



# Baw Baw Shire Council

## The Baw Baw Information Network BBIN

Early detection, live conditions and visibility, proactive disaster mitigation, public health and safety and community resilience through the construction of a local intelligent integrated network.

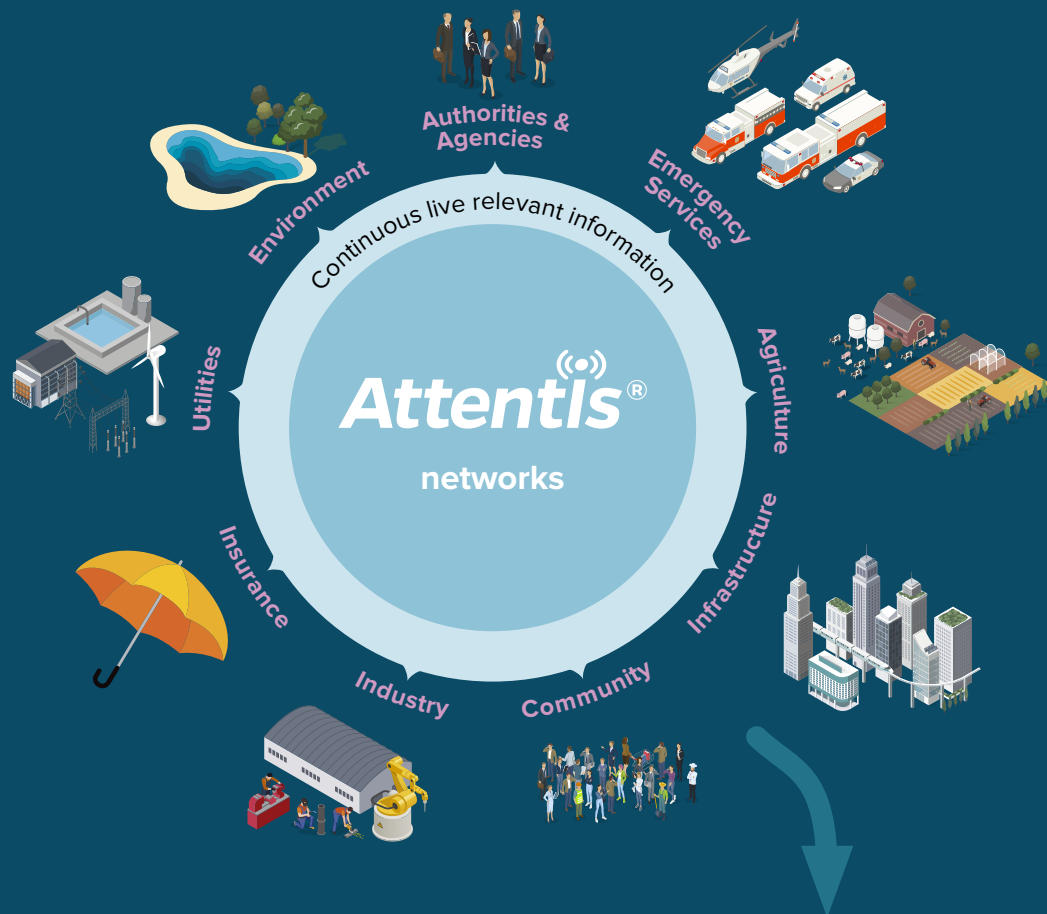
March 2022

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## A network to connect Baw Baw Shire



### Network features

- Early fire detection and notification
- Improved public safety and awareness
- Micro-climate weather information for local agriculture and viticulture
- Improved communication capabilities
- Remote access to high risk locations
- Monitors environmental impacts
- Delivers community resilience



Real-time monitoring



Local information



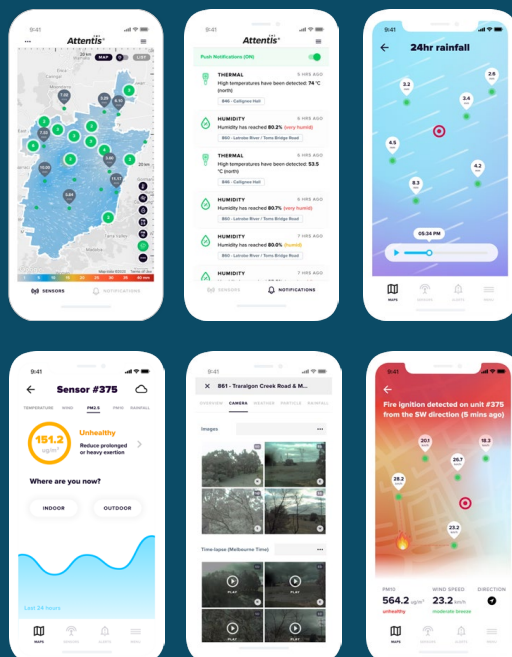
Improved understanding



Supports health and safety



An informed community



## The Baw Baw Information Network

Attentis® in conjunction with the Baw Baw Shire Council will construct a single, future expandable, intelligent local sensing network known as the Baw Baw Information Network.

The network will consist of six (6) fixed multi-sensor installations strategically located in the shire to deliver 24-hour monitoring of a range of environmental conditions.

The BBIN (network) as it will be known features key components including fire detection (performed in several ways), micro-climate weather, air quality, ground movement and bespoke sensing capabilities aligned to each individual location including thermal imaging and 360° cameras.

