



Android Earthquake Alerts System

Studies show that more than **50% of earthquake injuries can be prevented if users receive an early warning.**

Our mission with ***Android Earthquake Alerts System*** is to help Android users stay safe by sending reliable and fast earthquake early warning (EEW) alerts.

A safety service built for Android users

Supplemental safety alerts for
Android users in a value-added
role

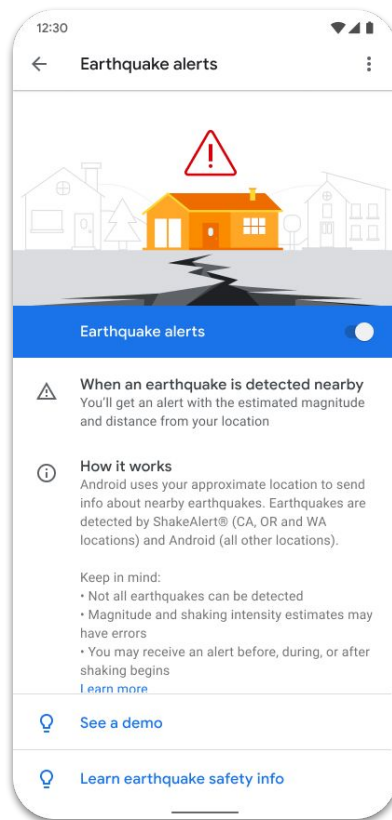
- A **supplemental** service to keep Android users safer
(<https://www.android.com/safety/emergency-help/>)
- **Not a substitute** for government-run earthquake alerting systems



A safety service built for Android users

Privacy-preserving

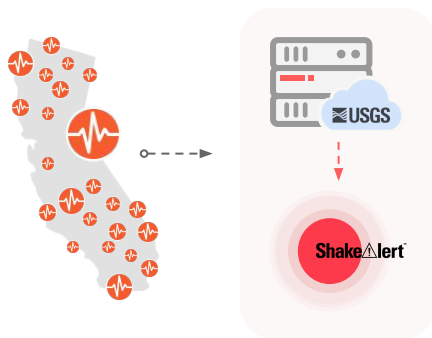
- **Device location and Earthquake Alerts settings must be turned on** in order to receive alerts
- **Opt-out** is available in Android Settings



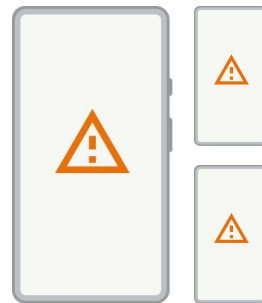
Android distributes USGS ShakeAlert signals in California; uses Android-based detection elsewhere

Some US states

USGS ShakeAlert system & API



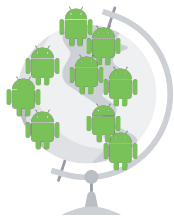
Google Quake server



Android alerts

Global roll-out in progress

Global Android-based detection



Two alerts sent for specific MMI levels

Important: alerts sent only for magnitude 4.5 or higher

1) Be aware alert

- Most people feel weak/light shaking
- Inform users to anticipate shaking

2) Take action alert

- Moderate to extreme shaking is expected
- Get a user's attention, encourage them to take action immediately

