



AMX PRODUCT DEMO & STRATEGY UPDATE

20 April 2021



AGENDA

This briefing document provides an overview of the Investor Presentation by AMX on its key product demonstrations, R&D and strategic updates

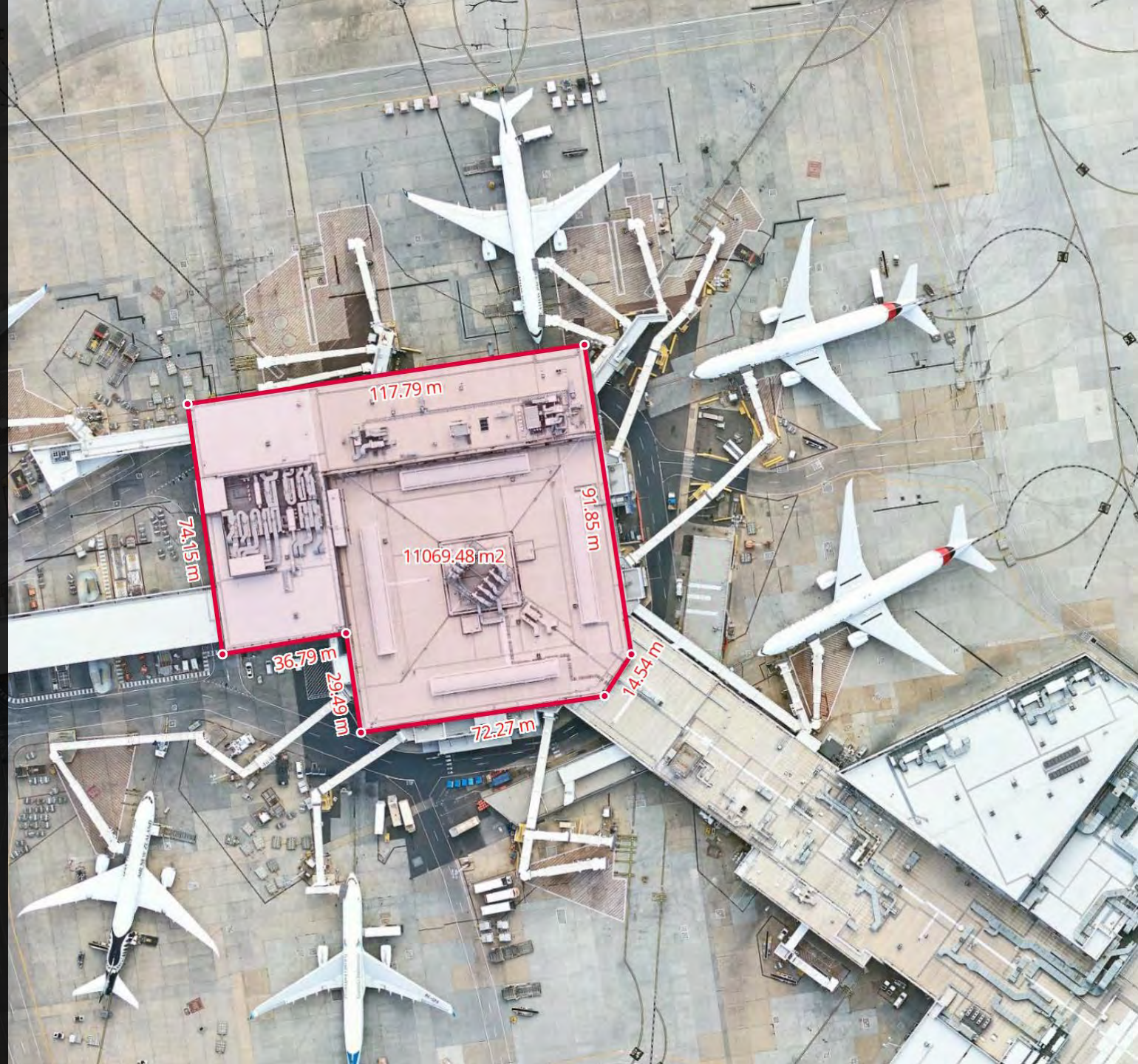
- Introduction: Mark Deuter, Managing Director
- Tech Overview & Update: David Byrne, Chief Operating Officer
- MetroMap – Product Update: Linda Skoog, MetroMap Technical Support Manager
- 3D Modelling – Product Update: Matthew Walker, 3D Product Manager
- LiDAR – Product Update: Alex Rixon, LiDAR Production Manager
- Research & Development Update: Fabrice Marre, Geospatial Innovation Manager
- Q&A

