

RELATIVE EARTHQUAKE HAZARD MAPS OF THE AURORA AIRPORT AND ENVIRONS

A significant basis for justifying HB 4092 has been the need for enhancing the Aurora Airport for emergency responsiveness, particularly in the event of a major earthquake or Cascadia event. This is confirmed via an amendment to the bill posted on February 5 which reads as follows:

“SECTION 5. The Oregon Homeland Security Council shall consider a state airport, as defined in section 1 of this 2018 Act, to be a critical emergency preparedness, response, recovery and resiliency platform and shall prioritize state airports for resiliency investments.”.

What is missing from this intention is consultation with the State of Oregon Department of Geological and Mineral Industries, who have performed geological surveys of this area of the State and created Hazard Maps which show that the southern half of the Aurora Airport and runway are located within a significant hazard zone.

These maps follow, and specifically illustrate the following:

The **Relative Earthquake Hazard Map** of the Aurora Airport indicates that the southern half of the existing runway, and all of the proposed runway extension, “based on the combined effects of ground shaking application, liquefaction, and earthquake-induced landslides” are within “Zone B — **Intermediate to high hazard**”. (Zone A is Highest hazard and Zone D is Lowest hazard).

The **Relative Amplification Hazard Map** of the Aurora Airport indicates that the southern half of the existing runway, and all of the proposed runway extension, “based on the degree to which shaking from a given earthquake is likely to amplify” are within the “**Medium amplification hazard** (UBC soil type D)”. (UBC soil type E has the Highest amplification hazard and UBC soil type C has the Lowest amplification hazard).

The **Relative Liquefaction Hazard Map** of the Aurora Airport indicates that the southern half of the existing runway, and all of the proposed runway extension, “based on the likelihood that liquefaction will occur in a given earthquake” is within the “**Medium liquefaction hazard** zone.

The **Relative Hazard Map Earthquake-Induced Landslides** of the Aurora Airport indicates that the southern half of the existing runway, and all of the proposed runway extension, “based on the possibility that a given earthquake will trigger landslides”, are within the “**Low landslide hazard**” zone; the northern half of the Aurora Airport is outside of the Relative Earthquake-Induced Hazard zone.

The report from which the maps are drawn states the following:

This document was prepared by Friends of French Prairie and is submitted for the record on February 6, 2018 to House Committee on Transportation Policy re: HB 4092

"The geology of the [Canby-Barlow-Aurora] area is relatively complex with two units of Quaternary sediments overlying bedrock... part of which is "Columbia River Basalt Group... overlain "by several hundred feet of Pliocene-Pleistocene fluvial silt- and sandstone. The Quaternary sediments consist of silt, sand, and gravel and were deposited by southward flowing catastrophic floodwater associated with drainage of Glacial Lake Missoula (Bretz and others, 1956; Waite, 1985) and flowing south through the area. The floodwaters scoured an irregular surface on the bedrock units, then deposited an irregular body of pebble to boulder gravel on the scoured surface. The gravel is overlain by sand and silt deposited by waning floodwaters. The Willamette and Mollala Rivers have cut into the flood deposits and have deposited small amounts of fluvial sediment on their floodplains."

What is clearly shown in these maps and detailed in the report is that portions of the Aurora Airport are subject to significant earthquakes and associated significant earthquake-related effects (liquefaction and amplification) that a moderate to severe earthquake would in all likelihood render the runway and much of the airport unusable. Further, in the event of a major and catastrophic event such as a Cascadia event, it is highly unlikely that the Aurora Airport runway would be unusable.

The Aurora Airport may be an appropriate site for aviation related relief in the case of forest fires or other types of catastrophes. However to assert that it would functionally survive a major earthquake event is to consciously ignore the geologic realities.