The network provides Emergency Services and local agencies with real-time access to each location to view conditions and images to support real-time awareness and response.

The networks are easily expanded to incorporate future sensing requirements and additional locations. This level of weather and environmental information supports local agriculture, forestry, tourism and viticulture industries.

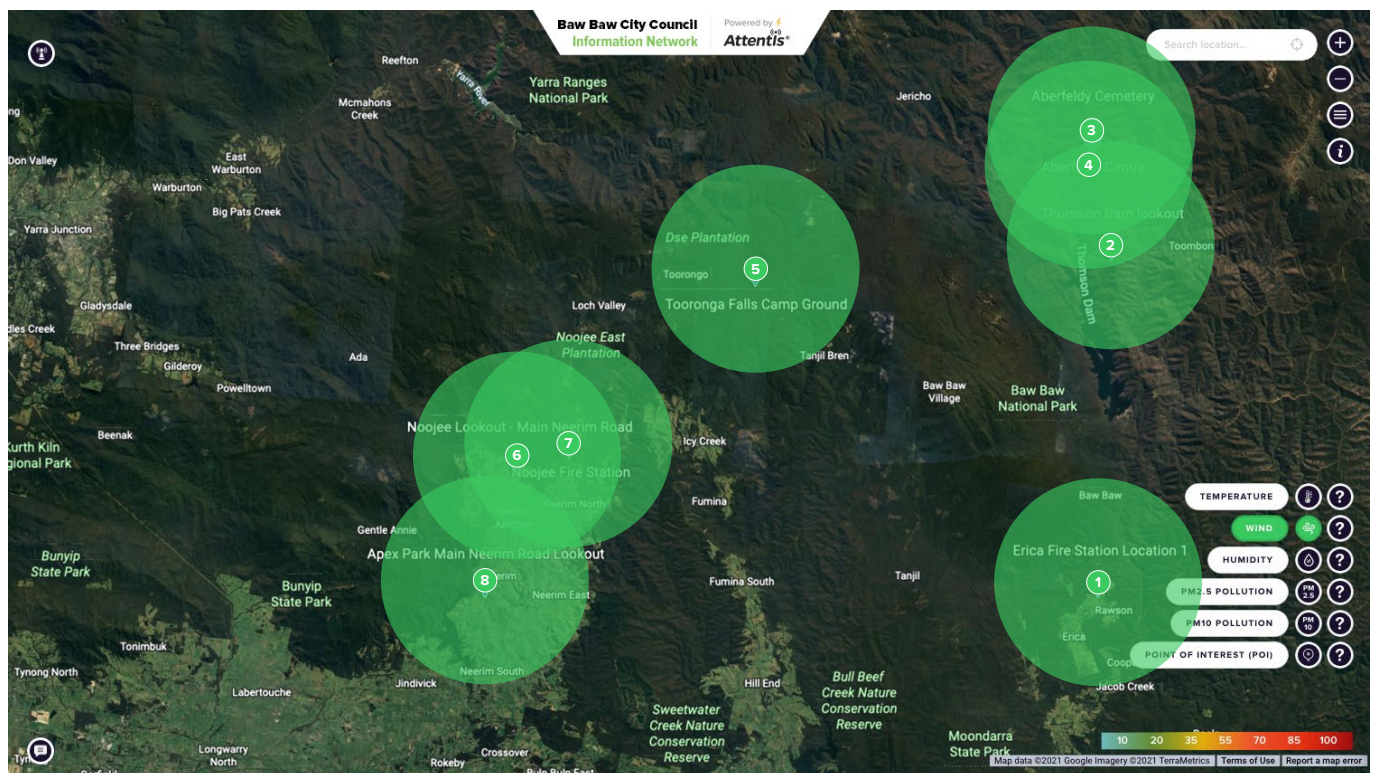
The network provides positive community interaction between the Baw Baw City Council and its residents by providing new levels of information, awareness and resilience.

### Proposed Multi-sensor locations

- #1 Erica Fire Station
- #2 Thomson Dam lookout
- #3 Aberfeldy Cemetery
- #4 Aberfeldy Centre
- #5 Toorong Falls Camp Ground
- #6 Noojee Fire Station
- #7 Main Neerim Road Lookout
- #8 Apex Park Roadside stop

Eight individual sites have been identified as key locations to view high risk fire ignition and fire movement in the shire.

Six of the eight identified sites will be selected by Baw Baw Shire stakeholders to determine the six final installation locations.





## Baw Baw Information Network locations – Proposed Site 1



### Erica Fire Station

The rear view from the Erica Fire Station provides an excellent lookout across the Unit to be installed on the rear roof or on a pole at the rear of the building.

This location was selected to view fire risk along one of the three main fire ridges. If a fire is present in the forest it will become visible from this location as it exits the forest.

This is a key location to view the north west of the Baw Baw region.





## Baw Baw Information Network locations – Proposed Site 2



### Thomson Dam road lookout

This location was selected for its view to the west and surrounds, providing early notification of the presence of fire in proximity to the Thomson Dam.

There are two locations for multi-sensor placement - 1 as pictured above, or 2 lower down the incline towards the water edge, via the access road on the right.

Position 1 provides the greatest view point, but could attract vandalism due to high visibility from the access road.