METROMAP

Linda Skoog, Technical Support Manager

SIMPLIFYING SPATIAL INSIGHTS FOR BUSINESS USERS

- Agile, innovative and agnostic development
- From complex to simple
- Timely and direct support
- Enabling workflows and business reporting from spatial imagery and derived data



MetroMap simplifies measurement, comparative analysis through seamless web services

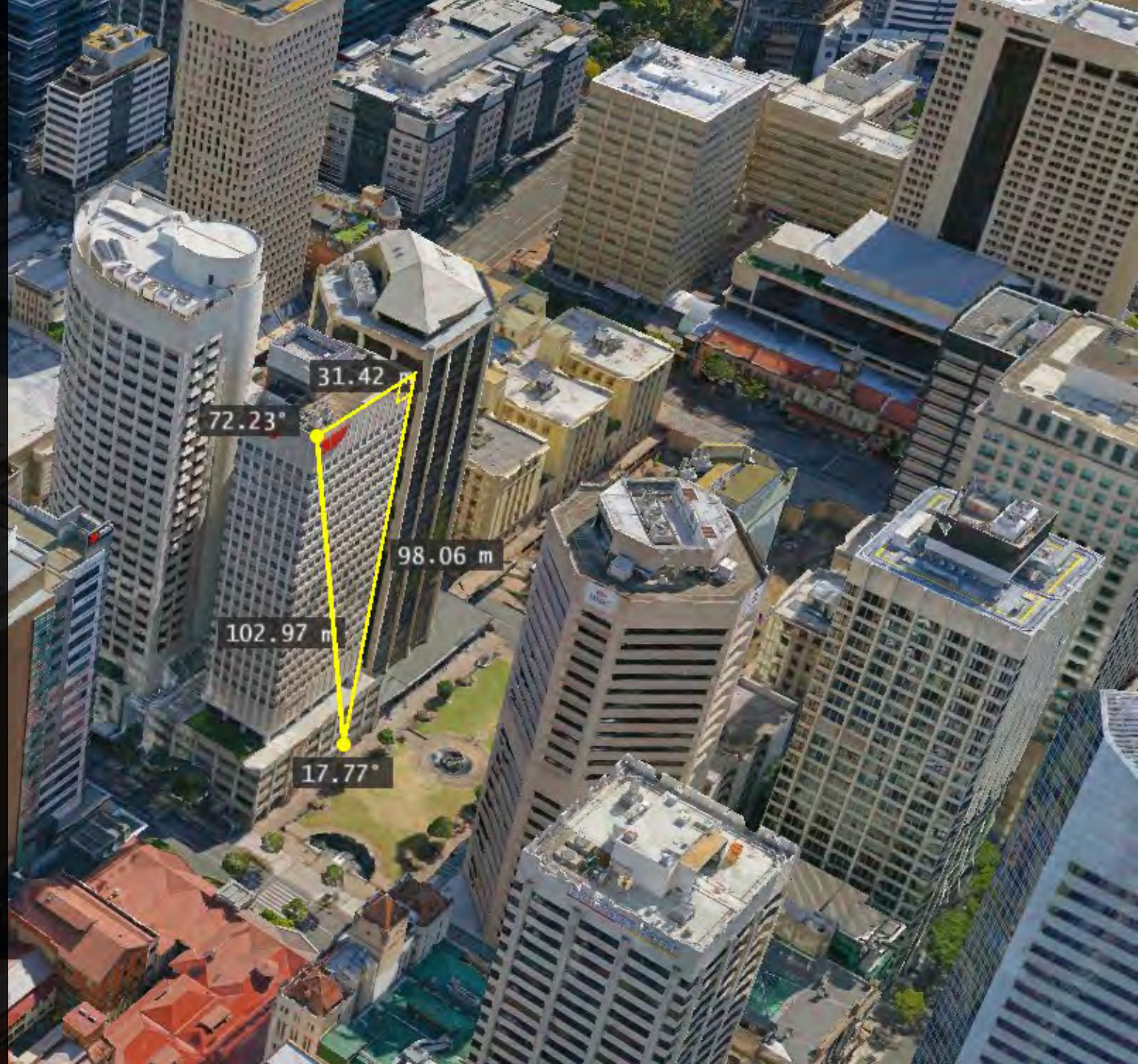
- Up-to-date imagery with frequent captures
- Compare with “Swipe”
- Integrated 3D data & tools



