

# Personnel Tracking Solutions

Smart sites by iottag™

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Specialised technology to increase  
safety and efficiency in mining



# Table of Contents

- Hardware
- Architecture
- Software
- Core Data
- Insights
- Aim
- Solution
- Capabilities
- Quotation (attached)

**Know what you have and  
where it is in real-time**

## OUR PROCESS

# Automation & Data Intelligence

We are experts in collection of data, facilitated by technology agnostic systems harnessing unrivaled millisecond reporting and high fidelity sensor capabilities.

Yet it is how we process and visualise the data that makes us great.

**Collecting and Organizing Data:** Gathering activity data and behavioural characteristics of Personnel, Vehicles, Machinery and Equipment.

**Analyzing and Interpreting Data:** Draw insights from the data through identifying patterns, trends, correlations, or anomalies.

**Using Data to Make Decisions:** Unlock data insights, identify waste and opportunities for improvement to enable confident and strategic business decisions.



## 1. Tracking Tag

Monitor an assets location and behaviours, interact with the users through lights and audible queues



## 2. Data Processing

Data processing, exploration and analysis for evolving business requirements and data models



## 3. Application

Locate, monitor, receive alerts and notification to manage your operation

# Enterprise Personnel Management Applications

- Management Portal
- Management App
- Field App
- Boardroom Live Screens

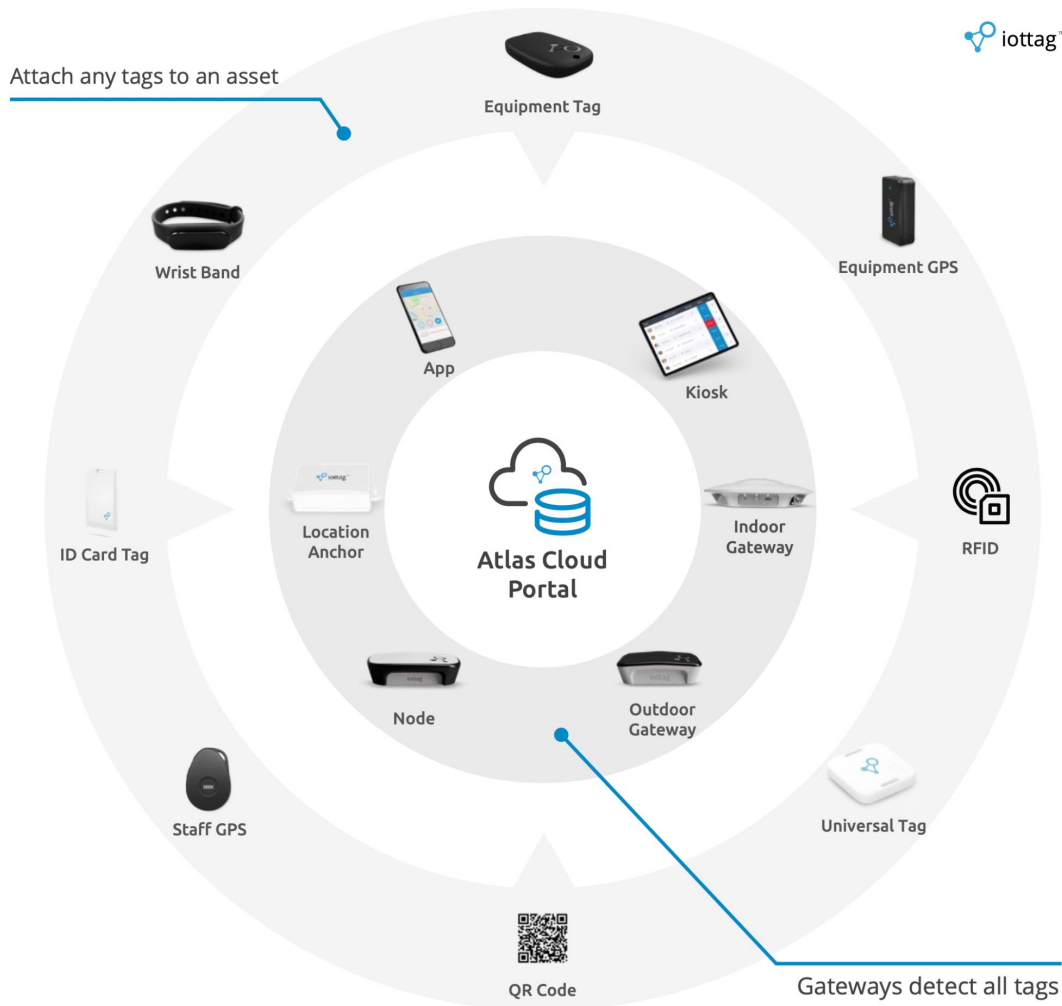


### Plug & Play

## Solutions Specific Tracking Sensors

Flexible, accurate, and reliable tracking devices for above and below the ground applications. Track and monitor personnel, vehicles, machinery and equipment.

\* Diagram displays a small sample of all hardware options available.



## FIT FOR PURPOSE

# Personnel Safety

Next generation, personnel centric wearable safety device your workforce **will want to wear**.

- **Millisecond Location** Tracking
- Tunnel Occupancy Control
- Muster Point Occupancy
- Instant SOS Alarm
- Audible Evacuation Alarm
- Call To Locate Lost Tag
- Vehicle Proximity Alerts
- Smart Lighting Control
- Ventilation Control
- Compliance Policing



Learn more about [Connect Workforce](#)