## Baw Baw Information Network locations – Proposed Site 3



### Aberfeldy Cemetery

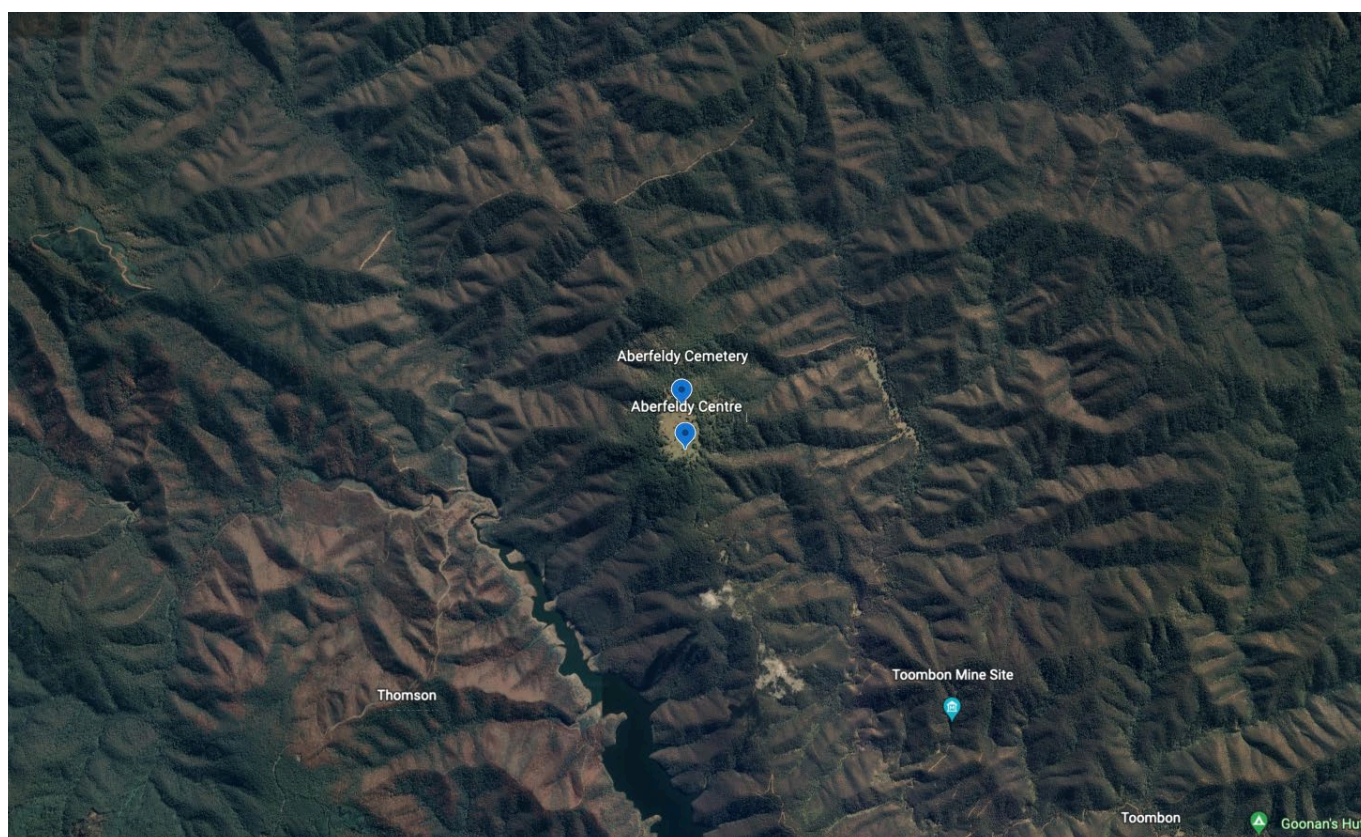
The Aberfeldy Cemetery is the furthestmost north location selected providing great views of Jerico. This particular location also features a local critical communications tower.

This location was selected to provide situational awareness to the remote population living in Aberfeldy and the surrounds that may have limited access to information. This tower maintains a 24-hour vigil providing a range of information for this small and relatively isolated community.





## Baw Baw Information Network locations – Proposed Site 4



### Aberfeldy Centre

The centre of Aberfeldy provides a clear view of the surrounding area to the east of the town towards Mt Useful. Although the population in this area is small, the ability to have clear views of the local conditions is a key element to the network, providing a north eastern aspect for the region.



## Baw Baw Information Network locations – Proposed Site 5



### Toorong Falls Camp ground at Noojee

Situated in a heavily wooded region of Noojee, visibility to the surrounds is limited. Located between two strips of forest, this location provides early notification of fire ignitions, wind speed and direction, access to cameras to view the number of people at the site and the ability to make informed decisions about travel access if a fire threat is present.

The Toorong Falls Camp Ground is a popular location with high fire risk from both sites, coupled with limited access - one road one road out - if there is a fire in the neighboring state forest, this location is extremely vulnerable with limited time to make decisions and safety leave the area. The installation of a multi-sensor at this location is an investment in early warning and live situational awareness for all campers and neighboring residents especially in Tanjil Wren.

The installation of a multi-sensor at this location also provides campers with the ability to view site congestion, conditions etc. before they attend.





## Baw Baw Information Network locations – Proposed Site 6



### Noojee CFA Fire Station

The Noojee CFA Fire station is located at a high point in the centre of Noojee and may represent a good location for a multi-sensor installation.

