

POWERED BY
365mesh

greenmesh

Advanced IoT and Video Analytics for

Rail Safety and Operations

Continuous and rapid mobile deployment solutions for anytime, anywhere and always on monitoring

Advanced IoT and Video Analytics for Rail Safety, Security, Operations & Maintenance

Greenmesh Rail Safety and Operations is a complete end-to-end IoT solution developed in Australia for use within rail environments to improve safety and security, and to provide operational efficiencies to the rail industry. Greenmesh can provide a rail operator with the following benefits:

- **Level crossing safety** utilising advanced AI and IoT sensors with early warning detection to reduce level crossing safety incidents
- **Maintenance & Operations** to assist with monitoring and operational status of rolling stock and other track and rail assets
- **Security, theft & vandalism control** to detect and notify of unauthorised security threats or vandalism to existing railway locomotives or track side signs or theft of cargo associated rail assets
- **Train locomotive tracking & telematics** with fleet management to provide rich information relating to locomotive operations and real-time tracking of rolling stock and associated maintenance assets

Anywhere, Anytime Connectivity

- Ethernet
- LoRa
- Wifi
- Satellite
- IP
- MB-IoT
- 4G/5G

Managed Services Provider operating

24x7

Managed Services Provider operating 24 x 7 across Australia with NOC centres in Sydney & Melbourne

100% coverage

of earth's land and water surface areas

Rapidly Deployable Remote Solution

Greenmesh monitoring and detection solutions can be deployed anywhere with mobile trailers, cameras and sensors that can be mounted onto telescopic poles, vehicles and onsite depending on the railwork site's surroundings, level crossing architecture and/or assets.

These remote solutions are self powered and can operate on a completely separate network, so they won't impact any existing services or network.

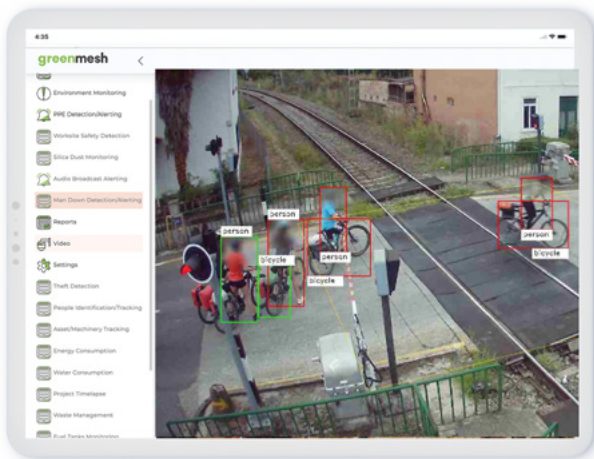
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Level Crossing Safety



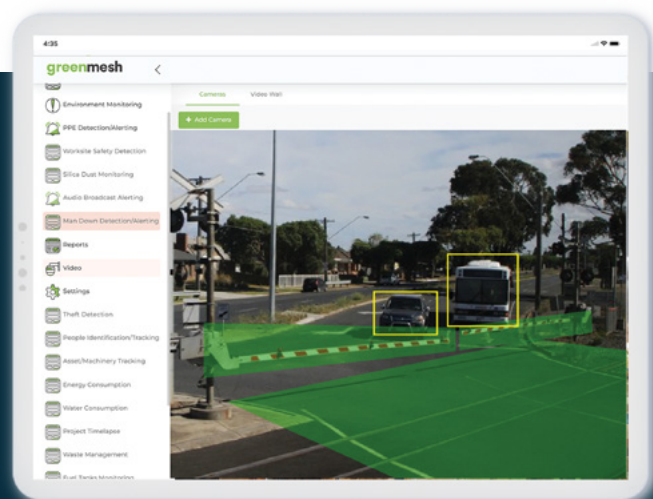


Greenmesh utilises advanced AI and machine learning, as well as purpose built sensors to monitor rail level crossing safety.



- ➔ Detect if a vehicle doesn't stop at a level crossing and if so then capture vehicle details including license plate.
- ➔ Capture footage of an approaching locomotive to verify if the locomotive forward facing lights are displaying correctly.

- ➔ Determine if there are any obstacles en route that could impact locomotive and provide early warning notification to driver and motorists
- ➔ Utilises advanced Ai architecture to monitor and predict near miss events before they happen.