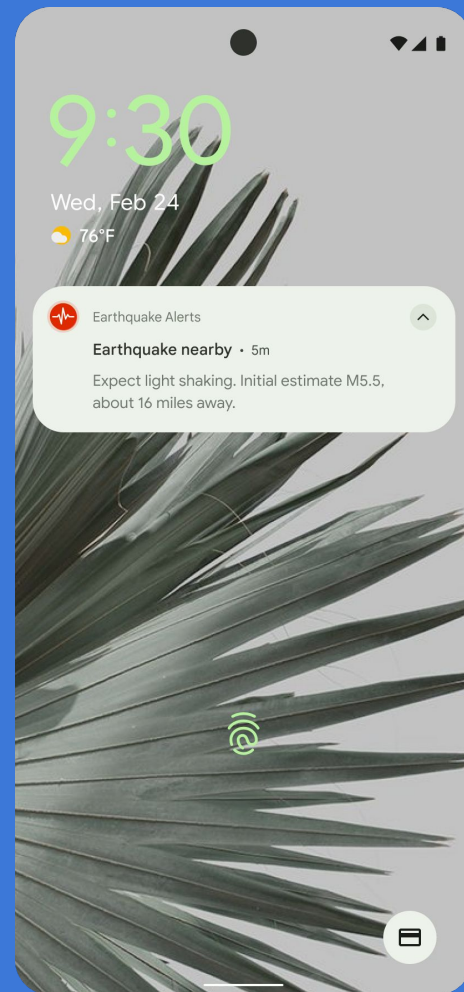
Intensity	Shaking	Description/Damage Equivalent Richter Magnitude
I	Not felt	Not felt except by a very few under especially favorable conditions.
II	Weak	Felt only by a few persons at rest, especially on upper floors of buildings.
III	Weak	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
IV	Light	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Moderate	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Strong	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Very Strong.	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken
VIII	Severe	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Violent	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Extreme	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.

1) Be Aware alert

How Often	Typically few per year
Shaking Intensity	Weak or light Shaking (MMI 3+4)
Magnitude	M4.5+
UX	Standard notification Respects all Do not Disturb settings

Alerting Goals

- Warn users of light shaking occurring/coming soon
- Give users a sense of the scale & location of the earthquake
- Build trust in the alerting system
- Educate users about earthquake safety



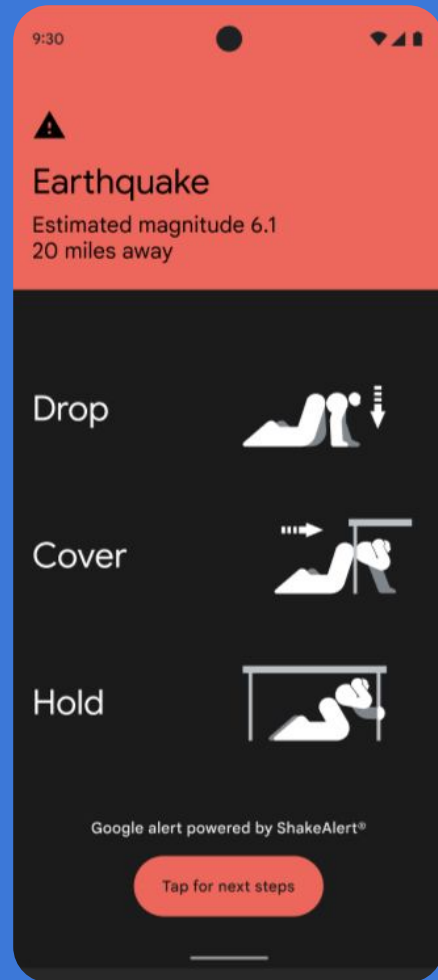
2) Take Action alert

How Often	Typically 1 every few years
Shaking Intensity	Moderate to Extreme Shaking (MMI 5+)
Magnitude	M4.5+
UX	Full screen takeover Unique alarm sounds No vibration

Alerting Goals

- Make users aware as soon as our system detects an earthquake
- Remind users of the best way to protect themselves
- Keep it simple and easy to follow