The multi-sensor can be either installed on the roof near the front fascia or at the rear of the property on the slightly elevated hill.





## Baw Baw Information Network locations – Proposed Site 7



### Main Neerim Road Lookout Noojee

Leaving Noojee and travelling towards Neerim South, the road incurs an uphill climb featuring a rest area half way up the hill. This lookout provides an ideal location for the installation of a multi-sensor due to its height and visibility looking back towards Noojee.

Installation of the pole behind the guard rail also provides protection for the multi-sensor installation.





## Baw Baw Information Network locations – Proposed Site 8



### Apex Park - road side stop

This location provides a vast view to the west of the region encompassing Tarago Reservoir, Bunyip State Park, Tarago State Forest and surrounds.

The installation will be a freestanding pole located left to the main picnic table area (not interfering with the view for roadside visitors) of Apex Park.





## Delivering 24-hour real-time information for the Baw Baw Community

### Live localised information

The BBIN features a designated user interface and App to enable residents and visitors 24-hour access to live weather conditions, air quality information and visual and thermal images throughout the network. Access is via a secured registration login. The BBIN will also feature access to the neighboring LVIN network.

### Instant notification

Registered users can establish threshold alerts to receive instant notification via email or SMS. Access to view images and conditions at the location provides new levels of situational awareness and personal safety.

### Monitoring

Attentis® will continuously monitor the BBIN to ensure all elements - multi-sensors, systems, interfaces and applications operate in unison through the lifecycle of the network. Its 'heartbeat technology' provides a complete technical diagnosis every 30 seconds.

### Hi-resolution visual and thermal imaging

The Attentis® R10 series multi-sensors provide real-time thermal and visual imaging to detect hot spots and changes in temperature that can identify areas of high risk. Each multi-sensor includes 360° visual access with time lapse video and still image recording from all units.

### Weather Proof

Attentis® sensors are constructed using a composition of fire, shock and UV resistant polymers and include multilayer protection.

This allows continuous operation even in the harshest conditions. Our wireless networks have also all been tested in extreme conditions to ensure reliability.

### Low-maintenance

All the materials and components used in the construction of our multi-sensors are selected to minimise maintenance. Any operational faults are transmitted to Attentis® administration for remote fault diagnosis and back-up system engagement.

### Daily information from around Baw Baw Shire

The BBIN serves the local community and visitors by providing the opportunity to actively view a local prior to attendance. Ideal to view conditions to ensure appropriate clothing, or congestion at camp sites, the network is designed to provide a new level of awareness, everyday.



## Intelligent, integrated, intuitive

R Series intelligent patented multi-sensors deliver 24-hour, unmanned, continuous measurement, edge data processing and live streaming of real-time integrated information; providing users a greater understanding of events and impacts as they unfold. Enhanced by artificial intelligence, R Series multi-sensors deliver unparalleled detection, notification, information and the ability to rapidly respond.



No trenching



No cabling



### Gases

Multiple air quality sensors detect and disseminate particles based on size and shape – PM 0.3, 1, 2.5, 10, CO, CO2, NO2, SO2 etc.



### Pollen

Type recognition through laser measurement of size and shape to detect and notify asthma sufferers



### Fire detection

Visible and non-visible flame recognition detection



### Weather

Ultrasonic measurement of barometric pressure, relative humidity, wind speed and direction, rainfall – detailed micro-climate weather World Meteorological Standards approved



### Thermal imaging / temperature

Measuring up to 80,000 individual points of surface temperature, delivered as individual readings



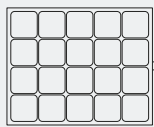
### Visual

Ultra high definition video and still imaging, image overlay technology



### Compact

15 x 30 cm in size



### Solar powered

Mains powered and 110V/240V. Portable plug pack units are also available



### Soil moisture

Self-powered, wireless communication, intelligent



### Vibration

Measured in multiple data formats to comply with all global standards



### Movement

Ground and structural movement (towers, bridges, buildings, structures, etc) to 0.1 of a degree via remote sensors