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Map Source:

State of Oregon

Department of Geological and Mineral Industries (DOGAMI)

John D. Beaulieu, State Geologist

These maps were produced by the Oregon Department of Geology and Mineral Industries with funding by the State of Oregon and the U.S. Geological Survey (USGS), Department of the Interior, under USGS award #1434-97-GR-03118

Madin, Ian P., Wang, Zhenming, 1999, Interpretive Map Series IMS-8: Relative Earthquake Hazard Maps for Selected Urban Areas in Western Oregon", Canby-Barlow-Aurora, Lebanon, Silverton-Mount Angel, Stayton-Sublimity-Aumsville, Sweet Home, Woodburn-Hubbard: Oregon Department of Geology and Mineral Industries report, p. 9

Ian P. Madin, Chief Scientist, Oregon Department of Geology and Mineral Industries

Report Download:

<http://www.oregongeology.org/sub/publications/IMS/ims-008/Text/ims-08.pdf>

Maps Download:

<http://www.oregongeology.org/pubs/ims/p-ims.htm>

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Relative Earthquake Hazard Map

Hazard zones are based on the combined effects of ground shaking amplification, liquefaction, and earthquake-induced landsliding.

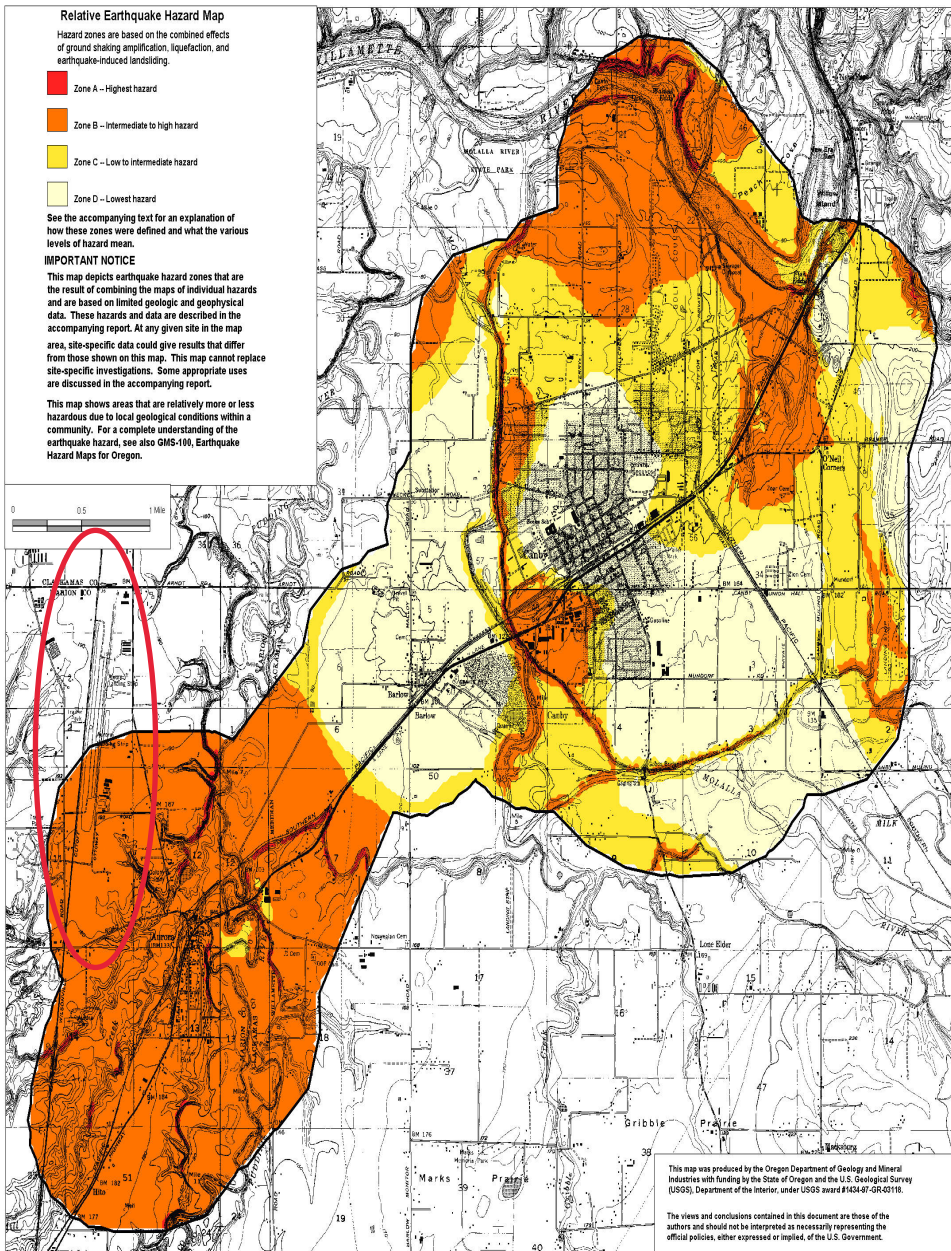
- Zone A - Highest hazard
- Zone B - Intermediate to high hazard
- Zone C - Low to intermediate hazard
- Zone D - Lowest hazard