Google

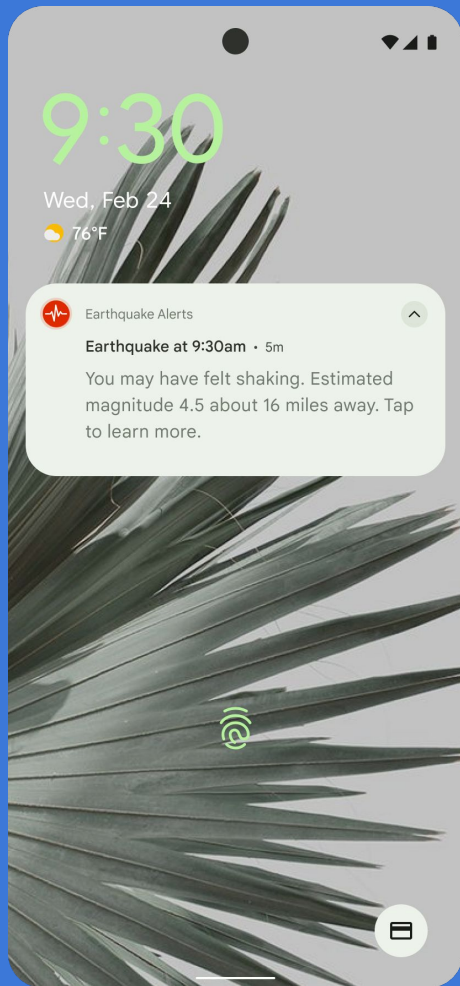


Alert downgrade & late arrivals

When	After shaking has subsided or, after 4 minutes passed
Which alerts?	All alerts
UX	Standard Notification Respects all Do Not Disturb / settings

How it works

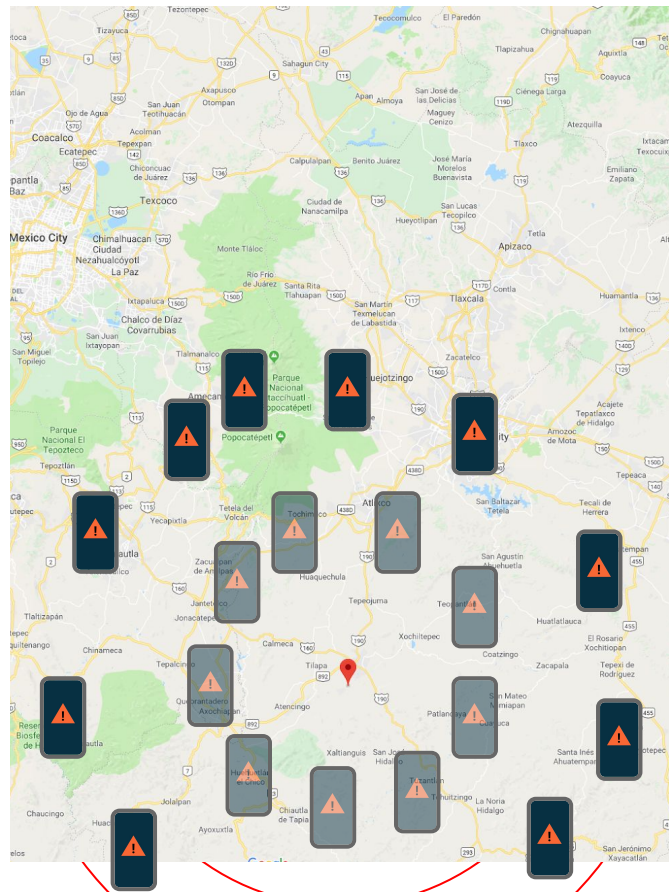
- If an alert is received after shaking has passed, Take Action or Be Aware alerts are **not shown**
- If a user does not interact with an alert after 4 minutes, downgrade the alert to the “earthquake occurred” state



How does the system send updated alerts?