DIVERSIFIED DATA SOURCES

One-stop shop and single site access to

- LiDAR-derived data such as coastal erosion mapping and bushfire fuel load mapping
- Multiple formats and easy accessibility via online store
- Ability to purchase via the MetroMap Store as well as partners



METROMAP STORE

- Making data accessible for all
- Easy & quick way to access 3D data

Product Selection

3D MESH MODEL -

● Adelaide ⓘ
● Adelaide High Res ⓘ

Data Formats Required
☒ OBJ ☒ FBX ☒ SLPK ☒ Cesium 3D Tiles

Selected area: 0.038994 km²

\$278.81 inc GST

☐ Notify me when new data is available

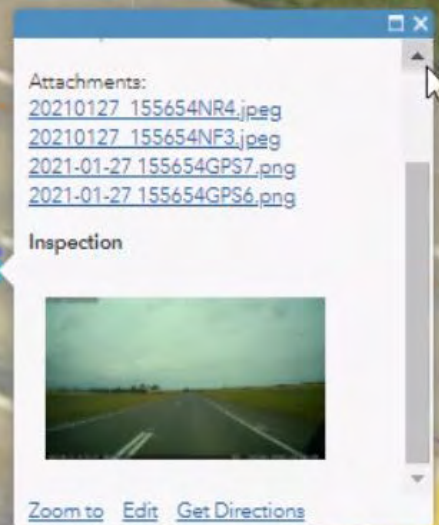
LIDAR POINT CLOUD +

DIGITAL TERRAIN MODEL (DTM) +



ENABLING PARTNER SOLUTIONS

- Partnering with diverse industry experts
- Imagery insights with bespoke tools & reporting
- Collaboration to achieve innovative & dynamic solutions
- Agile and highly accurate image capture enabling reliable and scalable AI derived information