**NOTE:** ID Card Tag chosen as opposed to V7

## Personal SOS Alarm

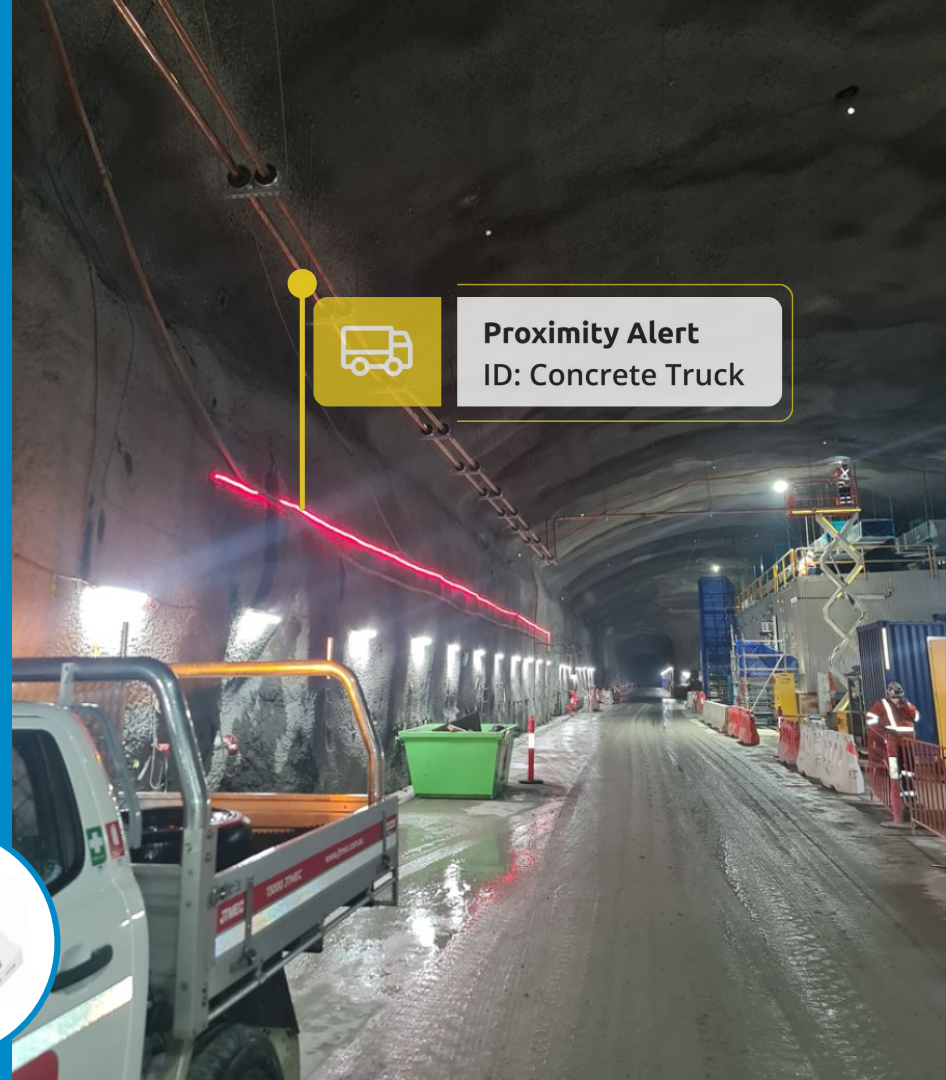
Personnel safety wherever they are. Users can initiate a distress call direct from the Tag. A users location, ID and distress call are instantly delivered to designated safety officials.

Duress Button



**NOTE:** ID Card Tag chosen as opposed to V7 Tag

## Graded Emergency Lighting

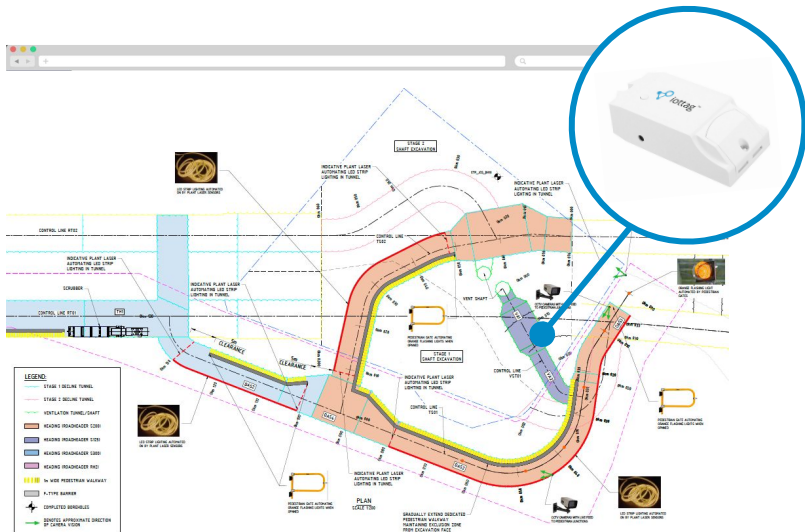
[illegible]



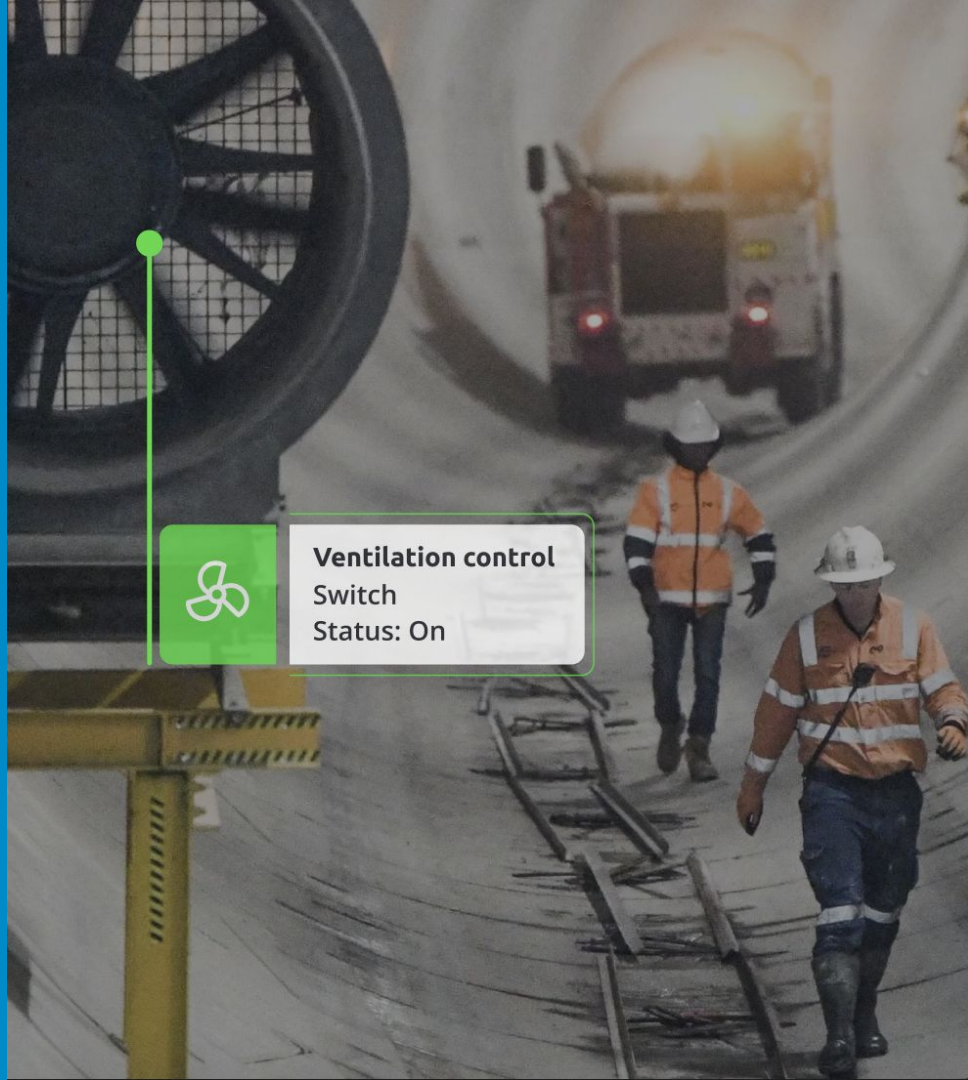
## AIR QUALITY MANAGEMENT

# Control Ventilation

Increase ventilation to suitable levels for improved airflow and reduced particle density.

