



Oregon

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DATE: March 14, 2013

TO: Senate Committee on Veterans and Emergency Preparedness
House Committee on Veterans' Services and Emergency Preparedness

FROM: Paul Mather, Highway Division Administrator
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SUBJECT: Draft Oregon Highways: Seismic Options Report

Scientists estimate a 37 percent conditional probability that a Cascadia Subduction Zone earthquake will strike Oregon within the next 50 years. A large seismic event of this size will cause loss of life; destroy homes, businesses, and public buildings; and leave large areas of coastal and western Oregon isolated, perhaps for years.

The key to rescue efforts and to short- and long-term recovery of the state's day-to-day services and its economy is a functioning transportation system that includes highways, bridges, waterways, aviation and marine facilities.

All other recovery efforts will depend on the recovery of the transportation system first.

The majority of bridges in western Oregon are susceptible to serious damage or destruction in a major seismic event because they were built before modern seismic codes were in place. Dozens of unstable slopes and pre-existing deep slides are expected to fail under the extended three or more minutes of shaking that will accompany a large Cascadia event. This means bridges and overpasses will fall or be unusable, landslides will come down on roads, and roads will wash into rivers, severely restricting rescue and evacuation work, and utility efforts to repair shattered systems.

The estimates of the impact of a Cascadia quake are just that, estimates, but they are based on what we know of the effects of quakes and tsunamis around the world in the last five years. In 2013 -- two years after the Japanese earthquake and tsunami, which killed 18,000 people -- 300,000 people are still in temporary housing.

We can expect devastating impacts on coastal and Willamette Valley people and infrastructure. As many as 10,000-20,000 fatalities could be followed by 5,000 to 10,000 more because rescuers cannot get to the injured, and medical facilities have been damaged or destroyed.

A 2009 study by ODOT and Portland State found that U.S. 101 would have dozens of bridge failures and would be impassable. All the existing highways connecting U.S. 101 to I-5 would be impassable due to bridge collapses, landslides, fallen trees and washouts. Various segments of I-5 would be unusable due to bridge damage or collapsed overpasses.

Expected damages to the highway system are estimated to create losses in gross state product of \$350 billion over 8-10 years. Many businesses will cease to exist or relocate and not come back.

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In April 2011, the Oregon Legislature directed the Oregon Seismic Safety Policy Advisory Commission (OSSPAC) to lead the coordination of an Oregon Resilience Plan, presented to the Oregon Legislature in March 2013.

The Oregon Department of Transportation participated in the preparation of that report, based on the research it has conducted separately over the past four years. Complementing the Oregon Resilience Report is ODOT's draft Oregon Highways: Seismic Options Report, which provides more focus on the effects of a major seismic event on Oregon's surface transportation system. ODOT has identified critical "Lifeline Routes," which will serve Oregonians as the "backbone" of the transportation system to speed the delivery of lifesaving resources and aid the delivery of recovery resources to reduce the time needed to restore essential services for the recovery of communities and businesses.

Route selection to prioritize resources takes into account three main principles:

Survivability – consideration of emergency response and locations of critical care facilities

Life support – life support resources (food, water, repair crews)

Economic Recovery – critical freight corridors. Mobility into and out of areas, routes between large metro areas

The rate of return on investments to improve seismic survivability is 46 to 1. In other words, by investing dedicated funding starting now, Oregon can reduce the long-term economic impact of a major seismic event by billions of dollars. For example, with a \$1.8 billion investment, Oregon can reduce the effects of a major event by \$84 billion.

The draft Oregon Highways: Seismic Options Report discusses how to address bridges and unstable slopes with an investment in seismic upgrades that can be segmented into three stages and be completed by 2030. The states of Washington and California are far ahead of Oregon in seismic investment. California has upgraded 5147 bridges with an investment of \$13 billion, and Washington has addressed 416 bridges with an investment of \$177 million.

By starting now, we can help Oregon survive better and recover faster from a Cascadia seismic event, reduce the loss of life, reduce the time areas are isolated, and speed economic recovery.