### Audio

Fine scale recording and playback via individual MP3 files



### Floods

Ultrasonic measurement of river depth and height in real-time



## Micro-climate weather

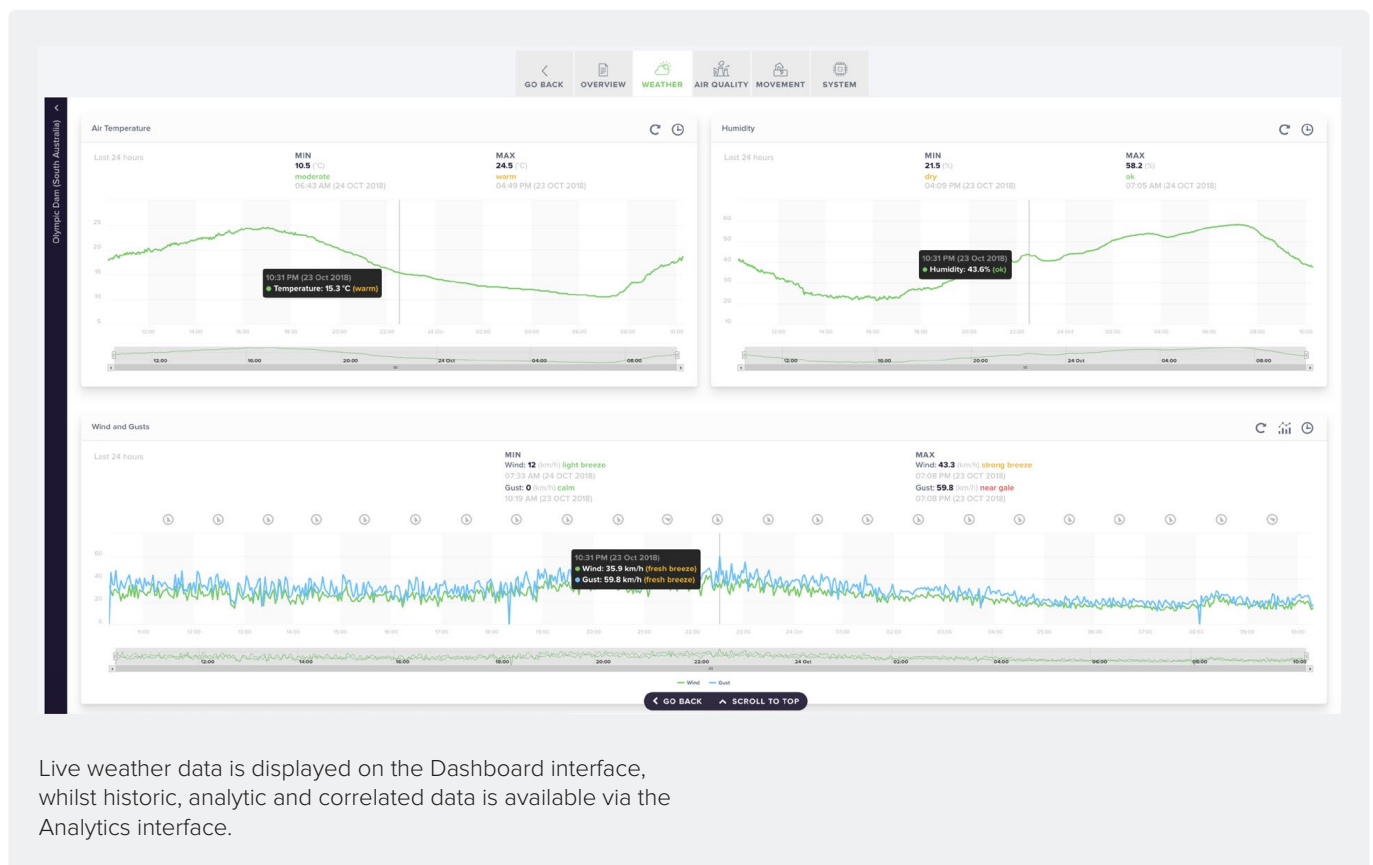
The BBIN will feature micro-climate weather sensors to enable accurate and improved understanding of conditions throughout the region.

Current weather intelligence is acceptable for macro decisions, however fine-scale, localised weather data is crucial to avoid unforeseeable outcomes.

The Attentis® R-series multi-sensors specified for the BBIN provide continuous, fine-scale, real-time weather information including wind speed, wind direction, temperature, relative humidity, barometric pressure and rainfall. Delta-T and Fire Danger Index calculations are also viewable.

Due to the multi-communication and high speed data transmission capabilities of Attentis® sensors, all information is displayed continuously to reveal micro-climate changes as they occur.

Attentis® weather sensors are WMO (World Meteorological Organisation) and BOM (Bureau of Meteorology) compliant for Tier 1 and Tier 2 applications and Australian Standards AS/NZS 3580.



Live weather data is displayed on the Dashboard interface, whilst historic, analytic and correlated data is available via the Analytics interface.



## Air quality monitoring

Working towards a cleaner, safer planet.

Measuring air composition is an important step in managing the health of our environment and provides a clear understanding of the long-term impact of air borne particulates.

