GPS, WiFi or mobile network location for workplace alerts?

When a lone worker alarm sends an SOS, a man down alert or a fall detection alert, the message is only part of the response. The other part is location. A response team needs to know where to go, especially on a remote worksite, in a large building or after a worker has stopped moving. GPS positioning, WiFi location and mobile network location each answer that question in a different way, and each has strengths and weak spots.

No single method suits every workplace. The best choice depends on where people work, how often they move, what devices they carry and how much detail a responder needs before leaving for the site. A worker location device used for outdoor travel has different priorities from one carried inside a concrete plant or a multi-level office.

What GPS positioning does well

GPS positioning works by receiving signals from satellites and calculating a position on the ground. For lone worker alerts, its main value is that it can provide emergency coordinates without relying on a local building network. That makes it a strong fit for farms, yards, rural roads, construction sites, parks, utilities work and other places where the worker may be some distance from a fixed access point.

It is most useful when the device has a clear view of the sky. In open air, a GPS fix can help a responder head to the right paddock, gate, track or side of a site. For SOS alerts, that can reduce the time spent guessing where the person was when the alert was triggered.

The trade-off is that satellite signals can be weak or delayed indoors, underground, beside tall structures or in steep terrain. A first fix may take longer after a device has been inside a building or in a vehicle. A location point can also be stale if the worker moved after the last update. For fall detection or man down alerts, a responder may need the most recent position plus a clear note that the device has not moved since.

GPS also uses battery power. A device that reports location frequently may need more regular charging than one that only reports on an alert. Workplaces should think about the shift length, charging routine and whether location updates are requested only during an alarm or throughout the day.



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Where WiFi location fits

WiFi location uses nearby wireless networks to estimate position. Rather than waiting for satellite signals, a device looks at the networks it can see and compares them with known locations. In a workplace with many access points, this can give useful detail inside buildings where GPS may struggle.

This approach suits offices, warehouses, hospitals, schools, factories and other sites where people work across rooms, floors or zones. A responder may not need an exact room number if the alert includes a building and level. WiFi location can be enough to narrow the search and direct a nearby person to the right area.

Its limits are tied to the network map. If access points move, are replaced or are switched off, accuracy can drop. If a worker is near a boundary between two zones, the reported position may sit on the wrong side of a wall or floor. WiFi location also depends on the device seeing the networks, so it may be less helpful in an isolated shed, a remote worksite or an area with no site wireless coverage.

For many workplaces, WiFi is best treated as an indoor layer. It can support location sharing when someone is inside, while another method takes over outdoors. A lone worker alarm used across both settings often benefits from this blended approach rather than forcing one method to do every job.

How mobile network location works

Mobile network location estimates position using the cellular network. One common approach is GSM triangulation, which uses signal information from nearby towers to produce an approximate area. Other mobile positioning methods can use network data and device information to refine the result.

The main advantage is reach. Where there is mobile coverage, the device may still be able to send an alert and provide a rough position even when satellite positioning is poor or WiFi is unavailable. That makes mobile network location useful for workers who travel between sites, move through towns or work in areas where building-based systems do not extend.

The main weakness is precision. A mobile network position can cover a much larger area than a GPS fix or a WiFi estimate. In a rural area with widely spaced towers, the result may point to a general district rather than a specific address. In a city, signals can reflect between buildings, which may confuse the estimate. For emergency coordinates, that difference matters. A response team can still use the information as a starting point, but it may not be enough on its own for a fast search.

Mobile coverage also varies. Some remote worksites have patchy service, and a device cannot send a location update if it has no network connection at all. That is why workplace planning should look beyond the device and consider the areas people enter, including basements, metal-clad buildings, valleys and isolated parts of a property.



Comparing the options for real alerts

The right question is not which method is best in theory. It is what a responder will receive at the moment an alert matters. An SOS may be triggered while the worker is stationary, walking, driving between jobs or after a fall. Each situation can affect the location result.

- GPS positioning is strongest outdoors and in open areas, where emergency coordinates can be useful for reaching a remote worksite.
- WiFi location is strongest inside networked buildings, especially where rooms or floors need to be distinguished.

- Mobile network location offers broad reach where mobile coverage exists, but usually gives a wider area.
- A blended device can choose the available method or provide more than one position source during an alert.

Location sharing also needs a time context. A point captured at the start of a shift is not the same as a live position during an alarm. For man down and fall detection alerts, a system that shows both the last known position and the time of the last movement can help the response team judge how far to search. If updates stop, that gap is useful information, but only if the alert makes it clear.

In New Zealand workplace settings, the mix can change during a single job. A worker may start in an office with WiFi, drive to a rural gate with mobile coverage, then walk into a paddock where GPS is the practical option. A worker location device that handles that transition quietly is often more useful than one that is highly accurate in only one setting.

Mercari Lone Worker NZ is one phrase that may appear when comparing options for workplace safety, but the practical decision remains the same: match the location method to the places where alerts can happen. A device carried mainly in a warehouse may lean on WiFi. A device used on a farm or remote worksite needs GPS positioning that can produce emergency coordinates. A device that follows staff across all three settings needs to manage the handover without confusing the responder.

What to check before choosing

Start with a map of the work. Mark where people are alone, where they go after hours, where mobile coverage is weak and where satellite signals may be blocked. Include ordinary routes as well as unusual ones. If a worker can enter a plant room, a basement, a fenced yard or a long driveway, those places belong in the assessment.

Next, think about the alert itself. Does the response team need a street address, a site zone, a set of emergency coordinates or a last known position? Some alerts may be answered by a nearby supervisor who knows the site. Others may involve an external response team that has no local knowledge and needs clearer detail.

It also helps to check how the device reports uncertainty. A location point with no indication of age or source can be misleading. A good alert should make it clear whether the position came from GPS positioning, WiFi location or the mobile network, and when it was captured. That context helps a responder decide whether to go straight to the point or begin with a wider search.

Battery routine deserves attention too. A worker may carry a device for a full shift and not have a chance to charge it until the next day. Frequent location sharing can change how long a device lasts. Consider whether updates are continuous, triggered by movement or provided mainly when an alarm is raised.



Privacy and workplace policy also shape the choice. Location information should be used for safety purposes and handled carefully. Staff need to understand when location is recorded, who can see it and what happens during an alarm. Clear rules make location tools easier to use as intended.

A worker location device does not need to be perfect in every environment. It needs to give a response team useful information in the environments where lone work actually happens. For

open sites, GPS positioning is usually the strongest base. Inside buildings, WiFi location can add the detail that satellite signals cannot. Across areas with mobile coverage, mobile network location provides reach, even if the result is broader.

The practical answer is often a combination. Look at the way alerts are generated, the places people work and the kind of detail a responder needs at speed. When those needs are clear, the choice between GPS, WiFi and mobile network location becomes much easier to judge.