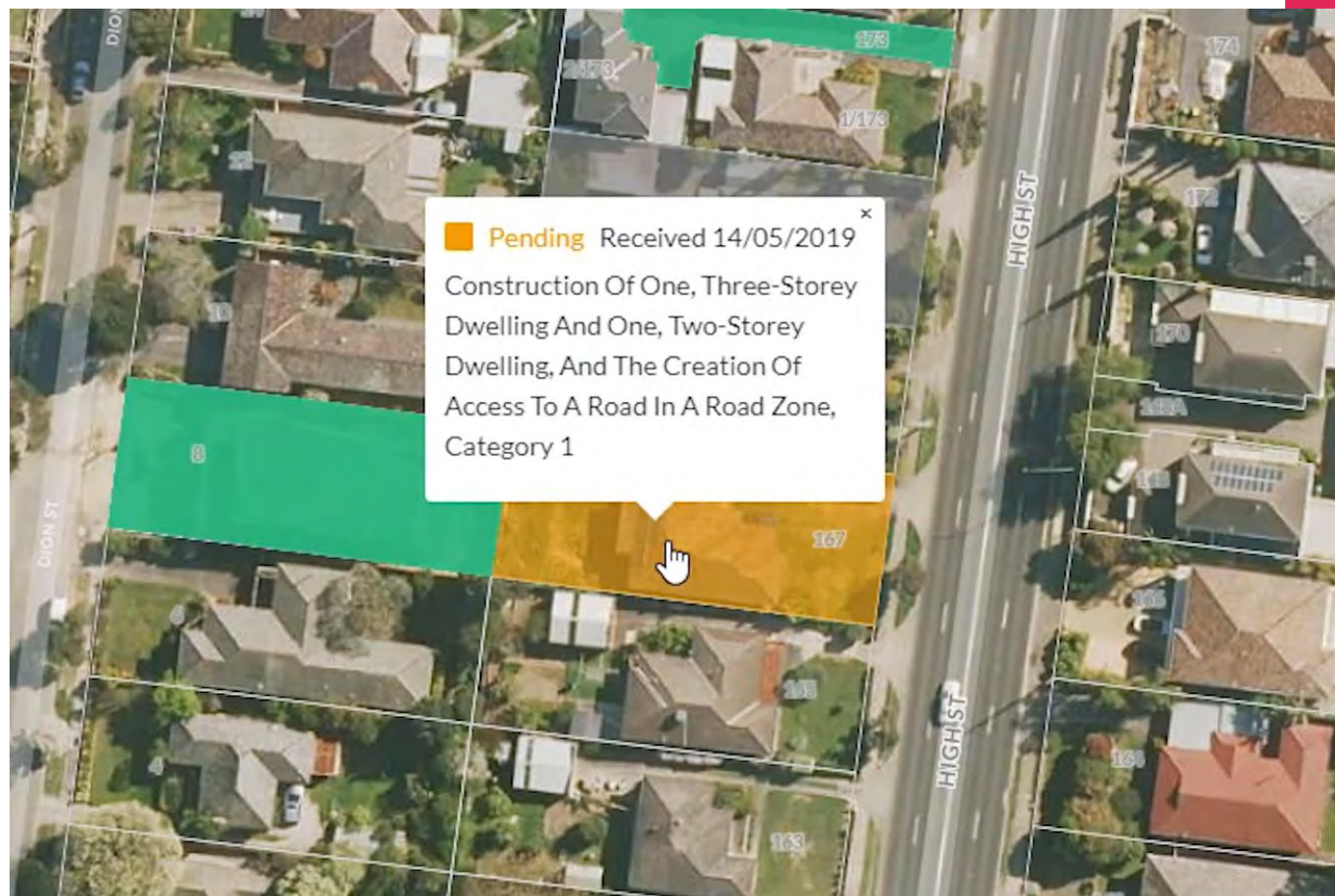


PARTNERING WITH PROFESSIONALS

- API-driven feed directly into our partner applications
- Combining high resolution imagery and customer-centric solutions