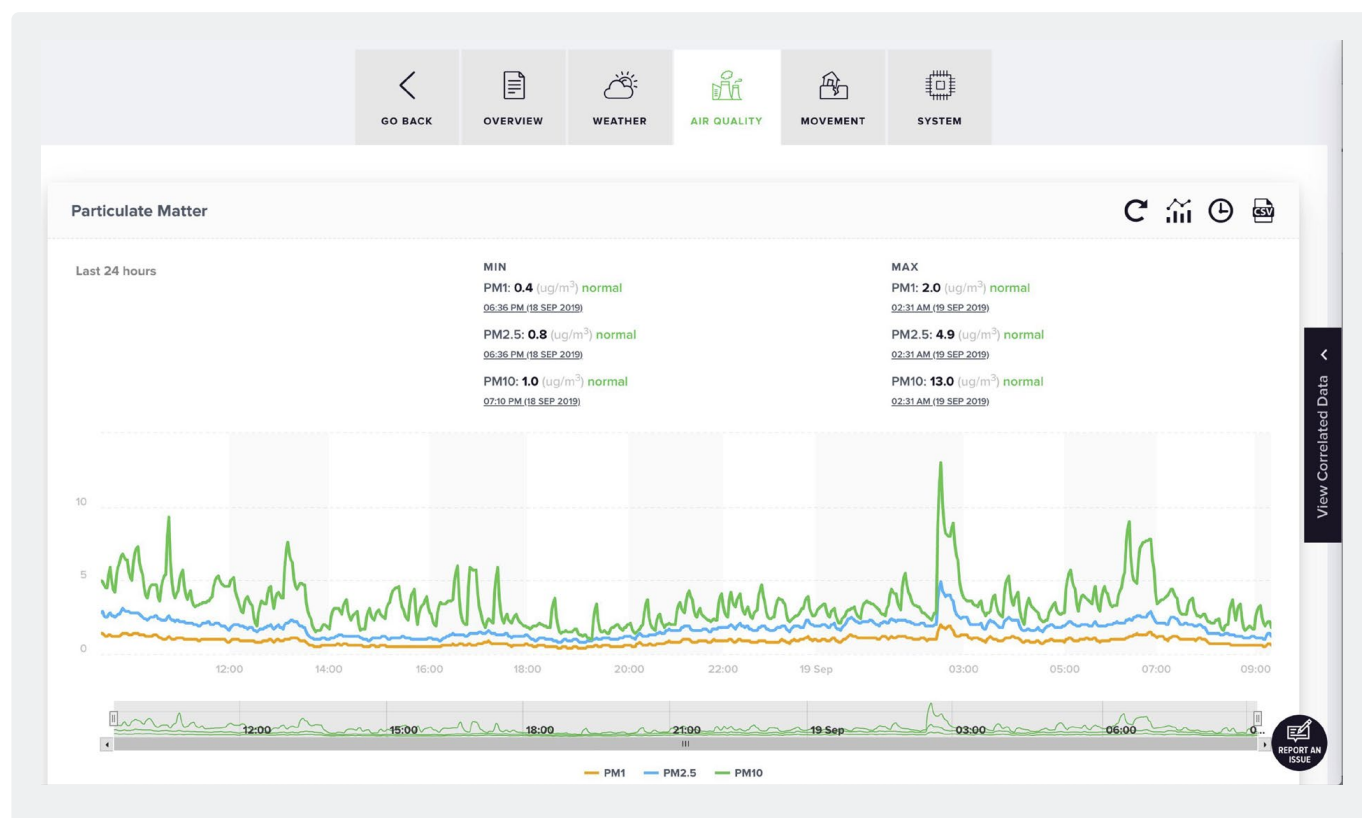
The R-series multi-sensors specified for the BBIN provide continuous fine-scale air quality measurements of PM<sub>1</sub>, PM<sub>2.5</sub>, PM<sub>10</sub>, Ozone, carbon dioxide and carbon monoxide, displayed in real-time and historically. Additional gas inclusions can be specified either prior to network construction or retro-fitted after construction.

PM<sub>1</sub> particulates are ultrafine particles including pollen.

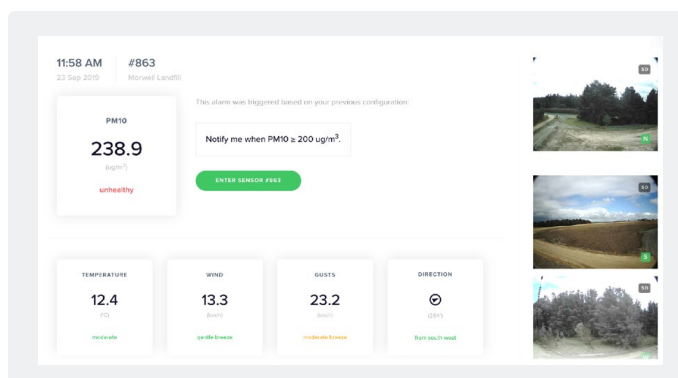
PM<sub>2.5</sub> are less than 2.5 micrometres and are responsible for impairing lung and heart functions.

PM<sub>10</sub> are large particles including dust and smoke.

Attentis® networks actively track live air movement, providing immediate notification of a threat, allowing mitigation measures to reduce the level of exposure.



Air quality alerts are transmitted via email and SMS revealing the reading, conditions and images at the time of the detection.

