Quarry & Mining Vehicle Proximity Detection

System Selection and Commissioning Checklist — backwatch.co.uk

Use this checklist when specifying or commissioning proximity detection systems on quarry and mining plant. Complete at specification stage and again at commissioning.

1 — Site Risk Assessment

- ■ Map all haul roads, operating areas, and zones where vehicles and pedestrians interact
- ■ Identify fixed high-risk points: blind corners on haul roads, dump points, crusher feeds
- ■ Assess pedestrian access control (determines tag vs tagless technology choice)
- ■ Assess ambient noise levels — if >85dB, audible-only alerts are insufficient
- ■ Assess dust/fog/low-light conditions — determines camera system suitability
- ■ Document assessment under Quarries Regulations 1999 and HSE L118 framework

2 — Technology Selection

- ■ Tag-based RFID/UWB: select if controlled access and tag wearing is enforceable (360° through dust)
- ■ Camera/AI (HFR): select if open access or tagless detection required — assess dust/light conditions
- ■ Radar: select for haul roads, adverse weather, long-range detection (>5m) in dust/fog
- ■ V2V detection: specify if multiple large vehicles share haul roads or operating areas
- ■ V2I: specify for fixed hazard points (blind corners, dump zones, crusher approach roads)
- ■ Combination approach confirmed where environment limits any single technology

3 — Vehicle-Specific Specification

- ■ Haul trucks: 360° coverage — rear, side, and front corners; V2V detection configured
- ■ Excavators: tag antenna on slew ring (rotates with upper structure); swing arc detection active
- ■ Wheeled/shovel loaders: front AND rear detection (travel in both directions equally)
- ■ ADTs: trailer-mounted rear sensors + separate tractor antenna; covers full articulation range

- Detection range confirmed adequate for vehicle stopping distance at site speed limit

4 — Alert Mechanism

- In-cab: audible + visual (operator alert — isolated from external noise)
- Vehicle-mounted: high-intensity strobe/beacon visible to pedestrians at range
- Pedestrian-worn: haptic (vibration) alert on tag — does not rely on hearing
- Multi-level alerts confirmed: outer caution zone + inner stop zone escalation
- Alert mechanisms tested in actual site ambient noise conditions, not office demo

5 — Commissioning and Regulatory Documentation

- PUWER risk assessment updated to reference proximity detection as a control
- Quarries Regulations 1999 traffic route assessment documented
- HSE L118 controls checklist completed
- Near-miss event log capability confirmed on system
- Tag issue protocol established at site entry for tag-based systems
- All operators trained on alert progression and expected response
- Maintenance schedule set including dust cleaning frequency for sensors/cameras