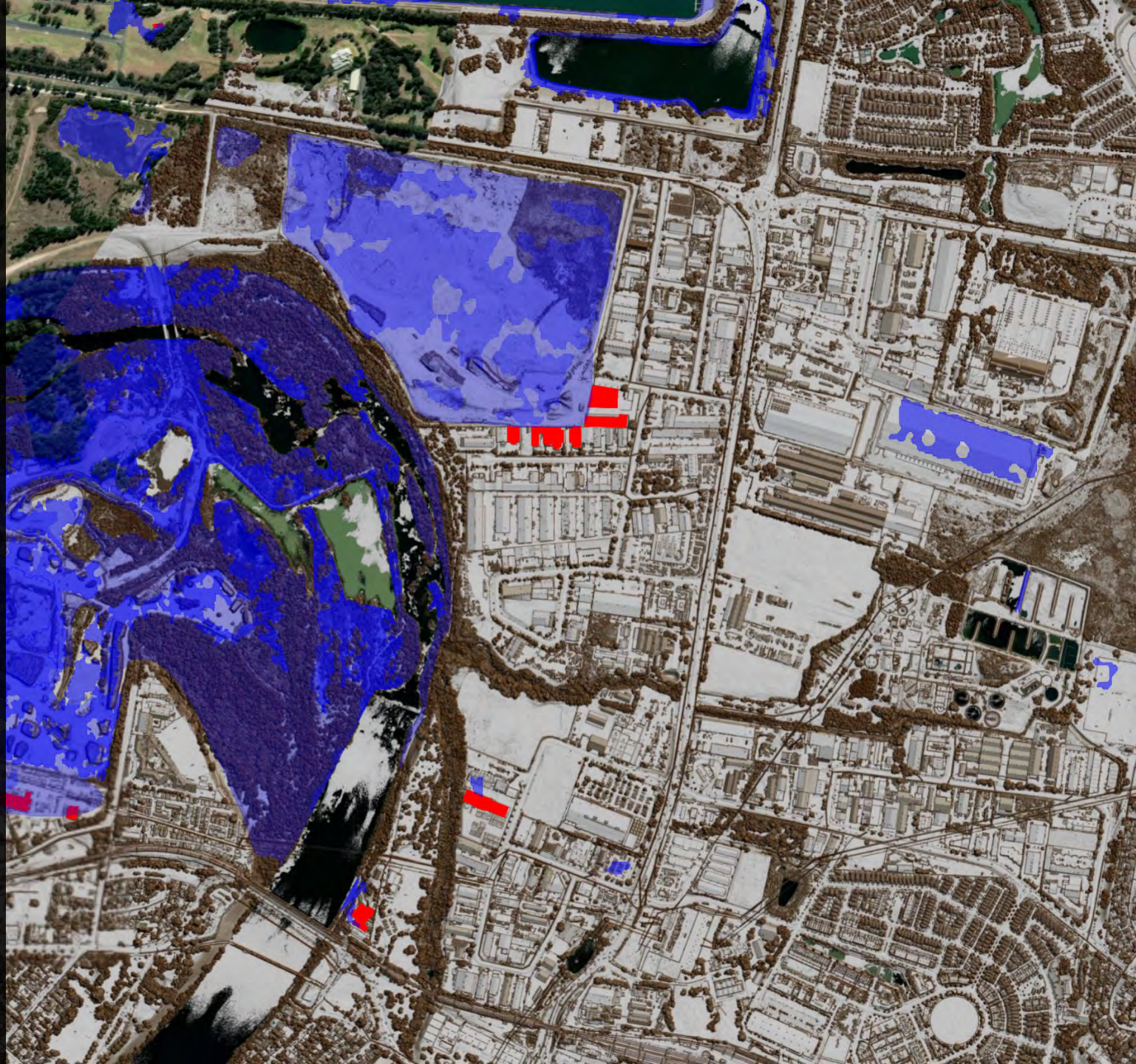
The Landchecker Case Study

- Property information with intuitive data analysis tools
- Helping professionals and home owners make informed decisions, faster