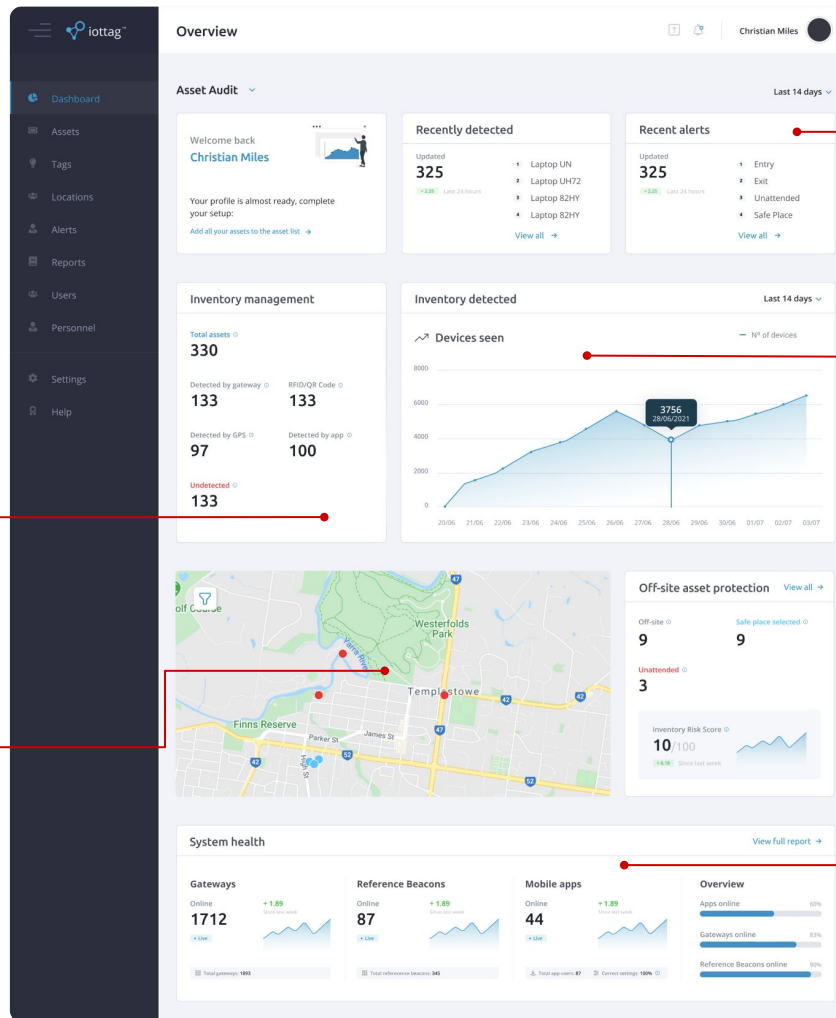


**Ventilation control**  
Switch  
Status: On



**Meaningful data at a glance**  
Collaborative data driven decisions made easy

# Personnel Activity Dashboard



Alerts summary

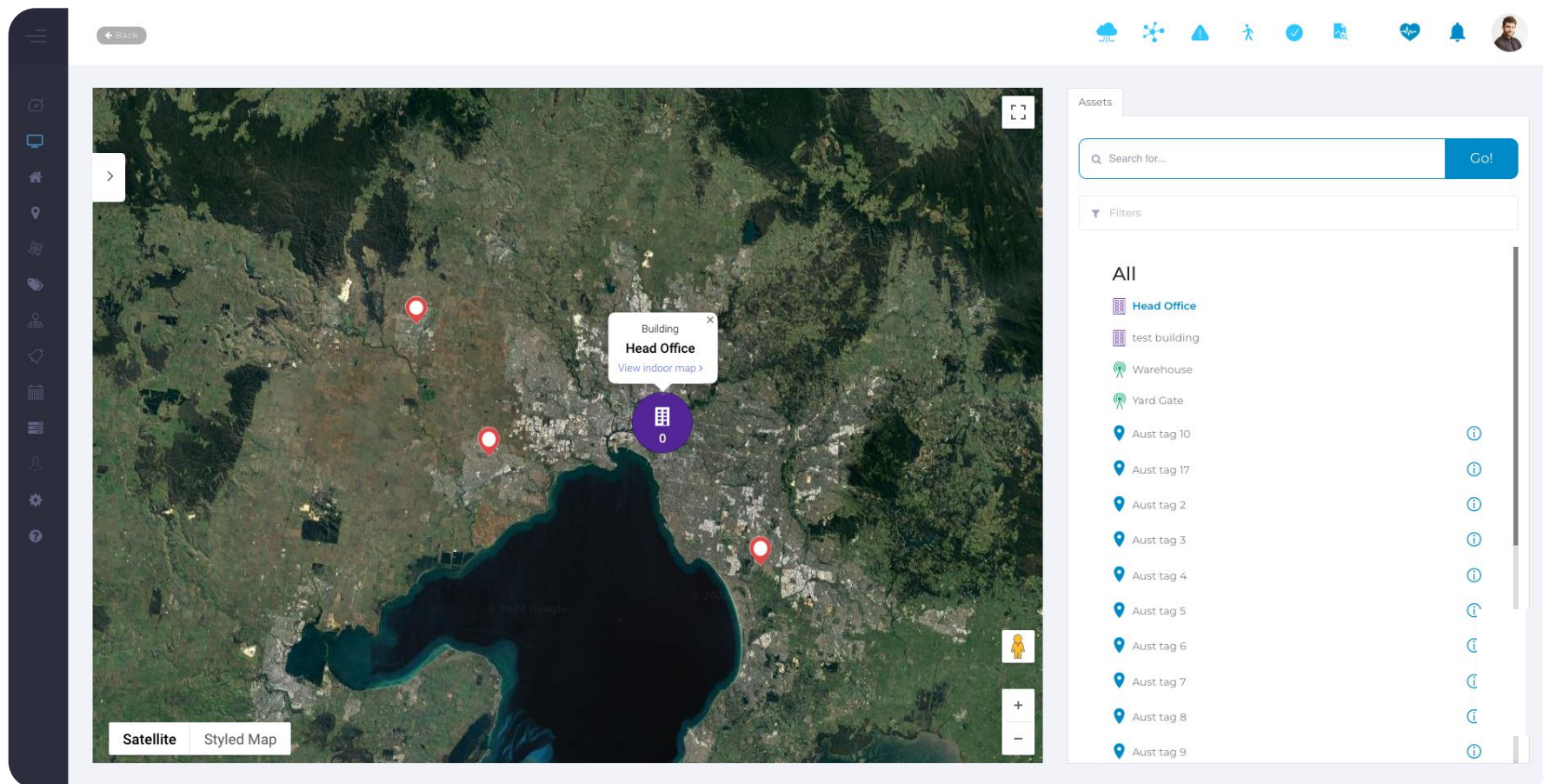
Summary of active personnel on-site

Total workforce tally

Spread of personnel by location

System Health overview

## Distribution of tagged assets geographically



- High accuracy customisable zones
- Filter by location and personnel ID
- Prevent personnel entering restricted access areas
- Monitor muster point occupancy
- On the ground and boardroom display options