See the accompanying text for an explanation of how these zones were defined and what the various levels of hazard mean.

IMPORTANT NOTICE

This map depicts earthquake hazard zones that are the result of combining the maps of individual hazards and are based on limited geologic and geophysical data. These hazards and data are described in the accompanying report. At any given site in the map area, site-specific data could give results that differ from those shown on this map. This map cannot replace site-specific investigations. Some appropriate uses are discussed in the accompanying report.

This map shows areas that are relatively more or less hazardous due to local geological conditions within a community. For a complete understanding of the earthquake hazard, see also GMS-100, Earthquake Hazard Maps for Oregon.



This map was produced by the Oregon Department of Geology and Mineral Industries with funding by the State of Oregon and the U.S. Geological Survey (USGS), Department of the Interior, under USGS award #1421-07-JR-0219.

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Relative Amplification Hazard Map

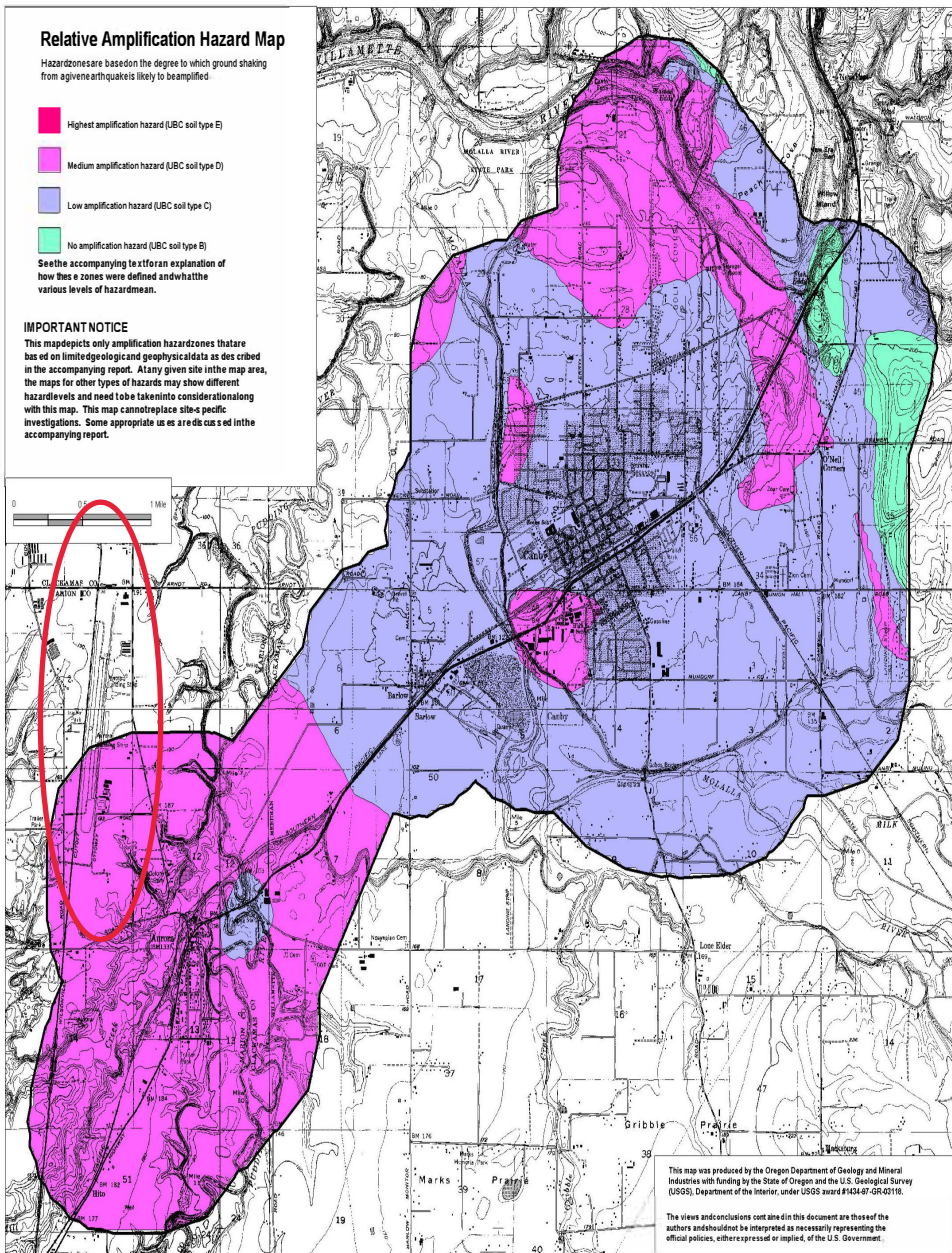
Hazard zones are based on the degree to which ground shaking from agiven earthquake is likely to be amplified.