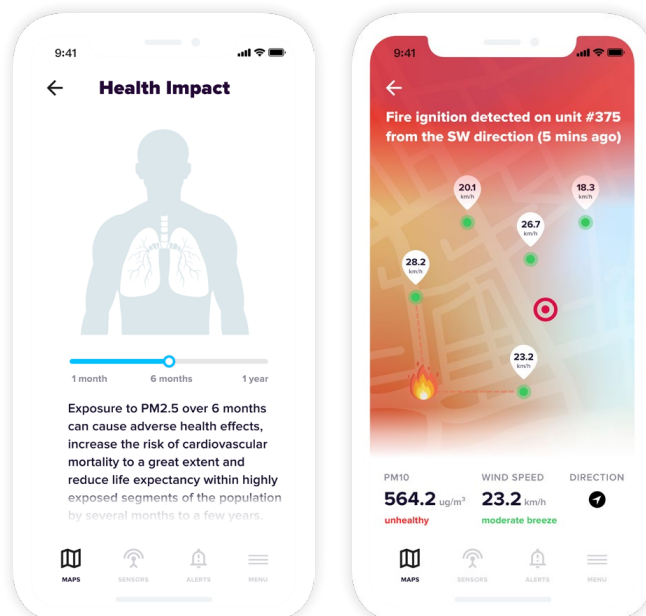






## Supporting public health

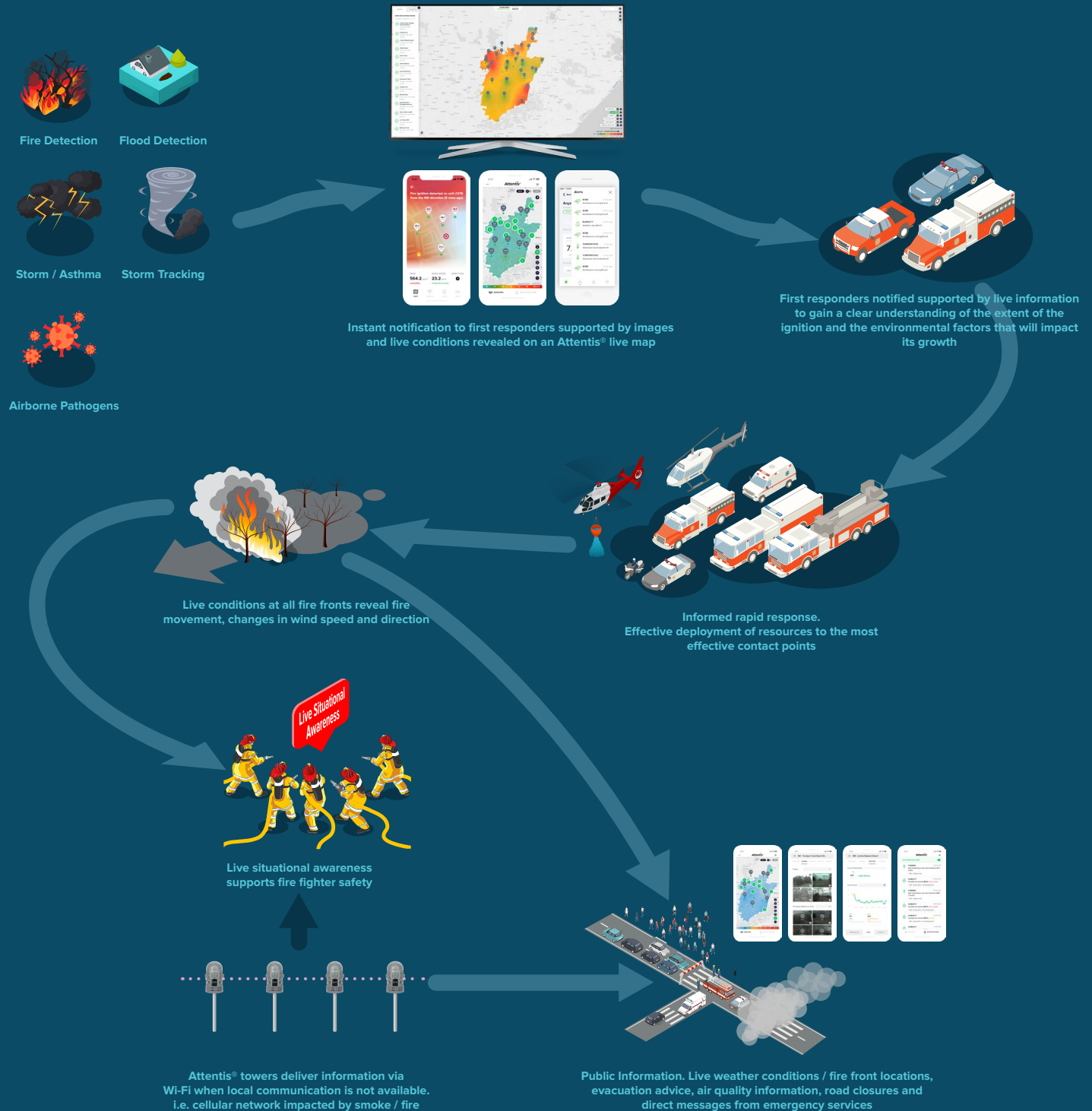
The App is a valuable tool for asthmatic individuals and those who experience respiratory ailments, providing a mobile platform featuring early warning of airborne pollutants including concentration levels, arrival time and safe routes to avoid exposure.





Attentis® technology is critical to the future of fire, flood and natural disaster management

Early detection, rapid response, and live situational awareness



Attentis® combines early detection, live information, tracking, notification and communication systems in a single high speed network.

The BBIN will be key in the future to support a resilient informed Baw Baw community.



## Instant detection and notification

The BBIN will feature 24-hour fire ignition detection with instant notification sent to local emergency services, first responders, Baw Baw City Council and Attentis®.

Notifications can also be forwarded to residents, via the Attentis® App and; Watch & Act notifications via Emergency Services and the Baw Baw City Council.

Attentis® pioneered and patented unmanned 24-hour instant detection through the creation of its R-series intelligent multi-sensors, providing 360° real-time thermal and visual imaging to detect fire starts, re-ignitions, hot spots, fire movement and changes in conditions.



**Thermal**



**Visual**

## Emergency services

The BBIN will provide an unparalleled level of real-time information to deliver live situational awareness and safety. Fire location, current conditions and personnel location are viewable on the Attentis® - BBIN interface and App.

Live intelligence of all factors to inform, improve response, reduce impact and provide better outcomes.

