

# Executive Summary

## Background

Based on the latest data from Chris Goldfinger and Oregon State University, there is more than a 20 percent chance in the next 50 years that Oregon coastal communities and infrastructure will suffer severe damage as a result of magnitude 8.0 or greater earthquake and the resulting landslides, tsunami waves, and flooding following a Cascadia Subduction Zone (CSZ) Event. Following this disaster, the City of Newport and other coastal communities will be separated into “islands”. Due to the expected damage to the surrounding ground and marine transportation systems, the Newport Municipal Airport has been designated as critical infrastructure that is essential to facilitating the planned air response, supply distribution; rescue, evacuation, and recovery efforts. For the purposes of this assessment, a Cascadia magnitude 8.0 or greater earthquake is designated as the “design level event”.

## Scope of Work

The Newport Resilience Assessment was funded by the Oregon Department of Aviation’s Critical Oregon Airport Relief Grant Program with the City of Newport providing the necessary matching funds and included the following elements:

- Inventory and background review of existing information including existing emergency plans related to resilience and disaster response
- Meetings with City of Newport Staff and other stakeholders to inventory existing resilience measures and refine resilience goals including a timeline to meet goals
- Visual inventory and assessment of critical airport infrastructure
- Initial geotechnical field work and assessment to evaluate seismic stability of the site and runways
- Structural evaluation of critical buildings per ASCE 41-13
- Preparation of the Newport Resilience Assessment Report outlining findings and recommendations

## Summary of Inventory and Assessment

The Newport Municipal Airport resilience inventory and assessment was completed using available background information, as well as data collected during site visits in 2017 and 2018. The elements were assessed for a generalized resilience risk and rated low, medium, and high. Elements rated “Low” are anticipated to be mostly functional and useable after a design level event and may require relatively simple pre-disaster preparation. Elements rated “Medium” will need repairs in order to be used in conjunction with response and recovery activities and could require more extensive pre-disaster preparation. Those elements rated “High” will need significant repair or are expected to be damaged beyond repair after a design level event, or will require significant pre-disaster retrofit and preparation. A general summary of the assessed risk for critical elements is included in the following table. Based on our assessment, the airport at present is vulnerable and not expected to be operational for fixed wing aircraft after a large seismic event. However, implementation of the incremental improvements listed below will increase Newport Airport’s ability to support CSZ response and recovery activities.

Element	Assessed Resilience Risk	Notes
Soil Stability	High	Geotechnical work at the site determined that existing deep fill soils under the central part of both runways are susceptible to liquefaction strength loss and settlement. It is anticipated that airfield pavements will require repair work prior to being useable. Additionally, slopes around the perimeter of the airport are vulnerable to slumps and failures and likely will be further compromised during an earthquake. Failing slopes are likely to cause fence damage that will compromise airport security.
Airport Compatibility with Planned Response Aircraft	High	Large military response aircraft will have significant weight and/or number of operations restrictions due to existing pavement strength limitations. Planned response aircraft will be unable to operate on some pavements, including parking areas, due to insufficient existing pavement widths.
Buildings	Medium-High	Buildings to include the Fixed Based Operator/Terminal Building and Aircraft Rescue and Fire Fighting (ARFF) Facility are not expected to be operable following a seismic event.
Airfield Equipment and Navigation Structures	Medium-High	In general, equipment is not secured and/or braced against lateral loading and sensitive equipment will likely need to be repaired or recalibrated after a seismic event. Given Federal Aviation Administration (FAA) requirements for frangibility (breakaway) for equipment located in close proximity to aircraft operations some structures will be especially susceptible to damage.
Fuel Storage	High	Onsite storage is low and in general tanks are not secured or braced and pumping mechanisms and connections are not flexible and designed to resist breaking during shaking. Pumps are not connected to generators or alternative power sources and manual options are not available in most locations.
Utilities	High	Public utilities are vulnerable and back-up systems are limited or where available rely on vulnerable fuel supplies.
Communications	Med	Some emergency capabilities for communication on airport and with City are in place. Back-up power is available but vulnerable because equipment is not anchored and requires fuel.
Emergency Supplies and Equipment	Med-High	Some emergency supplies are on hand, but not sufficient to support airport staff and emergency personnel for days to weeks.
Materials for Reconstruction and Repair	High	Airport has very limited ability to perform repairs with materials and equipment onsite.

### Recommendations

The following recommendations are based on increasing resilience at the Newport Municipal Airport to meet the stated goal of an operational airport after a Cascadia Subduction Zone (CSZ) Event. Generally high risk, and relatively low cost fixes are included as short-term recommendations for completion in the next five years and include:

Short-Term Recommendations (5 years)	Order of Magnitude Cost Opinion
Continue to work with stakeholder agencies to ensure that Newport Municipal Airport remains a priority CSZ response airport and that funding to support improvements is made available	Minimal - Perform with existing staff in conjunction with other duties
Additional geotechnical explorations, evaluation, and initial liquefaction and settlement mitigation	\$100,000 - \$200,000
Continued emergency planning, training, and preparation including stockpiling of emergency supplies, repair materials, and equipment	\$100,000 - \$900,000
Planning for Phase I taxiway pavement strength and geometry improvements including construction if funding becomes available	\$1,200,000 - \$3,400,000
Immediate airfield infrastructure improvement needs including increased and existing fuel storage capable of withstanding a CSZ and redundancy for the existing Automated Weather Observation System	\$100,000 - \$800,000
<b>Total Cost Short-Term Recommendations</b>	<b>\$1.5 – \$5.3 million</b>

**Medium and long-term recommendations** will require significant funding and coordination with other stakeholders. For planning purposes, **order of magnitude costs may range from \$39 to \$86 million or more.** Items for consideration beyond the five year planning horizon include:

- Upgrades and retrofitting of critical buildings to include the Fixed Based Operator/Terminal and Aircraft Rescue and Fire Fighting (ARFF) facilities
- Complete geotechnical mitigation (ground improvement) to harden runways against seismic settlement
- Upgrade and retrofit airfield equipment, navigation structures, and communication systems to withstand seismic events
- Complete any remaining short-term pavement strength improvements
- Planning for Phase II and beyond runway, taxiway, and apron pavement strength improvements
- Construct Phase II and beyond, pavement strength improvements as funds become available
- Continue evaluation and implementation of emergency response and recovery plans including stakeholder coordination
- Increase fuel storage capacity
- Stabilize storm drain pipes or design a back-up drainage system