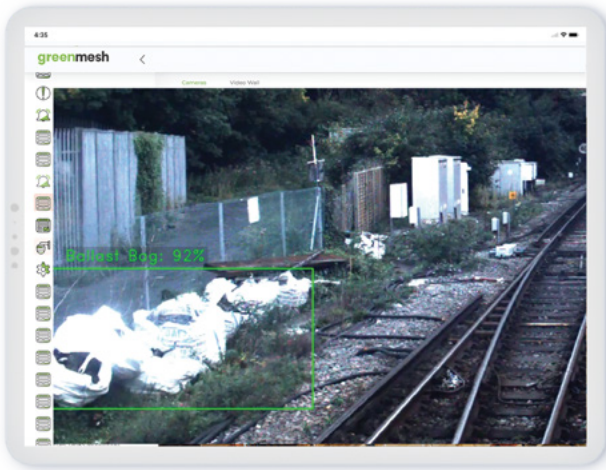
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Maintenance & Operations



Greenmesh is capable of aiding with maintenance and operations tasks by providing:

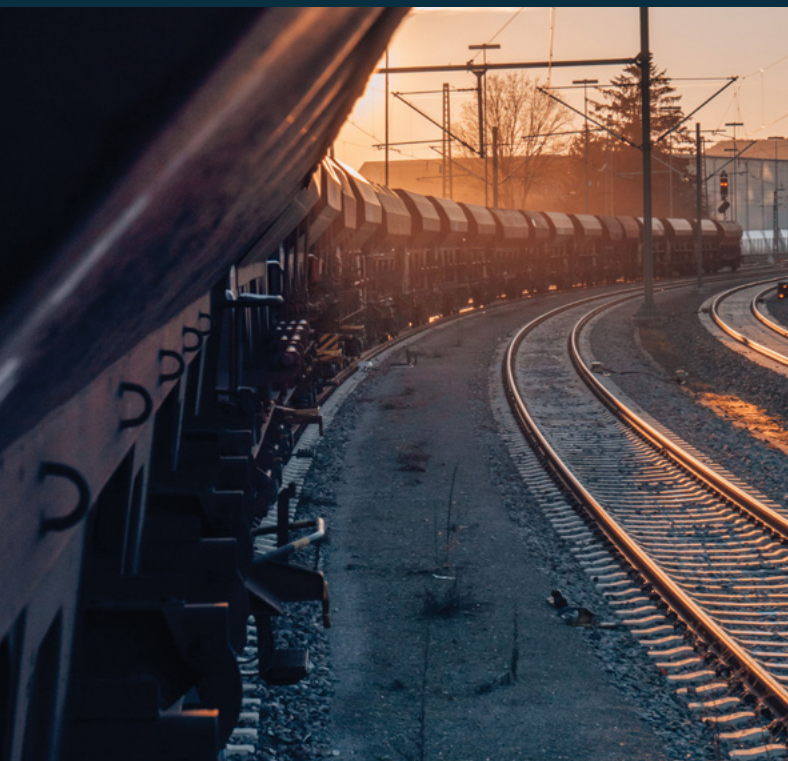


- Monitor on both sides of tracks and detect any illegal dumping or dumping of general discarded items such as litter, waste, trolleys, furniture, etc
- Monitor and detect animals on tracks or any other obstacles that could impede the safety of the locomotive
- Monitor for any damage or defects to train and trackside train assets, tracks, overhead lines etc

- Provide AI analytics on vegetation growth. This would be complimented with 365mesh remote sensing satellite imagery which would provide users with a heat map of the exact location where the pest plants and weeds are located



- Realtime information relating to racks and trackside assets conditions
- Monitor Cargo loads and help with determining load amounts (size/ volume / type of load - ie coal, sand etc) or count qty of logs loaded/unloaded and provide driver with a confirmation inventory digital ticket

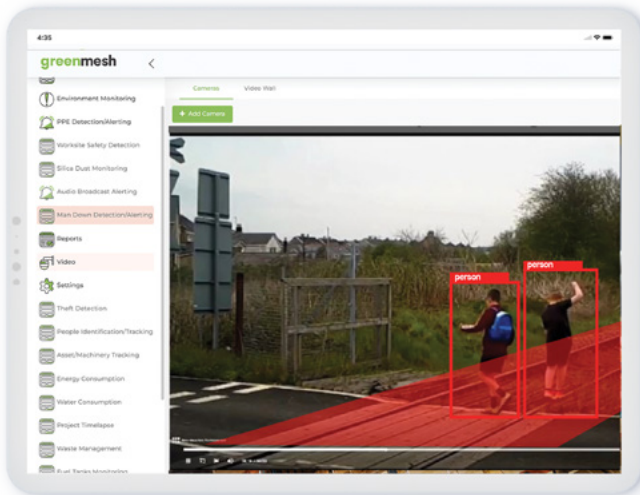


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broadsecure
**Security, theft
& vandalism
control**



Greenmesh's Broadsecure module can provide real-time information relating to security, theft detection & vandalism.



