Earthquake Response

Major earthquakes cause cascading infrastructure failures within minutes: power out, cell towers down, roads blocked. A pre-deployed mesh network can provide a best-effort communication layer (no guaranteed delivery) that requires no external infrastructure but depends on surviving local nodes and their power. It supplements — and does not replace — 911, official alerts, and other backups.

The critical first 72 hours

FEMA advises individuals to be self-sufficient for at least 72 hours after a disaster (FEMA B-526); this window is when an independent mesh can be especially useful:

- Cell service restoration varies widely (hours to weeks depending on damage and region); plan as if it will be unavailable or degraded for at least the first 72 hours
- Landlines may be out for days to weeks in heavily damaged areas
- Internet is intermittent; most social media platforms are unreliable in the first hours due to server load
- A pre-deployed mesh network with solar power and no internet dependency can help provide communications through this window on a best-effort basis (no guaranteed delivery); it should supplement, not replace, official channels and other backups

Infrastructure resilience by node type

Node type	Expected resilience	Key vulnerability
Ground-level portable (T-Echo, T1000-E)	High - battery-powered, no infrastructure dependency	Battery depletion: runtime ranges from roughly a day (active GPS use) to a week or more (low-power, GPS off), depending heavily on configuration — plan to recharge
Building rooftop (solar)	High if solar intact and antenna survived shaking	Antenna damage from building movement; chimney/parapet collapse
Hilltop (solar, remote)	Very high - rarely near structural damage	Snow/debris on panel; equipment theft in post-disaster chaos

Node type	Expected resilience	Key vulnerability
Building-powered (mains only)	Low - loses power immediately	Grid outage (add UPS for short-term backup)

Note: small portable nodes relying only on their internal battery (e.g., the T1000-E's 700 mAh cell) may last only ~12–48 hours in active use; multi-day endurance requires a low duty cycle, GPS off, or an external battery bank. Size for the duty cycle you actually expect.

Neighborhood resilience net design

A "neighborhood net" approach that works well for earthquake-prone communities:

1. **One "net anchor" per neighborhood:** A solar-powered repeater on the highest accessible residential rooftop. Size the battery and panel for your target autonomy (for example, a 7-day-autonomy design goal) using an actual power-budget calculation for your latitude and load — treat multi-day autonomy as a sizing target, not a guaranteed spec.
2. **Block captains with personal nodes:** Each block captain has a device pre-configured for the neighborhood channel. 5 - 10 devices within range of the anchor.
3. **Welfare check protocol:** Pre-established check-in schedule (e.g., every 8 hours). Any block captain who misses check-in triggers a welfare check by neighbors.
4. **Resource messaging format:** Simple standard format: "[LOCATION] STATUS: [OK/NEED HELP] INJURIES: [none/n] DAMAGE: [minor/moderate/severe]"
5. **Community coordination center connection:** The neighborhood net connects to a city-wide mesh via the anchor repeater - aggregate status flows up to emergency operations.

Pre-event preparedness steps

- Deploy solar-powered anchor repeaters *before* an earthquake, not during response
- Distribute personal nodes to all neighborhood net participants
- Conduct quarterly check-in tests to verify devices are charged and configured
- Store node charging cables in emergency kits alongside device
- Document the channel/preset configuration in printed form, stored with the device - don't rely on memory under stress
- Coordinate with local CERT or ARES team so mesh participants know how to integrate with larger response structure

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Revision #3
Created 2026-05-03 04:06:33 UTC by Mesh America Admin

Updated 2026-06-09 18:11:18 UTC by Mesh America Admin