- Highest amplification hazard (JBC soil type E)
- Medium amplification hazard (JBC soil type D)
- Low amplification hazard (JBC soil type C)
- No amplification hazard (JBC soil type B)

See the accompanying text for an explanation of how these zones were defined and what the various levels of hazard mean.

IMPORTANT NOTICE

This map depicts only amplification hazard zones that are based on limited geologic and geophysical data as described in the accompanying report. Any given site in the map area, the maps for other types of hazards may show different hazard levels and need to be taken into consideration along with this map. This map cannot replace site-specific investigations. Some appropriate use are discussed in the accompanying report.



This map was produced by the Oregon Department of Geology and Mineral Industries with funding by the State of Oregon and the U.S. Geological Survey (USGS), Department of the Interior, under USGS award #1431-07-GR-03118.

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Relative Liquefaction Hazard Map

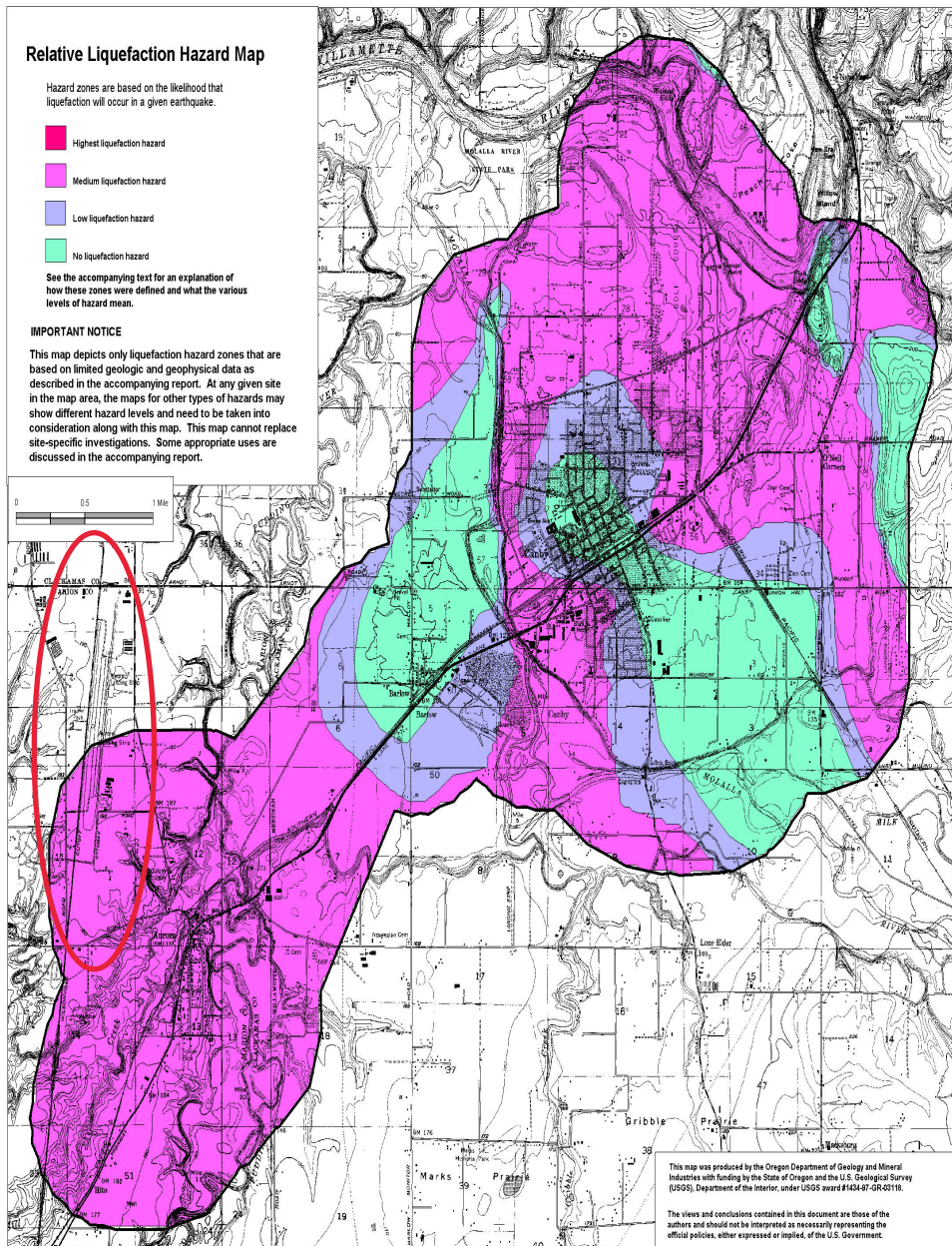
Hazard zones are based on the likelihood that liquefaction will occur in a given earthquake.

- Highest liquefaction hazard
- Medium liquefaction hazard
- Low liquefaction hazard
- No liquefaction hazard

See the accompanying text for an explanation of how these zones were defined and what the various levels of hazard mean.

IMPORTANT NOTICE

This map depicts only liquefaction hazard zones that are based on limited geologic and geophysical data as described in the accompanying report. At any given site in the map area, the maps for other types of hazards may show different hazard levels and need to be taken into consideration along with this map. This map cannot replace site-specific investigations. Some appropriate uses are discussed in the accompanying report.






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Relative Hazard Map of Earthquake-Induced Landslides

