Earthquake Warning California For The Transportation Sector

Don't Get Caught Off Guard

Earthquakes can happen in California at any time. Employees in the transportation sector should be appropriately prepared to react and respond quickly when an earthquake occurs, including using earthquake warnings as part of their preparedness efforts.

The California Governor's Office of Emergency Services (Cal OES) invites the transportation sector, including but not limited to public transit, freight, air travel, ferries, and other modes of transport, to learn about important resources that can help them to prepare and respond when an earthquake happens. This fact sheet outlines some of the resources available through "Earthquake Warning California," California's statewide earthquake warning system, and how they can be applied in various transportation settings.

This document is meant to supplement existing emergency preparedness procedures and help all Californians to learn about available earthquake warning tools and resources to help ensure their safety. Transportation personnel should review earthquake preparedness plans specific to their organization for full information on what to do in an emergency situation.

Earthquake Warning California

Scientists are still unable to predict earthquakes, but thanks to new technology, individuals and organizations can potentially receive a few seconds notice to take appropriate safety precautions before an earthquake strikes. Earthquake Warning California is the first statewide earthquake warning system in the nation, and includes tools such as:

- ***Wireless Emergency Alerts (WEAs)*** that deliver no-cost text messages for emergency situations for earthquakes magnitude 5.0 and higher;
- ***MyShake App***, a free smartphone application that provides users with an audio and visual warning for earthquakes magnitude 4.5 and higher; and
- ***Android Alerts*** that use the same ground sensor technology as the MyShake App and are automatically included in Android phones with updated operating systems.

Earthquake Warning California uses technology to detect earthquakes that have already started and ground motion sensors to estimate the earthquake size, location,

and impact. When the estimate predicts a strong enough magnitude, the Earthquake Warning California quickly issues a warning through its various communication channels (MyShake App, etc.) to warn mobile device users nearby that shaking is about to occur. When users receive a warning, they should immediately take steps to protect themselves, such as to drop to the ground, cover their heads with their arms, and hold onto their necks with both hands until shaking stops.

Benefits and Applications

Planes and Trains

Millions of people, both Californians and visitors, use planes or trains to travel every year. These mass transit vehicles are susceptible to earthquake induced shaking, especially while operating at high speed, which may cause an accident with hundreds of travelers onboard. Earthquake warning systems can help in preventing an accident and injuries / fatalities.

Transportation organizations operating planes or trains can incorporate Earthquake Warning California resources as follows:

- Integrate Earthquake Warning California into an airport's Public Announcement (PA) or alarm system to quickly warn passengers if an earthquake warning is issued, giving them the opportunity to move away from dangerous areas and drop, cover, and hold on
- Integrate Earthquake Warning California into a train stop's communication system to allow passengers in waiting areas or transit stations the opportunity to move away from dangerous areas, and drop, cover, and hold on
- Add Earthquake Warning California to air traffic control operations to provide notice to approaching planes not to land
- Install autonomous automatic stopping systems into commuter train control system

Earthquake Warning California Benefits

- Avoid a potential airplane crash or train derailment
- Avoid a potentially high injury or mortality event
- Give passengers and those in waiting areas warning to move away from dangerous areas like train tracks or large windows before shaking can be felt
- Provide opportunity for travelers in airports, train stops, or onboard trains to avoid dangerous areas and drop, cover, and hold on

Earthquake Warning California Costs

- Installation of autonomous stop systems on commuter and light-rail trains

- Integration of public warning systems with existing communications systems at train stops and airports
- Integration of automatic warning systems into existing centralized communications systems
- Installation cost, including IT staff time
- Annual technology cost, such as internet
- Annual maintenance and service cost for equipment
- Staff time to teach employees about Earthquake Warning California resources and how to take protective actions

Automobiles, Buses, and Freight

Earthquake Warning California can give warning to drivers to slow down or stop the vehicle, and avoid high-risk areas (e.g. bridges, overpasses, tunnels). Vehicles traveling at high speed are more likely to be involved in crashes with other vehicles or stationary objects, resulting in potential injuries and vehicle damage. Large vehicles, such as semi-trucks and passenger buses, are more likely to tip if traveling at high speed during an earthquake without advanced warning.