An invaluable tool to enable first responders to:

- rapidly respond with a clear understanding of the event as it unfolds;
- strategically position ground and aerial resources at the most effective locations;
- maintain real-time awareness of changes in wind speed and direction to stay ahead of the event;
- reduce the risk of burn over and health impacts to first responders by continuous tracking, personnel, conditions, the fire front and flood zones;
- measure air composition for smoke, particulates and gases and location to reduce health impact on first responders and the general public.





## Future network expansion and applications

The network can easily be expanded in the future to encompass other areas of high risk, critical infrastructure and locations that support local industries.

### Agriculture

The BBIN network provides an additional six (6) weather stations to the region supporting the existing Bureau of Meteorology (BoM) station at Mt Baw Baw. This additional micro-climate weather data supports local agriculture, forestry and industries. Fine-scale information including wind movement, air quality, soil moisture, frost, dew, fire danger index and delta T aid informed decision making and risk reduction.

Future expansion of the BBIN will introduce finer-scale information to support improved efficiencies, yield and mitigation across the region.



### Critical infrastructure and asset protection

The Aberfeldy Cemetery (communications tower) and the Thomson Dam proposed multi-sensor installation locations seek to protect key critical resources from fire risk, however further locations including the Noojee Trestle Bridge may also require monitoring in the future. The intention of the BBIN is to expand the network footprint in the future to ensure all high risk locations are monitored to improve critical resource, infrastructure protection, public health and safety.





## A complete solution

### Integrated Intelligent Informative

Attentis® designs and manufactures intelligent, patented, self-powered, multi-sensory devices that measure all factors throughout a city, region or state, delivering new levels of real-time and historic information providing insight for improved outcomes.



- 1 Air Quality**  
PM<sub>10</sub>, PM<sub>2.5</sub>, PM<sub>10</sub>, CO, CO<sub>2</sub>, O<sub>3</sub>, SO<sub>2</sub>, pollen, pollution, air and gas composition are continuously sampled and tracked across a location, region or state.
- 2 Mining**  
Miners are being required to adhere to increasingly rigid state and federal standards and protocols for environment management. These apply across all phases of mine life – exploration, development, extraction, processing and remediation.
- 3 Agriculture**  
Attentis® combines micro-climate weather, delta T, fire index, wind movements and air, water and soil composition to improve efficiency, maximise crop yield and detail factors that impact operations. Intelligent equipment automation, crop health monitoring and diagnosis systems assist in the prevention of spray drift and hazardous practices.
- 4 Livestock**  
Animal health monitoring, stock movement and tracking, and system automation improves efficiency, productivity, traceability and accountability.
- 5 Structural Integrity**  
Monitoring of vibration, tilt, sway, movement and material conditions in buildings, bridges, towers and structures.
- 6 Shipping Management**  
Foreign water testing (ballast water), smart goods tracking, ship movement and engine room detection systems.
- 7 Water Quality**  
Water composition and contaminant concentration levels in real-time and for historic comparative analysis.
- 8 Hazardous Conditions**  
Continuous measurement of radiation levels, gases and discharge materials from power stations, chemical plants and hazardous materials factories.
- 9 Public Safety**  
Real-time public notification of events, closures, warnings, threats and general public information.
- 10 Restricted Area Access**  
Controlled access to restricted areas combined with intruder detection in non-authorised locations.
- 11 Bushfire / Wildfire Detection**  
24 hour ignition detection from powerlines, substations, lightning strikes, accidental ignition and arson. Real-time fire movement tracking to enable effective resource deployment.
- 12 Electromagnetic Levels**  
Measurements of radiated energy from cell stations, radio, Wi-Fi and communication equipment and towers. Data speed monitoring to identify black spots for future upgrades.
- 13 Noise Monitoring**  
Multi-frequency audio monitoring in high traffic, venue and aviation locations.
- 14 Public Health Monitoring**  
Localised, microclimate and air quality conditions combined with wearable device data increases public health information in sport centres, parks and fields.
- 15 Item Location**  
Search of individual items in big surfaces e.g. warehouses and harbours.
- 16 Waste Management**  
Detection of rubbish levels to optimise garbage collection routines and routes.
- 17 Solar Irradiation**  
Incoming solar irradiance measurement, monitoring of regional solar network performance.
- 18 Vehicle & Asset Tracking**  
Real-time notifications of breakdown, theft or hazardous materials transport to enable rapid response to minimise risk, impacts and interruptions.
- 19 Water Infrastructure**  
Leak and pressure variation detection of pipelines, tanks, pressure vessels and valves.
- 20 Dam Wall Monitoring**  
Real-time integrity monitoring of dam walls.
- 21 Wind Farm Efficiency**  
Active tracking of wind movements throughout a region can be integrated into the operating system of wind farms to enable turbines to operate in accordance with available wind increasing efficiency and power generation capability.
- 22 Swing & Sag Monitoring**  
Swing and Sag of powerlines are monitored in real-time to detect powerline movement for both energized and de-energized powerlines.
- 23 River Heights & Health Monitoring**  
Real-time monitoring of river, stream, estuary, lagoon, water storage and pondage heights.

### Attentis delivers on







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Creating intelligent sensor networks is a major step in understanding environmental factors that impact our daily lives.

Attentis® Technology has invested years of research and development, testing our networks in extreme conditions to ensure reliability.

Attentis® intelligent networks transform life through improved human understanding of, interaction with and response to, the environment we live in.

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