- Greenmesh utilises advanced AI for security, theft detection
- Detect vandalism of signs/assets
- Monitor for theft of cargo or other valuable assets/materials
- Monitor for after-hours theft or activity around the trains (this feature can be activated for different times of the day and can be turned on manually or switched off as required)

- Monitor for breaking glass or other similar noises within locomotives or surrounding trackside buildings
- Detect intruders, vehicles or wild animals inside unauthorised areas
- Monitor outbuildings and transformer or distribution boards / cabinets for intrusion detection and theft.

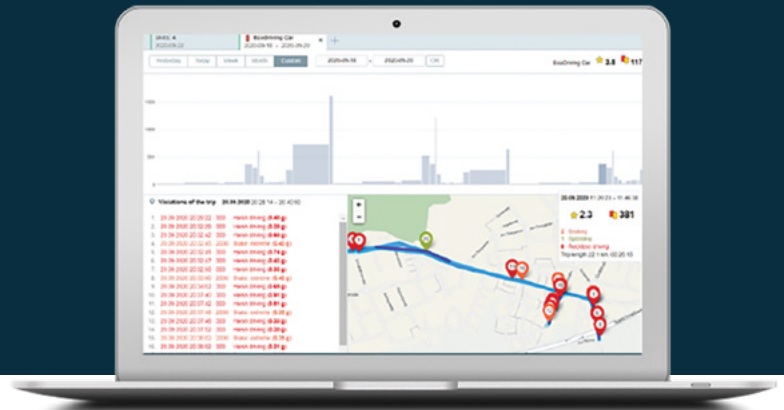


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Train Locomotive Telematics and fleet management

Greenmesh integrates with locomotives for Rich telematics and Fleet tracking & management to provide the following:



Provide real-time tracking of rolling stock (wagons/Locomotives and other mechanical and maintenance assets such as trailers or maintenance generators etc)



Provide counting information and provide the in-cab driver with safety data such as clean air and air working environment



Monitor for smoke and differentiate between air quality and atmospheric contaminants – Measures ambient temperature, humidity, pressure, various hazardous gases x 12



Provide time of day locomotive occupancy – Sends alerts to security if movement is detected after hours within the locomotive cab.



Measure light levels for both vision safety and also in the event that a light is left on after a certain time etc, (either send a notification to the relevant contact or the solution could switch the light off automatically)



Integration with vehicles for maintenance schedules/logs



Provides rollover detection and real-time alerting



Measure/alert on noise levels/thresholds for safe noise levels. Microphones are off and do not record, but has an AI built within that can recognise noises such as: **Windows breaking, Gunshots, People fighting and aggression.** These can be installed into outhouses and remote bathrooms and will report on counting/ environmental conditions but will also listen for running water if someone leaves the tap in the bathroom running.



Detects audible indicators of aggression, distress, damage, rowdy noise, running water (if tap is left turned on/alert)



Managed with cloud based browser based dashboards (view Anywhere/ any time) – Software does not need to be installed onto user's devices



Anti theft / Anti tamper proof: will alert if tampered with or removed



People Counting



Monitor temperature on tracks

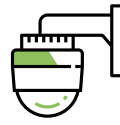


Monitor vibration on tracks and other assets

Other rail operations benefits include:



Greenmesh's Workplace safety rich AI capabilities and PPE detection solution aid's rail operators to reduce worksite incidents and fatalities by providing early detection and warnings of potential high risk accidents before they occur.



Greenmesh monitors for the correct use of protective equipment to help rail operators comply with industry health and safety standards, while also monitoring work habits to gain intelligent insights

The Greenmesh solution is a full end to end solution made up of hardware and software to improve rail safety at Rail level crossings. The greenmesh solution will provide deeper insights via sensors, AI and machine learning into various areas such as:



Rail safety at level crossings:

A multitude of algorithms to predict and reduce incidents before they occur.