Back

Indoor Tracking

Indoor Tracking

Dwell Time

Zone Alerts

Location History

Heatmap

ML Insight

System Health

M6 Map

C1

+

-

3

12

0

0

0

0

0

0

XPM01

XPM02

XPM03

XPM04

XPM05

XPM06

YDM07

C1 : In - C1 - XP04 M110S H Section

Tim McGuire | In range for 6 minutes

In - C1 - XP05 M120 (0)

In - C1 - XP10 M110S (0)

In - C1 - XP06 M110S (0)

In - C1 - XP04 M110S H Section (1)

In - C1 - XP12 M110 (1)

In - C1 - Shaft Portal (0)

Out - C1 - Shed B (0)

Out - C1 - Office (12)

Out - C1 - Workshop Arncliffe (1)

In - C1 - North Tunnel H section (0)

Out - C1 - North Decline (3)

Muster Point 1

refresh:

5 minutes

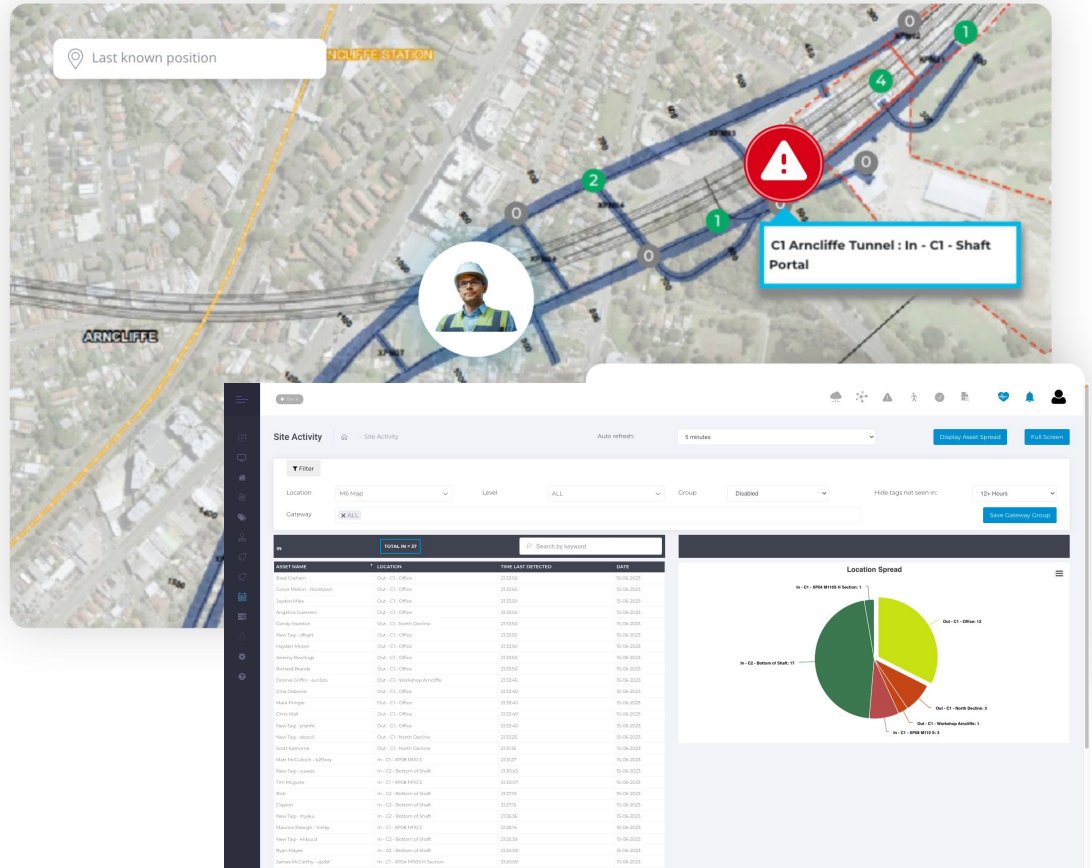
Hide tags not seen in:






12+ Hours

## Muster Point Tracking

Via the map-based interface, the application allows a user to view the status of evacuation and trigger alarms, as well as monitor Muster Point activity.

## Newmont: Touchscreen tablet chosen to support respective application data



-  SURFACE B (4)
-  SURFACE (32)
-  TUNNEL ENTRY (1)
-  Cavern (3)
-  Turnback (4)

Hunter Street Station : TUNNEL ENTRY  
Craig Melham | In range for 2 minutes

- Customisable geo-fenced spaces underground
- Monitor any asset via colour code zonal detection
- Heads up display of activity per zone
- Intuitive layered view by cross section

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## Asset Management

[- Asset Management](#)[Import](#)[Sample CSV](#)[Export CSV](#)[List](#)[Map](#)[Action](#)[Go!](#)[Filter](#)[Reset](#)Auto Refresh: ☐**87**

Updated In Past 24 Hours

[+ Add Asset](#)

<input type="checkbox"/>	Asset Name	Category	Linked Tag	Linked Gps	Note	Status	Updated by	Location	Updated Time	+ History	Last data	Action
<input type="checkbox"/>	Candy Stainton	Dayworks	d4p6lq	-	Peggy	In Range	Out - C1 - North Decline	-33.937840527591334, 151.14722636507935	2023/06/15 21:09:18		Gateway	 
<input type="checkbox"/>	New Tag - doocx1	-	-	-	-	In Range	Out - C1 - North Decline	-33.937840527591334, 151.14722636507935	2023/06/15 21:09:18		Gateway	 
<input type="checkbox"/>	Taylor Savage	Staff	m1lnuq	-	Tunneller	In Range	Out - C2 - Office	-33.937840527591334, 151.14722636507935	2023/06/15 21:09:16		Gateway	 
<input type="checkbox"/>	Gina Osborne	Excavation	vocykh	-	-	In Range	Out - C1 - Office	-33.937840527591334, 151.14722636507935	2023/06/15 21:09:16		Gateway	 
<input type="checkbox"/>			3oo1to	-	-	In Range	Out - C1 - Office	-33.937840527591334, 151.14722636507935	2023/06/15 21:09:16		Gateway	 
<input type="checkbox"/>			ufpwip	-	-	In Range	Out - C1 - Office	-33.937840527591334, 151.14722636507935	2023/06/15 21:09:16		Gateway	 
<input type="checkbox"/>	Jayden Mika	Excavation	ydnru3	-	-	In Range	Out - C1 - Office	-33.937840527591334, 151.14722636507935	2023/06/15 21:09:16		Gateway	 

Asset and Personnel group management tools. Real-time critical data and custom business rules configuration.