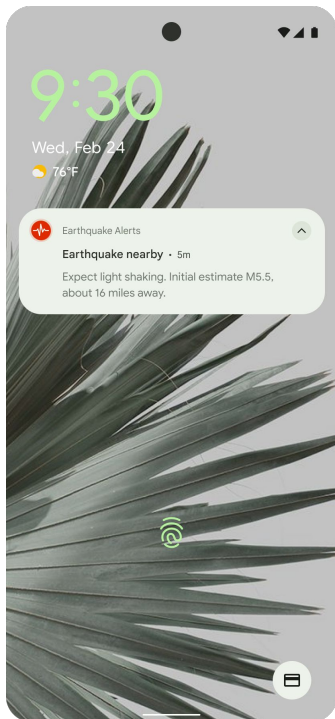
If the estimated earthquake magnitude increases, the MMI contours are updated

- Phones that received the Be Aware notification (MMI 3&4), but are now within the new MMI 5+ contour, will be sent a Take Action alert
- This can replace the Be Aware notification

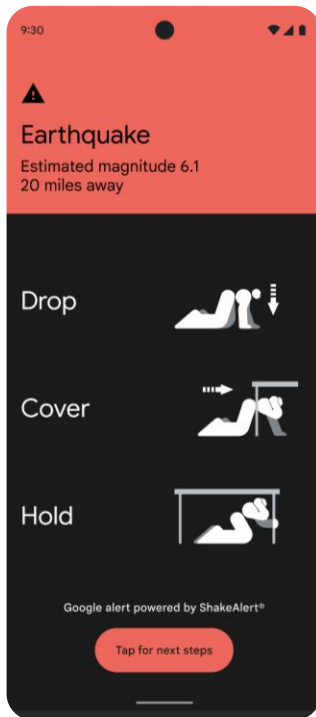


What users see: early warning alert

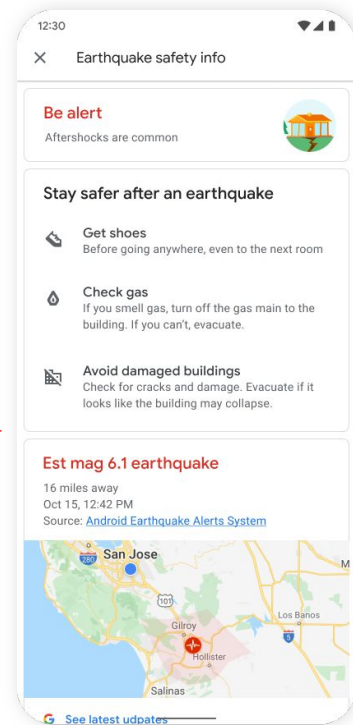
ALERTS



Be Aware Alert
[Weak / Light Shaking]



Take Action Alert
[Moderate / Extreme Shaking]



Earthquake Safety Info
[Cached on Device]

Earthquake information page

Be alert

Aftershocks are common



Stay safer after an earthquake



Get shoes

Before going anywhere, even to the next room.



Check gas

If you smell gas, turn off the gas main to the building. If you can't, evacuate.



Avoid damaged buildings

Check for cracks and damage. Evacuate if it looks like the building may collapse.

Est mag 6.1 earthquake

16 miles away

Oct 15, 12:42 PM

Source: [Android Earthquake Alerts System](#)



 [See latest updates](#)

About

Earthquake alerts and info are provided by Android Earthquake Alerts System

[Learn more or change settings](#)

More safety tips



Get your emergency supplies

If water is shut off, use emergency supplies like a water heater or melted ice cubes



Use caution when cleaning up

- Put out small fires. If you can't, evacuate.
- Check electric, water lines, and appliances for damage. If you see a broken line, shut off the main valve.
- Clean up spilled medicines, drugs, or other harmful materials



Move to higher ground

If you live in a coastal area, relocate as soon as shaking stops to avoid tsunamis



Avoid fallen objects

- Don't touch downed or damaged utility lines
- Don't use a damaged chimney. Approach downed or damaged chimneys with caution.

