# Collisions Awareness for Mobile Equipment

*iVolve Mine4D Proximiti*™ integrates best of breed with two forms of proximity awareness; GPS and short-range radar.

The combination and redundancy of these systems provides enhanced situational awareness for operators of heavy, medium and light vehicles. Multiple built-in redundancies give equipment operators the highest levels of confidence that *Proximiti* is keeping them safe as they drive around site.

*Proximiti* is designed for the rugged environments of mine sites, construction sites and industrial fleets. The system alerts the vehicle operator while also logging events to via the iVolve Server. The system also supports full play-back capability for incident investigation purposes.

Proximity Detection and Collision Awareness systems provide direct benefits with:

- **Safety.** With the growing emphasis on occupational health and safety, tools to assist with safety on mine sites are becoming increasingly important.

- **Reduce Costs**. Incidents on sites have direct cost implications in both injuries and asset repair or replacement. Sever incidents can also lead to sites being shut down. *Proximiti* helps to avoid these incidents, resulting in reduced downtime for vehicles and significant cost benefits.

## LOCATION MONITORING

A typical iVolve installation on a vehicle provides many of the components required for a Proximity detection system, including peer-to-peer mesh communications and an integrated GPS receiver. As a result, GPS-based proximity detection can be enabled via a simple software upgrade. The in-cab display option is then used to alert the operator of any vehicles in the area, including information such as the bearing and their speed and heading.

## GPS PROXIMITY DETECTION

The final configuration of Proximiti further enhances the operator reporting capabilities through the introduction of GPS proximity detection.

Each vehicle has a virtual "bubble" of protection based on its current GPS position. This solution for vehicles travelling at low and high speed, addressing the common problem of light vehicles overtaking heavy machinery on haul roads by ensuring that the operators are aware of all vehicles around them at any given time.
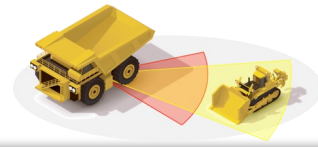
## RADAR PROXIMITY DETECTION

With the installation of the optional short-range, radar-based sensor modules, the *Prioximiti* solution allows each vehicle to detect passive objects located near it, including people, structures and vehicles that do not have an iVolve solution installed. These sensors augment the GPS-based capabilities to provide a comprehensive and redundant solution, featuring:

- Vehicle-to-vehicle proximity detection using a fault-tolerant hardware solution based around the proven Nexis platform.

- A combination of GPS (and/or GPS augmentation) and sensor technologies to accurately determine the position of other vehicles, and to then warn the operator.

- Innovative techniques ensure the dynamic location information is received by every other iVolve-capable device. These techniques eliminate the complex and error-prone handshaking and detection mechanisms used by other proximity systems based on standard Wi-Fi connections and/or RFID.

- A secondary network of range sensors ensuring detection is still available even during periods where no GPS is available.
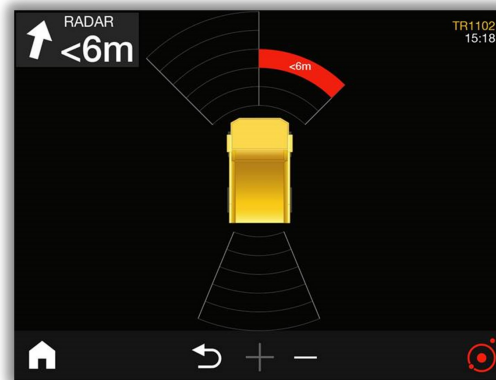
## MONITORING AND ACCIDENT INVESTIGATION

**To provide assistance in evaluating incidents, a playback reporting tool is provided through *iControl*™.**

**iControl™ is the map based visualization tool of the iVolve solution giving you complete real-time monitoring and control of your site's mobile fleets and static assets. This intuitive, interaction interface to your iVolve site systems allows you to monitor production, direct maintenance, prevent in-service failures and manage site safety issues.**

**Using GIS technology, the locations of vehicles over time are displayed. Specific timeframes can be selected and replayed to view the lead up to incidents and specific vehicle interactions.**

iVolve Mine4D Proximiti

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