MOVING FROM DATA TO INSIGHTS

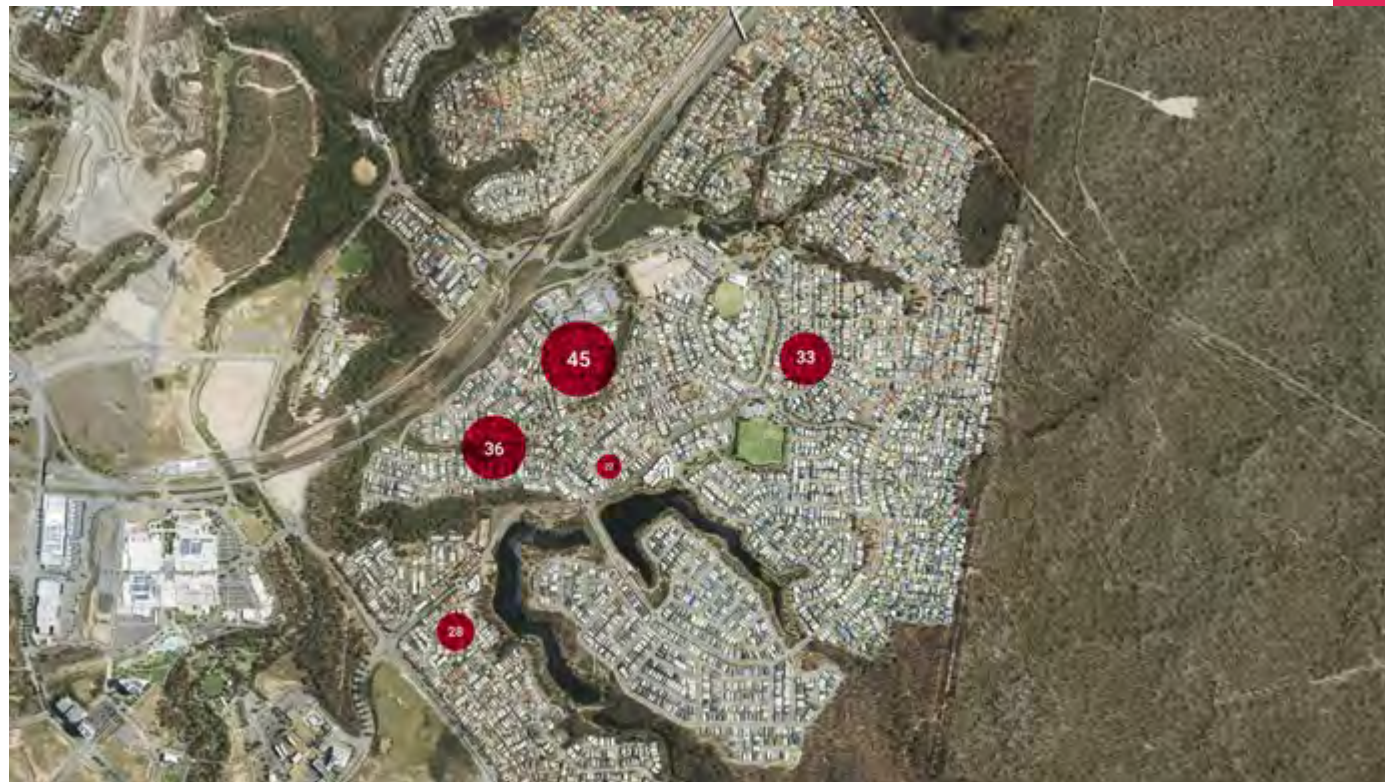
- Insights, solutions and answers
- End-to-end easy to use
- Meaningful visualisation and tools
- AI-derived data and other analytic data adding more value to maps



DATA VISUALISATION AND CUSTOMER WORKFLOWS

The Suncorp Case Study

- Seamless visualisation and tools brought greater insights and efficiencies to Suncorp teams
- Rapid capture & processing post-disaster
- AI-derived data hosting to help rapid assessment of insurance claims



MEANINGFUL INTEGRATIONS

Working with partners helps build the best end-solutions for our customers.

The Geoscape Case Study

This partnership adds valuable insights to MetroMap, such as property data and building attributes (roof details, solar panels and swimming pools)



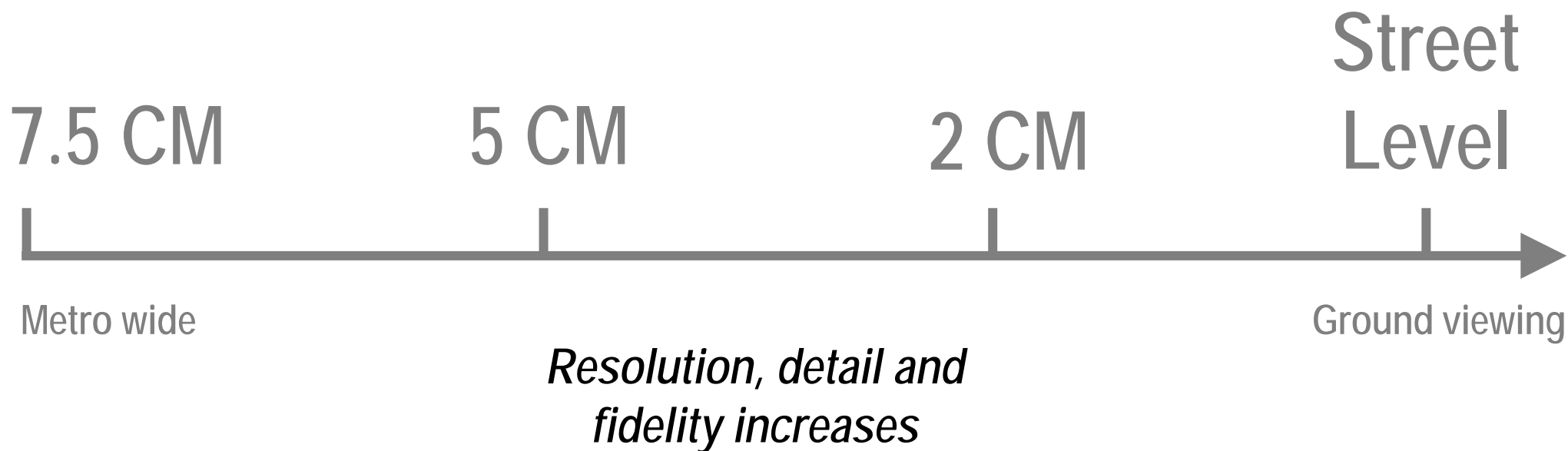
Example of AI-derived data generated in collaboration with partner, Geoscape, as seen on MetroMap Web App

