Ski Patrol and Mountain Safety Applications

Meshtastic for Ski Patrol and Mountain Safety Operations

Ski patrols operate across complex 3D terrain where radio shadow zones, terrain park features, tree areas, and cliff bands create communication dead spots. Fixed repeater nodes on lift towers combined with Meshtastic nodes worn by each patroller create a resilient self-healing mesh that maintains communication even when individual nodes are temporarily out of range.

Patrol Dispatch and Incident Response

When a patroller responds to an injury, the first action at the scene is reporting location and preliminary assessment to dispatch. With Meshtastic, a GPS position pin plus short text is transmitted instantly to all on-duty patrollers and the patrol room. Dispatch sees the position plotted on a map overlay, enabling them to route the second responder and toboggan team directly without the first responder describing their location verbally - a significant advantage where run names are ambiguous or the responder is off-trail.

Lost Skier Tracking

A lost skier who carries a Meshtastic-capable device transmits their position passively. Patrol can see the subject on the mesh map without the subject needing to actively call for help - useful when the subject is injured, panicking, or in poor cell coverage. For resorts that issue demo nodes to groups (ski schools, corporate events), this provides a lightweight accountability system.

Avalanche Beacon Integration

LoRa mesh and avalanche transceivers are *complementary technologies targeting different phases of an avalanche incident*:

- **Avalanche transceiver (457 kHz):** Used in the fine search phase when a victim is buried. Short range (under 60 m in search mode), specifically designed for locating buried

victims. Every backcountry traveller must carry one regardless of other communications devices.
- **LoRa mesh:** Used before and after burial - tracking group positions while touring, communicating burial location to responders, coordinating probe-and-dig teams. GPS coordinates from the last transmitted position before burial significantly narrow the search area.

Meshtastic must not be positioned as an avalanche safety device. It does not replace a 457 kHz transceiver. Emphasise the coordination role in all training materials.

Fixed Repeaters on Lift Towers

Lift towers are ideal relay locations: elevated, often with existing electrical infrastructure, maintained by resort staff, and covering the entire lift corridor. Approach the resort's mountain operations manager with a brief proposal framed around patrol safety and lost-skier response. Key points for the proposal:

- Hardware is small (roughly the size of a hardback book), bolt-mounted to the tower
- Power draw under 1W continuous - negligible on a circuit that already powers lift lighting
- No software integration with resort systems required
- Hardware removable at end of season if the pilot is not renewed

Most resorts that have evaluated this concept have been receptive, particularly when framed around improving lost-skier response times and patroller safety.

Terrain Park Safety

Terrain parks concentrate injuries in a small area with complex sightlines. A fixed relay node covering the park enables park crew to maintain communication with patrol without handheld radios that are impractical while inspecting features. A simple "park clear / park hold" message system reduces the need for patrollers to ski through the park to check status.

Backcountry Touring Group Communication

For backcountry touring groups using a resort as a staging point, Meshtastic provides group communication beyond the resort boundary where resort radios do not reach. Groups splitting into separate lines on a peak stay in GPS contact. The guide shares turn waypoints and safe descent markers. If a member is injured, their position is immediately visible to the rest of the group without requiring anyone to be in an exposed position to maintain radio line of sight.

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