Safety:

PPE monitoring and detect workplace unsafe conditions,



Safety:

Environment monitoring such as air quality and hazardous gases, silica dust , fire, unsafe smoke levels and other



Security:

Theft detection and identification/detection of unauthorised persons/vehicles within a specific zone/area



Monitoring and tracking of locomotives and other rolling stock assets



Provide real time analytics of speed correlation to track temperatures to ensure safe speeds and improved efficiencies

Use Cases **broadsecure**



Intelligent, cloud based video surveillance solution
With advanced AI/ML capabilities



Compatible with users' existing cameras
No need to replace cameras



Single dashboard with floor MAP
Shows all camera locations with one-click access to live video feeds



Streaming backup to cloud
Multiple storage durations for footage: 30, 60, 90, 120, 180 Days (custom)



Image Detection and Identification
Advanced AI/ML capabilities to accurately process and detect items off footage



Object Identification
AI capabilities to accurately identify objects



Animal Identification
AI capabilities to accurately identify species of animals



Identify and classify by people demographics
AI capabilities to identify age, gender, colour and type of clothing



Identify only people of interest
Protect the privacy of people outside the watch list with a no biometric data saving enabling option



Behavioural analysis capabilities
Manage and analyse people's behaviours to optimise standard operating procedures



Allow Motion Search
Search and filter through a library of motions within specific area of interest in the video stream. Set an alert for any activity within a particular area of interests.



Face Search with integration into AD
Pull up a library of faces detected and select one to see all the times and dates of when they were identified in footage



Motion heat maps
View the way people or objects move around areas, including Push events/triggers



Person tracking based on facial or electronic tag Utilise tags and facial
Recognition to implement site safety monitoring and auto-mate time attendance



Create custom zones
Narrow down areas of interest on a field of view. Collect data and set up alerts that occur only within this zone



Create virtual fences and boundaries
Create landscape boundaries on a digital map and contain people/animals using tags



History View
View the history of data collected which updates every hour, up to 120 days



ONVIF compliant
Remotely control the cameras' zoom, focus etc



Real time camera surveillance
With intelligent detection directional pan, tilt and zoom capabilities



Share access
Send incident alerts to anyone via sms and email

Use Cases

1. Community Safety & Law Enforcement

Our Mobile CCTV and Video Surveillance System enhances community safety and support law enforcement outcomes. Through intelligent, rapidly deployable surveillance capabilities, the solution enables proactive deterrence of unlawful behaviour while providing high-quality, legally compliant evidence to support investigations. By combining AI-driven analytics, license plate recognition and high-performance imaging, cities can address priority concerns, such as hoon driving, illegal dumping and anti-social behaviour, with greater accuracy and operational efficiency.



Hoon Driving Detection & Speed Enforcement

- Detection of high-speed vehicles (up to 200 km/h)
- Multi-lane speed monitoring
- Direction detection
- Automatic License Plate Recognition (ALPR/ANPR)
- Radar-video fusion for improved accuracy
- Evidence capture for investigations

Illegal Dumping Surveillance

- Monitoring dumping hotspots
- Event-driven recording (motion-triggered)
- Zone-based alerts
- High-resolution forensic capture
- Covert or overt deployment options
- Rapid relocation to emerging dumping areas



Anti-Social Behaviour Monitoring

- Public space surveillance
- AI-based behaviour recognition
- Real-time alerts
- Motion heatmaps to identify activity patterns
- Advanced footage search for investigations

2. Traffic & Transport

Effective traffic monitoring plays an important role in improving road safety and supporting a city's ability to respond to issues, such as hoon driving and unsafe vehicle behaviour. Technologies such as vehicle detection, speed monitoring and automatic license plate recognition enable authorities to identify and track vehicles across multiple lanes and road environments. When combined with radar-video fusion and AI-powered analytics, these capabilities allow for accurate measurement of vehicle speed and direction, as well as reliable capture of licence plate data in real time. This provides high-quality evidence to support enforcement and investigations, while also helping the City better understand traffic activity in key areas and respond more effectively to community safety concerns.

Traffic Monitoring & Smart City Initiatives

- License plate capture 24/7
- Traffic flow monitoring
- Multi-lane vehicle detection
- Speed monitoring and enforcement
- Data collection for traffic management planning



3. Public Safety & Incident Response

Rapid incident detection and timely response are essential to maintaining public confidence and safety. The Broadsecure platform enables real-time monitoring, event-driven alerts and secure evidence capture, ensuring that incidents are identified quickly and managed effectively. With cloud-based access, advanced search capabilities and extended retention policies, Council personnel can efficiently review, retrieve and share footage



while maintaining compliance with relevant legislation and cyber security standards.