723

Total Tags

3.01

Average LifeTime (years)

15 %

Checkedin last 30 days

Company Name

CPB Contractors

Tag Model:

Vector

Maintenance Forecast:

☒ All (723 tags)☐ Short Term (0 tags)☐ Medium Term (21 tags)☐ Long Term (108 tags)☐ Never On (594 tags)

## Active Tag's

Jeremy Rowlings - E61E32D83A9C  
Jeremy Rowlings - E61E32D83A9C (expected)  
Tim McGuire - C676388CA8AD  
Tim McGuire - C676388CA8AD (expected)  
Richard Brands - DE7F172C0CA7  
Richard Brands - DE7F172C0CA7 (expected)  
Shaun - D1C8D88E58B7  
Shaun - D1C8D88E58B7 (expected)  
Scott Eathorne - EFE3D474A6AB  
Scott Eathorne - EFE3D474A6AB (expected)  
Ben Richards - D5FCE73E6189  
Ben Richards - D5FCE73E6189 (expected)  
Conor Leyden - EB7C2A940F4E  
Conor Leyden - EB7C2A940F4E (expected)  
Bond Toomalatai - FA255604ADEA  
Bond Toomalatai - FA255604ADEA (expected)  
Donnie Griffin - evn3cb - CAD40A1518C3  
Donnie Griffin - evn3cb - CAD40A1518C3 (expected)  
Myles Fitzpatrick - hbtgn9 - D3188DCA9ACC



System health management and reporting.  
Battery health forecasting for preventive  
and planned maintenance.

[← Back](#)

## Site Activity

[Home](#) - Site Activity

Auto refresh:

5 minutes

[Display Asset Spread](#)[Full Screen](#)

Filter

Location

M6 Map

Level

ALL

Group

Disabled

Hide tags not seen in:

12+ Hours

Gateway

X ALL

[Save Gateway Group](#)

IN

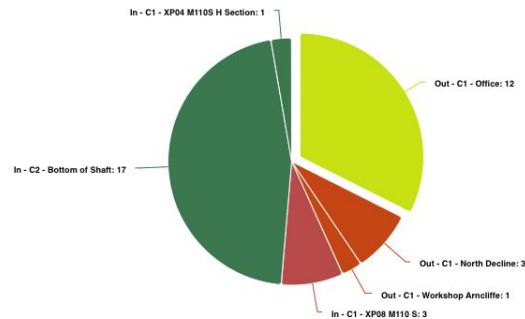
TOTAL IN = 37

Search by keyword

ASSET NAME	LOCATION	TIME LAST DETECTED	DATE
Brad Graham	Out - C1 - Office	21:33:50	15-06-2023
Conor Mellon - Rocktown	Out - C1 - Office	21:33:50	15-06-2023
Jayden Mika	Out - C1 - Office	21:33:50	15-06-2023
Angelica Guerrero	Out - C1 - Office	21:33:50	15-06-2023
Candy Stainton	Out - C1 - North Decline	21:33:50	15-06-2023
New Tag - dRgRt	Out - C1 - Office	21:33:50	15-06-2023
Hayden Moore	Out - C1 - Office	21:33:50	15-06-2023
Jeremmy Rowlings	Out - C1 - Office	21:33:50	15-06-2023
Richard Brands	Out - C1 - Office	21:33:50	15-06-2023
Donnie Griffin - evn3cb	Out - C1 - Workshop Arncliffe	21:33:45	15-06-2023
Gina Osborne	Out - C1 - Office	21:33:40	15-06-2023
Mark Pringle	Out - C1 - Office	21:33:40	15-06-2023
Chris Wall	Out - C1 - Office	21:33:40	15-06-2023
New Tag - ynshf4	Out - C1 - Office	21:33:40	15-06-2023
New Tag - dsooxl	Out - C1 - North Decline	21:33:25	15-06-2023
Scott Eathorne	Out - C1 - North Decline	21:31:35	15-06-2023
Matt McCulloch - k2f1wq	In - C1 - XP08 M110 S	21:31:27	15-06-2023
		21:30:43	15-06-2023
		21:30:07	15-06-2023
		21:27:19	15-06-2023
		21:27:15	15-06-2023
		21:26:36	15-06-2023
		21:26:14	15-06-2023
		21:25:39	15-06-2023
		21:24:00	15-06-2023
Ryan Mayes	In - C2 - Bottom of Shaft	21:20:59	15-06-2023
James McCarthy - vjo3sf	In - C1 - XP04 M110S H Section		

Versatile real-time zone based tracking, filter categories to isolate personnel, vehicle and location.

### Location Spread



## Duration and activity monitoring for assets

Start Date

Select date & time

End Date

Select date & time

🔍 Search...

Search

Reset

9

Total  
Tags

21907

Total  
Activations

85.62s

Average  
Activation Time

Company Name	Switch Name	Switch Mac	Gateway	Status	Updated By	Updated Time	Duration
Eastern Tunnelling Package	jcg	DA6374	AC233FC12742	● OFF	C3000004360D	2023-11-20 14:22:45	
Eastern Tunnelling Package	jcg	DA6374	AC233FC12742	● ON	C3000004360D	2023-11-20 14:22:33	12s
Eastern Tunnelling Package	jcg	DA6374	AC233FC12742	● OFF	C3000004360D	2023-11-20 14:21:13	
Eastern Tunnelling Package	jcg	DA6374	AC233FC12742	● ON	C3000004360D	2023-11-20 14:19:58	75s
Eastern Tunnelling Package	jcg	DA6374	AC233FC12742	● OFF	C3000004360D	2023-11-20 14:19:57	
Eastern Tunnelling Package	jcg	DA6374	AC233FC12742	● ON	C3000004360D	2023-11-20 14:19:52	5s
		DA6374	AC233FC12742	● OFF	C3000004360D	2023-11-20 14:15:58	
		DA6374	AC233FC12742	● ON	C3000004360D	2023-11-20 14:15:11	47s

Switch activity tracking delivers key data on activation and duration of each event.