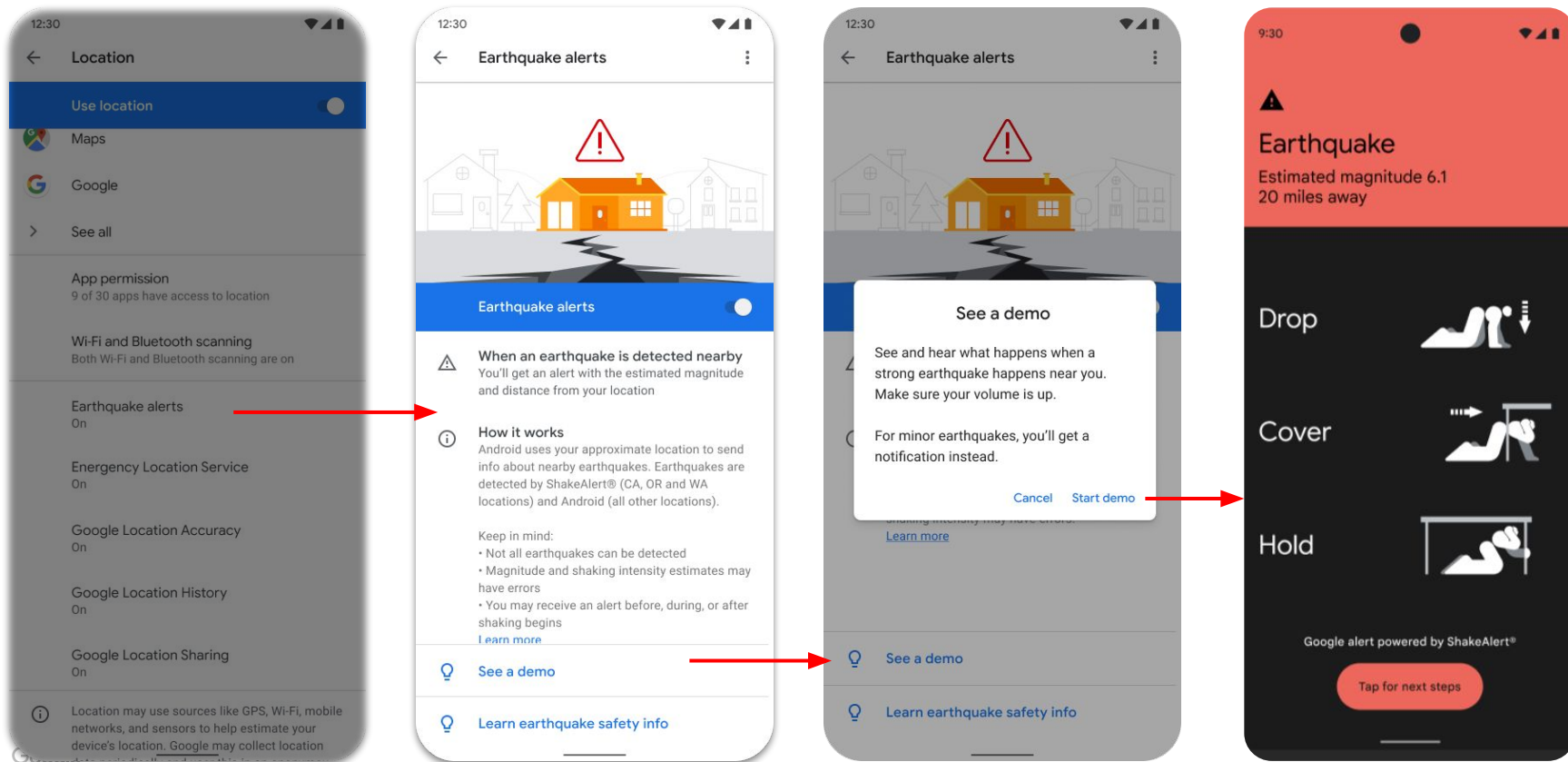


Expect aftershocks

You may receive an alert if an aftershock is expected

[Learn more](#)

Android settings & alert demo experience



Thank you.