Real-Time Remote Surveillance

- Live camera monitoring
- Real-time incident alerts
- Remote access via cloud platform
- Rapid deployment to emerging risk areas

Event-Based Recording & Incident Review

- Motion-triggered recording
- Time-lapse recording
- Reduced storage and bandwidth consumption
- Fast evidence retrieval using advanced search

Investigations & Evidence Management

- High-quality day/night imaging with IR
- Secure Australian-hosted cloud storage
- Retention exceeding 45 days
- Compliance with Surveillance Devices Act
- AI-assisted search and tracking of people, vehicles, and objects

4. Environmental & Infrastructure Monitoring

Protecting public spaces, infrastructure and environmental assets requires surveillance systems that can operate reliably across a wide range of locations and conditions. Cameras used for these purposes must be durable, weatherproof and resistant to vandalism to ensure consistent performance in outdoor environments. Flexible deployment options allow cameras to be installed either as fixed infrastructure or relocated as operational needs change. In addition, multiple power options such as solar, battery and mains supply enable monitoring in both urban and remote areas, including locations where

traditional power sources may not be available. This flexibility ensures continuous and reliable surveillance regardless of environmental or site constraints.

Environmental Surveillance

- Monitoring public areas and infrastructure
- Weatherproof and vandal-resistant deployment
- Off-grid capability (solar/battery)

Monitoring Key Infrastructure

- Fixed and mobile camera deployments
- PTZ and panoramic monitoring
- Edge AI processing in low-connectivity areas

5. Operational & Deployment

Flexibility and rapid deployment are important for responding to changing operational needs across a city. Surveillance systems that can be easily relocated or installed in different environments allow Council to address emerging issues and monitor priority areas more effectively. Mobile trailers, relocatable units and adaptable mounting options enable cameras to be positioned where they are most needed, whether for temporary events, construction sites, emerging hotspots or ongoing monitoring of infrastructure and public spaces. These deployments can be established quickly and supported through remote monitoring, diagnostics and maintenance capabilities, helping ensure reliable operation and minimise downtime.

Rapid Deployment / Temporary Surveillance

- Mobile CCTV trailers – Deployment at:
 - > Events
 - > Construction sites
 - > Traffic monitoring points
 - > Temporary high-risk areas
 - > Quick relocation capability
 - > Minimal setup time

Overt & Covert Surveillance Operations

- Flexible mounting options
- Custom brackets and enclosures
- Integration with existing infrastructure

Remote Asset Monitoring & Maintenance

- Remote health diagnostics
- Proactive maintenance alerts
- Edge computing for recording continuity



6. Advanced AI & Analytics

AI-powered analytics enable surveillance systems to do more than simply record video by turning captured footage into useful operational insights. Capabilities such as object detection, behaviour analysis, motion heatmapping and license plate recognition allow the system to identify relevant events and activities more accurately, reducing false alerts while improving the quality of evidence available for investigation. In addition, edge computing allows much of this analysis to occur directly on the camera or local device, which is particularly valuable in locations with limited connectivity. Processing data at the source reduces bandwidth usage, supports continuous recording and improves overall system efficiency.



AI-Based Object & Behaviour Recognition

- Person detection
- Vehicle detection
- Object tracking
- Behaviour analysis

License Plate Recognition (ALPR)

- Automated number plate capture
- Traffic and enforcement integration




PPE Compliance Detection

- Monitoring safety compliance (where applicable)

Motion Heatmaps

- Identify high-activity areas
- Support planning and deployment optimisation



**MONITOR.
DETECT.
ANALYSE.
AUTOMATE.**

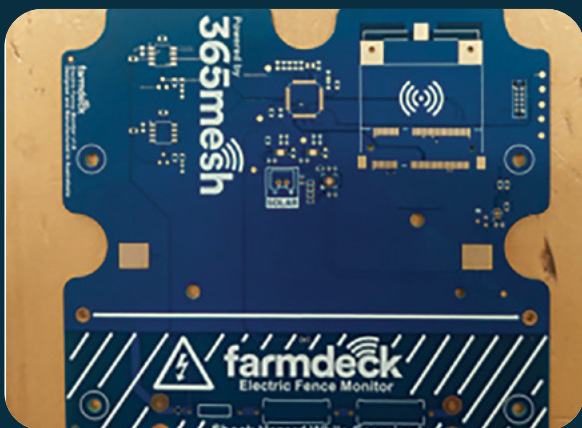
Your security is our priority.