## View Dwell Time of Personnel across site locations

### Dwell Time

Asset

Select Asset

Date Ranges

This Week

Yesterday

Today

One Day

Two Days

7 Days

Custom

Submit

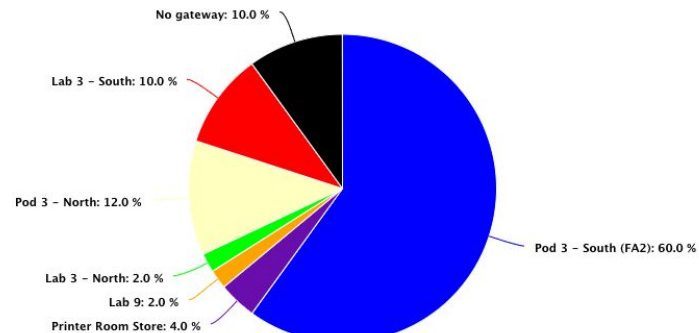
Reset

### Dwell Time data

Download CSV

Gateway Name	Total time	Percentage
Pod 3 - South	28 Hours 48 Mins	60%
Printer Room Store	1 Hour 55 Minutes	4%
Lab 9	0 Hour 58 Minutes	2%
Lab 3 - North	0 Hours 58 Minutes	2%
Pod 3 - North	5 Hour 45 Minutes	12%
Lab 3 - South	4 Hours 48 Minutes	10%
No Gateway	4 Hours 48 Minutes	10%

### Asset Dwell Time Summary



Floor

☐ Ground 0

0

# Measured utilisation unlocks performance insight



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- Dashboard
- Outdoor Map
- Indoor Map
- GPS Map
- Assets
- Tags
- Locations
- Alerts
- Insights
- Reports
- Users
- Settings
- Help

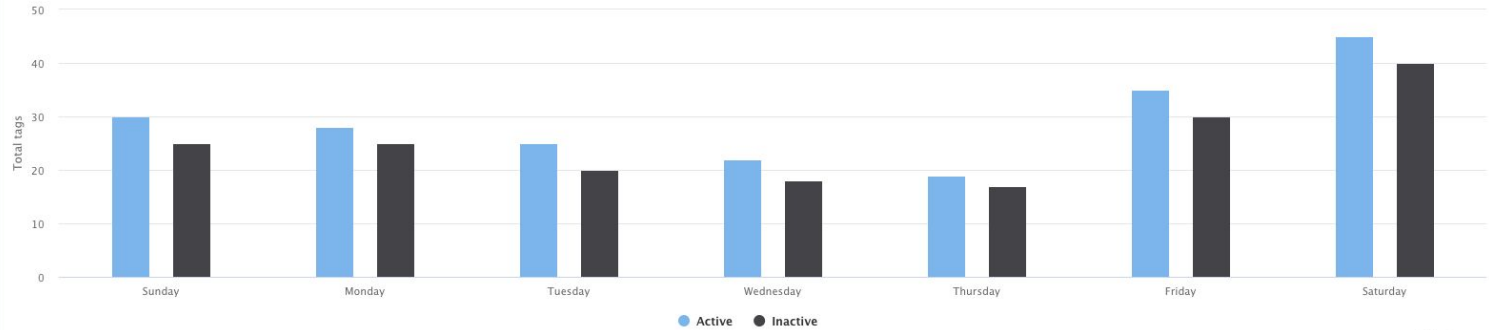
0 %

Today Active Assets

100 %

Today Inactive Assets

Asset Utilisation



Highcharts.com

Active

Search by keyword

ASSET NAME	TIME LAST DETECTED	DATE
------------	--------------------	------

Inactive

Search by keyword

ASSET NAME	TIME LAST DETECTED	DATE
------------	--------------------	------

Aust tag 1	10:16	07-11-2022
Aust tag 1	8:32	08-11-2022
Aust tag 1	16:55	09-11-2022
Aust tag 1	10:53	10-11-2022