Individuals and roadway transportation agencies can incorporate Earthquake Warning California resources as follows:

- Integrate smartphone functions into dashboards, allowing a flash to warn drivers to slow down and stop
- Integrate Earthquake Warning California to automatically issue warnings on digital road signs

Earthquake Warning California Benefits

- Prevent earthquake induced car/bus crashes
- Avoid injury car wrecks caused by shaking
- Avoid injuries and deaths from high-risk areas (e.g. tunnels, bridges, overpasses)
- Avoid vehicle damage and infrastructure damage caused by vehicle crashes
- Allow public buses and other transportation to be able to resume operations quickly after an earthquake

Earthquake Warning California Costs

- Installation and integration of autonomous warning systems into existing communication systems
- Time spent to download or enable Earthquake Warning California smartphone applications (i.e., MyShake App, Android Alerts, and WEAs)

Getting Transportation Systems and Employees Prepared

Roadways and bridges are a primary concern during an earthquake, and their destruction can have a significant impact on moving people and equipment long after a natural disaster. The 1995 Northridge earthquake damaged more than 163 bridges and overpasses, six of which collapsed. Careful and thorough emergency preparedness planning can help ensure the safety of employees and travelers, as well as reduce significant damage to essential infrastructure. Below are five tips that can aid in the preparation process:

1. **Conduct Vulnerability & Risk Assessment.** To reduce transportation vulnerability to earthquake damage, all transportation organizations should identify and prioritize hazard mitigation measures and policies well ahead of time. Help employees to understand actions to take in a variety of settings, including on bridges, overpasses, or in heavy traffic. For public transit or other transport involving passengers, determine what actions should be taken if an earthquake warning is issued (e.g., seatbelts, taking cover under seats).

2. **Develop a Mitigation Plan.** Transportation systems should have a plan in place to quickly respond to an oncoming earthquake, such as slowing down and stopping transportation and notifying passengers to take cover. Review which functions can be done automatically when an earthquake warning is sent out and which require manual intervention. Consider posting instructions for passengers in easily visible areas, such as information about earthquake warnings and reminders of how to drop, cover, and hold on.

3. **Download or Enable Earthquake Warning California Resources.** The MyShake App, Android Alerts, and WEAs can supplement existing warning systems and give medical staff and first responders time to take cover before shaking starts. Organizations should demonstrate to employees what an earthquake warning sounds and looks like. Ensure staff knows how to enable mobile devices to get earthquake warnings, such as turning phone location settings to "always on." Warnings do not override silent and "Do Not Disturb" settings.

4. **Incorporate Earthquake Warnings into Existing Emergency Plans.** Transportation organizations should have emergency plans for different levels of emergencies and develop potential responses for each situation. The plan should identify clear roles and responsibilities for all levels of personnel. Consider how to integrate earthquake warnings into existing emergency plans so that personnel can immediately take steps to keep themselves and their cargo (be it hazardous materials or passengers) safe and secure.

5. **Spread the Word.** The transportation sector is an essential service and can aid in educating others on earthquake preparedness resources. Encourage transportation operators and personnel to be familiar with earthquake warning protocols well ahead of time. Determine where information can be posted to help educate employees and / or the public about available resources and what to do in an earthquake.

For More Information

Earthquake Warning California is a comprehensive program of earthquake warning services managed by the California Governor's Office of Emergency Services (Cal OES). The goal of the program is to provide individuals, organizations, and communities with direct and easily accessible emergency preparedness information and resources to keep individuals and families safe in an emergency situation. Visit the Earthquake Warning California website for the latest tools, news, information, and resources: www.earthquake.ca.gov.

For information, questions, or comments relating to this fact sheet, email Cal OES at: earthquakeinfo@caloes.ca.gov