



Background

Some Affected Bridges

Portland area

- Slight damage: **Boone Bridge**, I-5
- Slight to moderate damage: **Glenn Jackson Bridge**, I-205
- Moderate damage:
 - **Marquam Bridge**, I-5
 - **George Abernathy Bridge**, I-205
 - **Fremont Bridge**, I-405
- Extensive damage: **St. Johns Bridge**, U.S. 30 Bypass
- Collapse:
 - **Ross Island Bridge**, U.S. 26
 - **Interstate Bridges**, I-5

Salem area

- Collapse:
 - **Willamette River**, OR 22 EB (Center St) Potential of liquefaction and lateral spreading, insufficient longitudinal reinforcement and confining steel on columns (12" spacing in most cases).
 - **Willamette River**, OR 22 WB & OR 99E Business Route (Marion St) Potential of liquefaction and lateral spreading, insufficient longitudinal reinforcement and confining steel on columns (12" spacing in most cases). Spliced longitudinal reinforcement of approach spans' columns. Main spans are not contained transversally.

Coast

- Collapse:
 - **Astoria-Megler Bridge**, U.S. 101
 - **Yaquina Bay**, U.S. 101 Wood piling (on potentially liquefiable soil), insufficient footing reinforcement (no top mat), insufficient confining steel in columns (12" spacing), lap splicing of longitudinal reinforcement. Received Phase 1 seismic retrofit in 1992.
 - **Siuslaw River**, U.S. 101 (Florence) Wood piling (on potentially liquefiable soil), poor footing-pile connection detail (only 6" embedment), insufficient footing reinforcement (no top mat), insufficient confining steel in columns (12" spacing), lap splicing of longitudinal reinforcement.
 - **Coos Bay**, U.S. 101 Wood piling (on potentially liquefiable soil), insufficient footing reinforcement (no top mat), insufficient confining steel in columns (12" spacing), lap splicing of longitudinal reinforcement. Insufficient development length of columns' longitudinal bars into concrete arch ribs. Received Phase 1 seismic retrofit during 2007 and 2013 projects.

Southern Oregon

- Collapse:
 - **N Umpqua R & CORP & Co Rd, I-5 SB** Insufficient footing capacity (small and shallow footings), insufficient and lap spliced longitudinal column reinforcement, insufficient confining steel in columns (18" spacing!) Received Phase 1 seismic retrofit in 1997.
 - **N Umpqua R & CORP & Co Rd, I-5 NB** Insufficient footing capacity (small and shallow footings), insufficient and lap spliced longitudinal column reinforcement, insufficient confining steel in columns (18" spacing!). Lateral spreading very likely. Received Phase 1 seismic retrofit in 2009.
 - **Medford Viaduct, Interstate 5** Insufficient footing reinforcement (no top mat). Insufficient and lap spliced longitudinal column reinforcement, insufficient confining steel in columns (12" spacing). Poor beam-to-column connection detailing (most of the beam's positive reinforcement stops before reaching the column). Received Phase 1 seismic retrofit in 2003.

Note: These performance affects are estimated based on assessment of specific details that exist on these bridges based on typical performance of similar details on bridges in other locations subjected to large seismic events. No complete structural analysis has been completed to model system performance for these affect estimates.