## Configurable layered logic alerts & notifications across multiple channels

Dashboard

Outdoor Map

Indoor Map

GPS Map

Assets

Tags

Locations

Alerts

Insights

Reports

Users

Settings

Help

Edit Alert Details

×

GeneralAdvancedAccess Log

Trigger Type

Entry

Alert Name

Entry Alert

Apply rule for

Tag

Group

Time Zone

Australia/Sydney

Select Category

EquipmentTools

Select Gateway

Gateway 4Gateway 6Gateway 7

Notify Rule

Email

SMS

MMS

alerts@iottag.com.au

0411232132

Number 1

Email 3

Number 3

Number 3

Email 2

Number 2

Number 2

Email 4

Number 4

Number 4

MMS Image

Choose Image

Browse

Save

+ Add Alert

Section

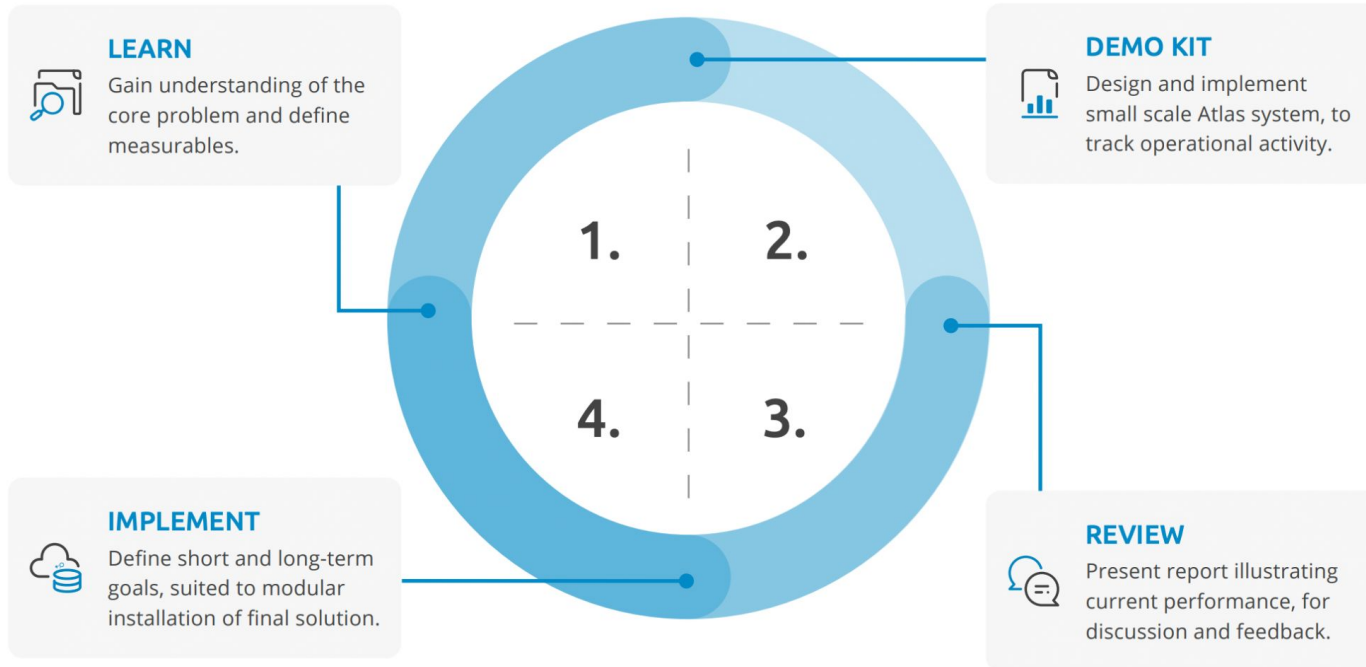
Previous

1

Next

# Our Process

A successful solution requires a measured approach

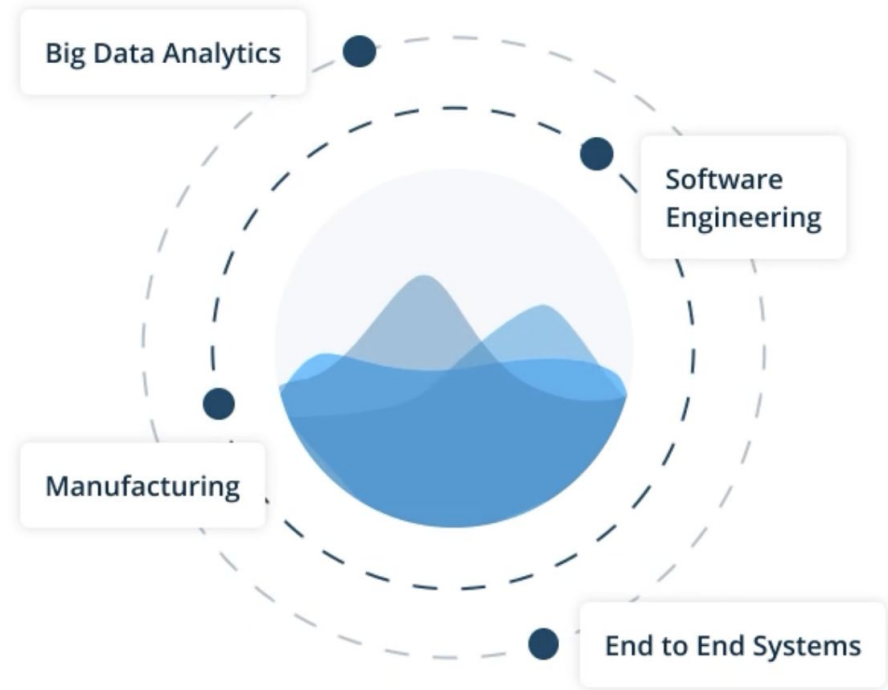


# World class systems capability

At iottag, our extensive expertise and globally recognized multi-disciplinary team are unparalleled in their ability to design, develop, manufacture, and support our proprietary software and hardware-enabled SaaS systems.

Our global presence is facilitated through advanced over-the-air management capabilities, ensuring proactive awareness and intervention for system events, thereby mitigating the risk of escalation.

We maintain the highest level of system control, to ensure maximum system availability and uphold a 99% uptime Service Level Agreement (SLA).



“We have found the IoT Tag team extremely willing to implement their system to suit our requirement. The hardware holds up well to our underground environment, while the cloud system enables, easy and high speed deployment to our across our projects. We continue to look at other innovations we can implement together, to continually improve site safety and efficiency.”

**Ben Richards (CPB Ghella JV)**

Sydney Metro Western Sydney Airport  
Station Boxes and Tunnelling Works



iottag supports CPB (JV's) on all four major underground tunnels in Australia total projects exceeding 7000 staff and 12bn in value (2023).

Global mining and tunneling companies rely on iottag systems

RioTinto

BHP



JOHN  
HOLLAND

**Atlas continuously audits asset  
behaviours to identify exceptions  
via Insight Reports**





# Newmont - The Problem Statement

Know who is underground, which areas of the mine they're in,  
and remove physical process of current tag board system.

# Iottag - The Solution

- A robust end-to-end solution for real-time tracking of personnel on foot and within vehicles traveling in excess of 20kph and carrying up to 15 personnel.
- Improved traffic flow through reduction in stoppage times across site enabled by wireless Tag ID detection and data display monitors.
- Dynamic site logic to determine accurate above and below the ground status via live application delivered reports.
- Muster point tracking to increase personnel safety during blasting activities.
- Strategically placed gateways with custom logic provide accurate location insight by zone with the ability to increase scale and respective tracking granularity, where required.
- Screens installed at tunnel entry, muster points, and office to serve pertinent presence and location information, filtered per zone or whole site visibility.
- Application insight reports generate on demand to provide field services and executive teams with live operational data and graphical visualisations.
- 24/7 System health monitoring, preventative maintenance and security patches. Enterprise grade, level 1-3 and emergency support package.

# Hardware - Fixed & mobile Infrastructure

Product Image	Product Name	Specification	Location	Volume	Price (AUD)
	IS1 Gateway	Fixed / Ruggedised	Front gate/office/tunnel entry/muster point	4	\$325
	ID2 Card	Mobile / Low profile	Site Wide	300	\$45
	T3 Vehicle Tag	Fixed / Ruggedised	Vehicle	50	\$59
	Samsung galaxy tab active 3	Mobile	Muster Point	1	\$1,100
	55" Xtreme LCD Screen	Fixed / Ruggedised	Office / Tunnel entry / Muster point	3	\$10,499
	KF1600G IP67 Enclosure	Fixed / Ruggedised	Front gate/office/tunnel entry/muster point	4	\$97
	ID Card sleeve and belt clip	Mobile / Low profile	Site Wide	300	\$9



## LEADING EDGE

### Partner with iottag™

Unparalleled, world-leading solutions  
for above and below the ground.

- Turn-key solution.
- End-to-end system management.
- Contractors onboarding and compliance monitoring.
- Tags your personnel will want to wear.
- Best in class technology made in Australia.
- Robust systems and gold standard data security.
- 24/7 onboarding and support to all departments and contractors.
- Dedicated account manager, installation, technical support and OTA maintenance included with all systems.



## Global Installation & Support



### Installation & Support (Level 1-2)

Schneider Partner Network

[View a map of all our locations](#)

### Sales & Operations

Claire Collins

+44 782 791 9589 / [claire.c@iottag.com](mailto:claire.c@iottag.com)

