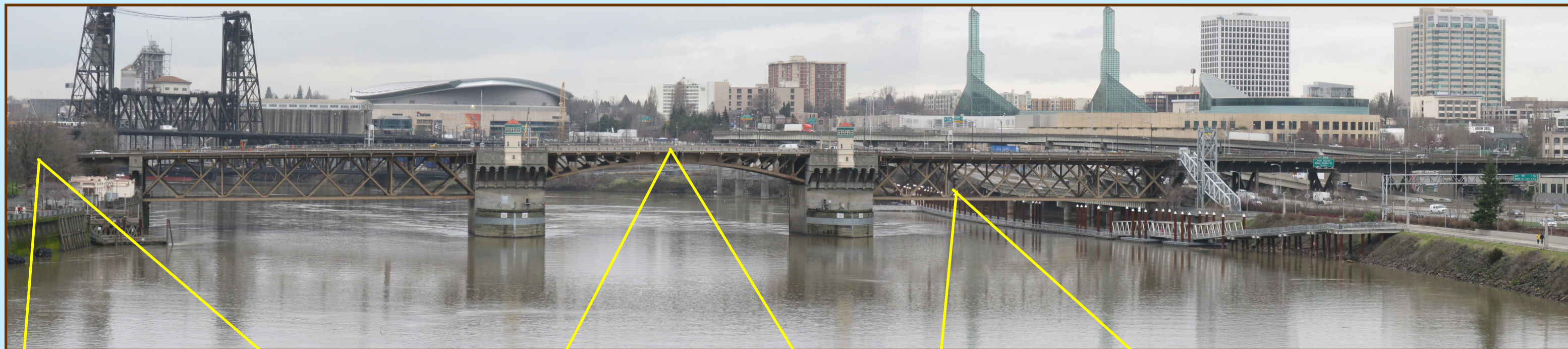
- \$82 million 20 year need
- Carries 50,000 vehicles per day
- Connects I-5 & I-84 to downtown





Burnside Bridge

- \$66 million 20 year need
- Carries 40,000 vehicles per day
- Designated lifeline bridge
- Opened in 1926



Earthquake Safety
Needs Phase 2 seismic upgrades





Broadway Bridge

- \$66 million 20 year need
- Carries 30,000 vehicles per day
- Opened in 1913



Safety

Improve for motorists
Resurface roadway on Broadway approach ramp

Reliability

Rehabilitate 95 year old mechanical components

Preserve Structure

Coat steel to prevent corrosion
Replace deteriorated steel

Earthquake Safety

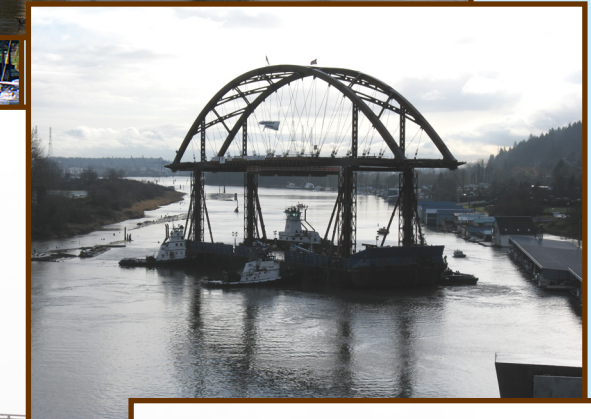
Needs Phase 1 and Phase 2 seismic upgrades

Sauvie Island Bridge

- Opened in 1950
- Sufficiency rating of 6 (out of 100)
- \$44 million new bridge to open in 2008

Old bridge:

- Understrength
- Cracks in concrete
- Vulnerable to earthquakes
- Narrow



New bridge:

- Good for trucks
- Designed for earthquake
- Wider for bicycles and pedestrians

Photo simulation
of new bridge