3D MODELLING

Matthew Walker, 3D Product Manager

OUR RANGE OF 3D SOLUTIONS

With a range of 3D resolutions available we offer a broad variety of 3D data to meet our customers needs



OUR 7.5 CM RESOLUTION DATA

- Offers **incredible coverage** over major Australian cities
- Perfect for **high level flythroughs**, strategic **planning** and contextual **background** for higher resolution datasets
- Available now via MetroMap
 - on-demand for your specific area of interest ([MetroMap 3D Store](#))
 - as a one-off city dataset (MetroMap 3D Store)
 - With access to all available cities by signing up to MetroMap 3D Enterprise
- Some of our MetroMap 3D Enterprise Subscribers



OUR 5 CM RESOLUTION DATA

- **Higher resolution** and **higher fidelity** than the standard 7.5cm
- Benefits from **economy of scale** compared to 2cm
- When combined with 2cm priority areas the 5cm resolution datasets offer **exceptional value for detailed context**
- A number of **off the shelf datasets available now** or can be delivered on a project basis



OUR 2 CM RESOLUTION DATA

- Contains **14x more texture data** than standard 7.5cm resolution 3D datasets
- Used across **State** Governments, **Local** Governments, Planning, Infrastructure, Construction, Design, Mining and Property industries because of its **exceptional detail and accuracy**
- Growing list of 2cm resolution CBD datasets becoming **available on our MetroMap 3D Store** (including Melbourne and Sydney)



OUR STREET LEVEL DATA

- Our **multi level acquisition** and processing pipeline allows for the merging of **Street Level and Aerial Photogrammetry**
- This is an **unprecedented 3D product** giving the most rich and detailed view available in the market
- Suitable for viewing and experiences at a ground level
- **16x more texture data** than 2cm models
- Seamless integration to 2cm models



3D MODELS AND GAME ENGINES

We continue to innovate with workflows to put our 3D data into the latest game engines

- Allows innovative use cases
- Diversifies customer base
- Opens our data for use to new industries
- Lowers barrier to entry by enabling in-house use
- Fills a range of needs that don't exist in current 3D software packages



EXCITING GROWTH MARKETS

We are supporting the next wave of industries embracing 3D data, pioneering the way for broader use in new and developing markets, such as

- Virtual engagement
- Prop Tech, Real Estate
- Event pitching and planning
- Engineering and Design
- City planning, Digital Twins
- Tourism



VIRTUAL ENGAGEMENT

The Adelaide Convention Bureau Case Study

Bringing clients closer virtually

How do you sell a location and an experience to an audience that can't travel to you?

- Aerometrex supplied 3D data is allowing them to do it digitally
- Giving a realistic experience and allowing critical business to continue throughout the pandemic



REAL ESTATE

By combining a range of data resolutions and adding in future developments and proposed designs, 3D data is the real estate industry's best visual asset

- A very acute vision of the future can be shown allowing for informed and accelerated buying decision
- Useful to show not only what the current situation is from a proposed development but also what it could be in the future



EVENT PITCHING

How do you sell a location and an experience that hasn't been done before?