### Support & Engineering (level3)

APAC / UK / EU / CA

# Recommendations

Dump area - Tracking

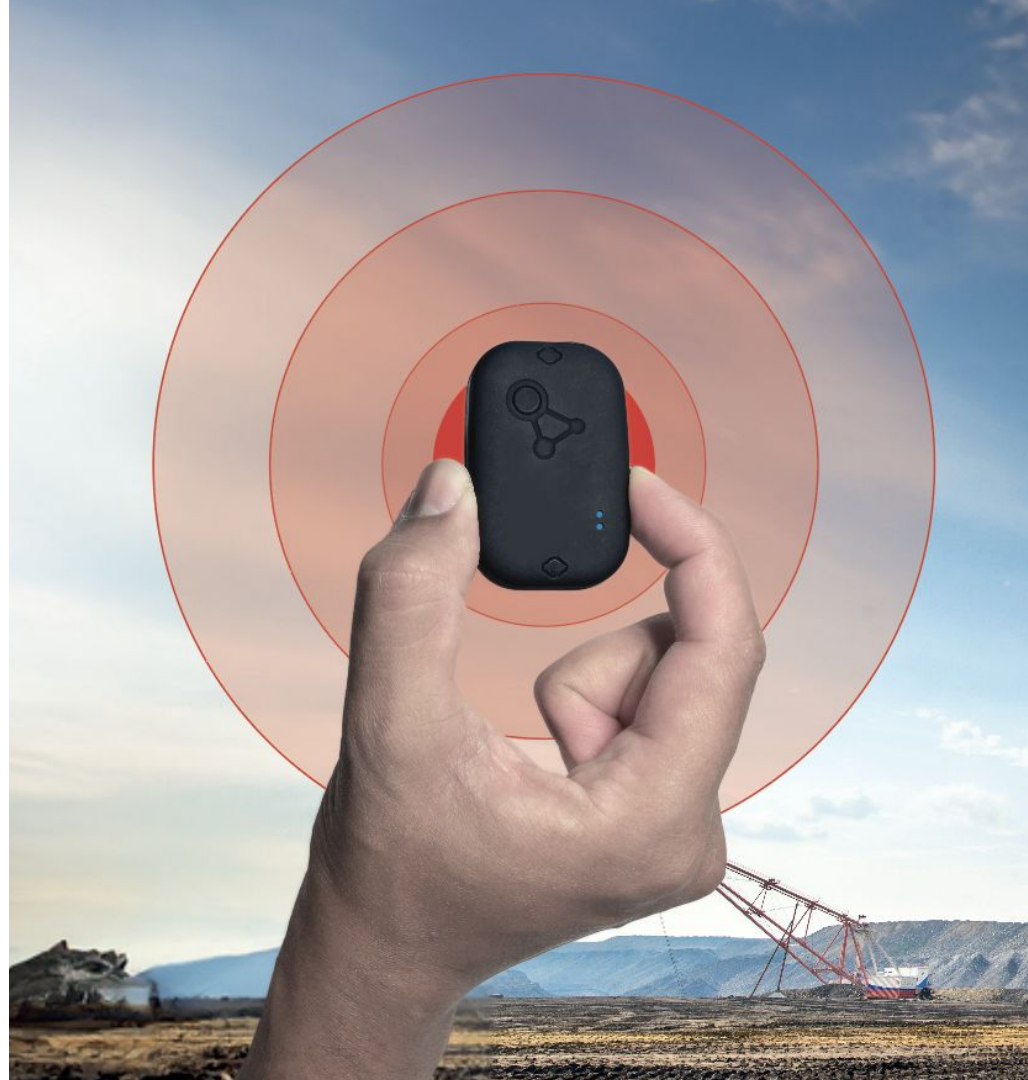
Detect Checkpoint A (access road)

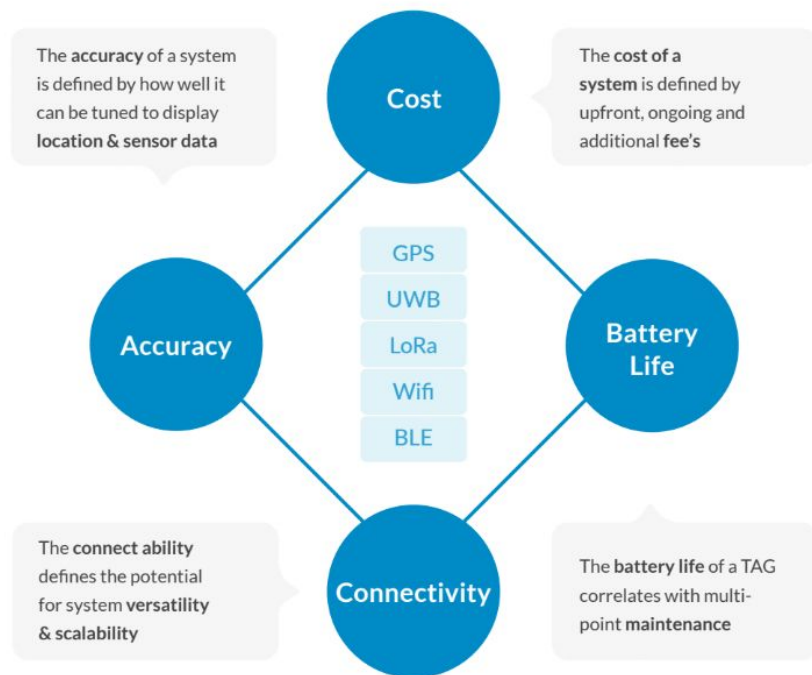
- > Heads up display of Vehicle & Personnel in range
- > Filter display data by 'checkpoint A'
- > Screen, -40c hood, robust outdoor (procure)

Detect Checkpoint B (carpark)

# Automated Personnel Tracking

- Personnel
- Vehicles
- Equipment





## Comparing real-time tracking technologies

Understanding the fundamental benefits of real-time tracking technologies promotes educated and solution oriented decision making. The diamond model serves to illustrate pillars of core criteria, which must find compatibility with the problem statement.

	Cost	Connectivity	Accuracy	Battery Life
GPS	High	Medium	Medium	Low
UWB	High	Low	High	Medium
LoRa	Medium	Low	Medium	High
Wifi	High	Medium	Low	Low
BLE	Low	High	Medium	High

By design active TAG's periodically transmit at their native frequency, each containing their own power source. The Atlas platform harnesses the power of all major technologies seamlessly.

# Cost Breakdown

BLE	Software Fee (monthly)			
Number of Assets	1-100	101-500	501-2k	2k+
Ongoing Costs	\$399 (flat fee)	\$3.25/tag	\$2/tag	Enterprise

**Need to adjust this table**

GPS	SIM & Software Fee (monthly)			
Number of Assets	1-100	101-500	501-2k	2k+
Ongoing Costs	\$16.25/tag	\$14.50/tag	\$13/tag	Enterprise

Minimum Cost of Problem = \$100,000

Maximum Cost of Problem = \$200,000

Estimated Cost of Solution (per annum) = \$30,000

Minimum ROI = 70%

Maximum ROI = 85%

### **Aim**

Know who's underground, which areas of the mine they're in, and remove physical process of current tag board system

### **Proposed Solution**

A robust end-to-end solution for real-time tracking of personnel on foot and within vehicles traveling in excess of 20kph and carrying up to 15 personnel.

Improved traffic flow through reduction in stoppage times across site enabled by wireless Tag ID detection and data display monitors.

Dynamic site logic to determine accurate above and below the ground status via live application delivered reports.

Muster point tracking to increase personnel safety during blasting activities.

Strategically placed gateways with custom logic will provide accurate location insight by zone with the ability to increase scale and respective tracking granularity as and where required.

Screens installed at tunnel entry, muster points, and office to serve pertinent real-time location information, filtered by zone or whole site visibility.

Application insight reports generate on demand to provide field services and management teams with live operational visualisations.

24/7 System health monitoring, preventative maintenance and security patches.

Enterprise level 1-3 and emergency support package.

## Controlled Evacuations

Initiate warnings and evacuation alerts direct to Personnel Tag (audio alarm and flashing lights) in real time. Via the map-based interface, the application allows a user to view the status of evacuation and trigger alarms, as well as monitor Muster Point activity.



Remote Activated  
Evacuation Alarm