Data collected from the sensors is owned by the customer and data is stored locally on customer premises with optional backup in the cloud.

Locally manufactured in Australia for fast shipping and local support

Rapid prototyping
Injection moulding
Assembly and shipping

Electronics PCB
Hardware testing
Manufactured by experienced engineers

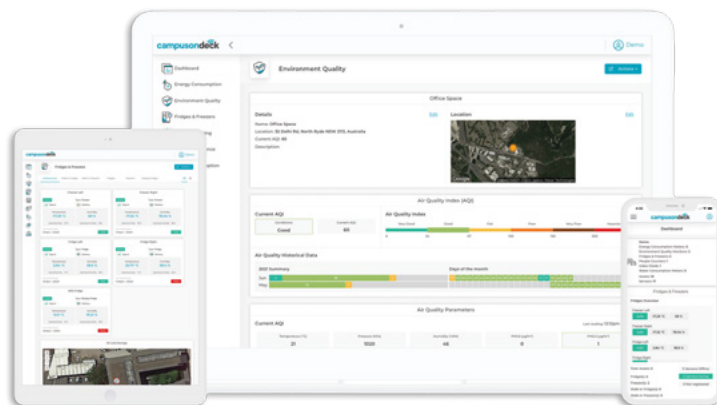


Managed Services Provider operating

24x7

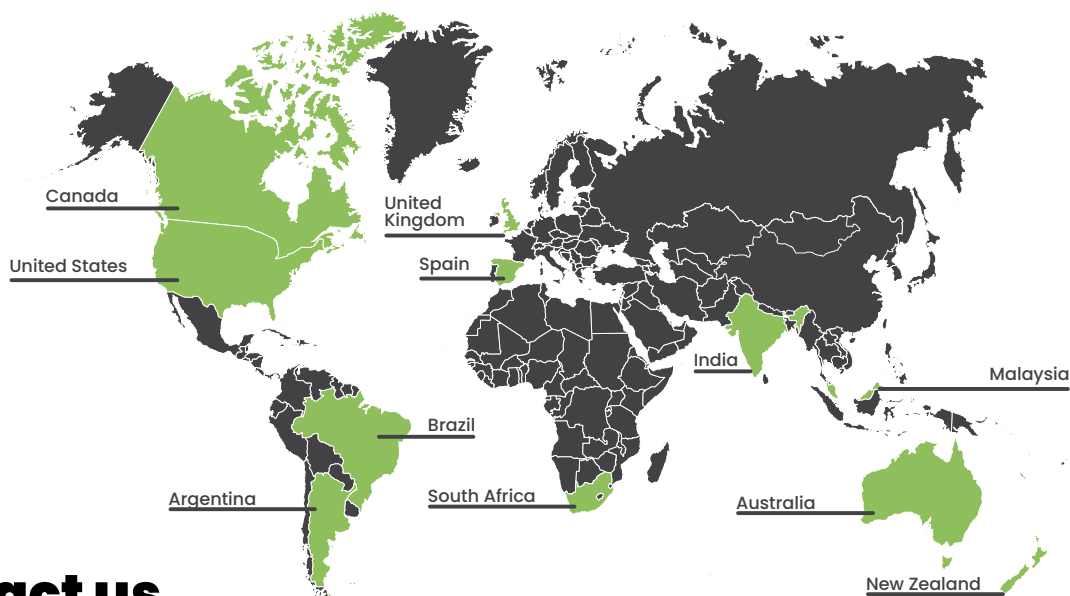
NOC (Network Operations Centre) in Sydney and Melbourne.

**Gain real time
visibility over your
railway operations
and projects with
365mesh IoT
portal.**



WE ARE FOUND GLOBALLY

Australian based, owned & operated with local manufacturing capabilities.



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POWERING 365mesh greenmesh broadsecure

outcomex

Greenmesh can be utilised in many industries

- Heavy machinery
- Earth moving
- Construction
- Mining
- Tunnelling and excavation
- Warehouse and factories
- Manufacturing
- Healthcare and Aged care
- Supermarket and Retail
- Ocean and Marine
- Airports
- Railways
- Transportation
- Cold storage Logistics