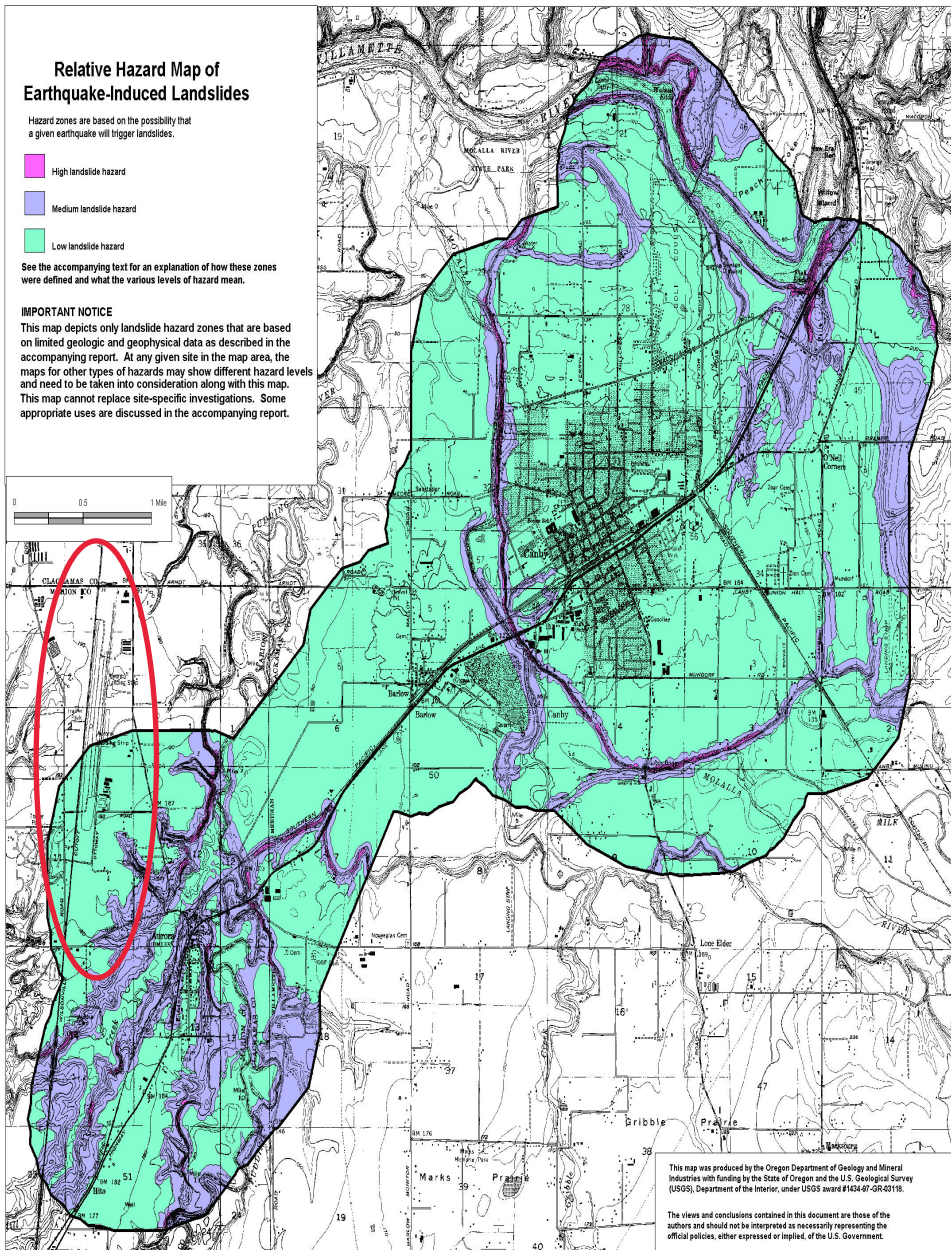
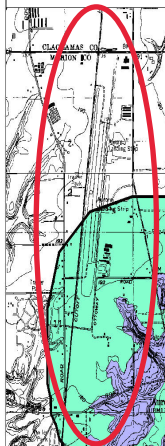
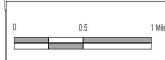
Hazard zones are based on the possibility that a given earthquake will trigger landslides.

-  High landslide hazard
-  Medium landslide hazard
-  Low landslide hazard

See the accompanying text for an explanation of how these zones were defined and what the various levels of hazard mean.

IMPORTANT NOTICE

This map depicts only landslide hazard zones that are based on limited geologic and geophysical data as described in the accompanying report. At any given site in the map area, the maps for other types of hazards may show different hazard levels and need to be taken into consideration along with this map. This map cannot replace site-specific investigations. Some appropriate uses are discussed in the accompanying report.



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