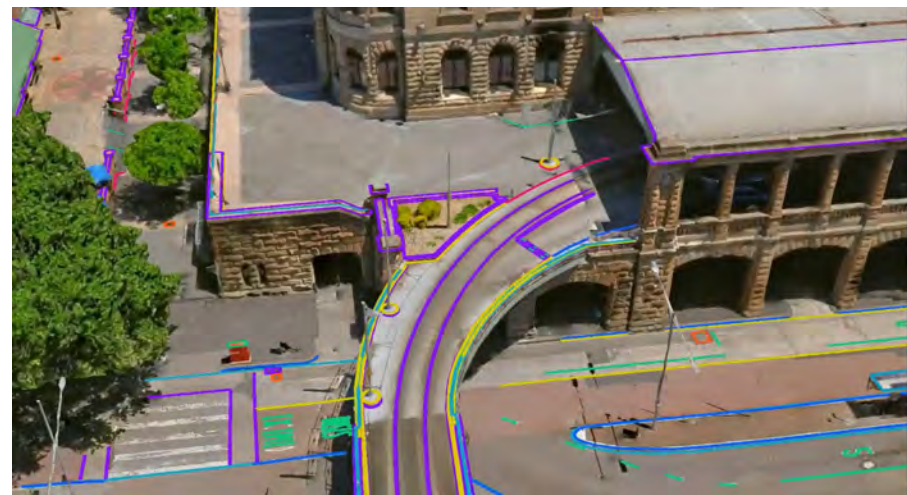
- Start with an accurate & visually rich 3D model of your environment
- Then add 3D assets to show your proposal in its actual location



Example of an Aerometrex 3D model of a heritage town in Australia converted digitally into a venue for a Formula E event

ENGINEERING & DESIGN

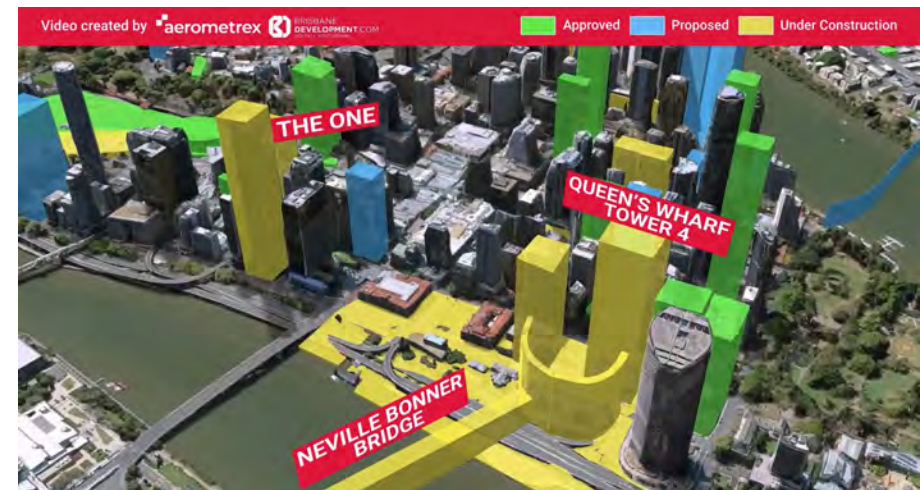
- Aerometrex 3D data is actively being used to support billions of dollars of infrastructure work nationally
- 3D Photogrammetry can be used across an entire project lifecycle and is being added to projects as a foundation dataset for BIM and Digital Twins
- These include major road & rail projects, such as the level crossing removal programs in Melbourne and Adelaide



CITY PLANNING

How is 3D helping our clients improve city planning?

- Today, urban planners can add rich 3D city models that have all road & bridge structures, as well as surrounding vegetation
- Proposed development applications and approved ones can be overlayed to show how a city is going to grow
- Our data is enabling customers to show not only how a building looks from the outside but also what views are available from the inside





FUTURE INTEGRATIONS AR / VR + ML / AI

With Augmented Reality and Virtual Reality technology finding footholds in multiple industries, we're ready to integrate our data into exciting new technology supporting AR/VR.

Our R&D team are also expanding the value of our 3D models by using Artificial Intelligence to classify & segment data from our 3D Mesh models



INTERNATIONAL OPPORTUNITY

Our US 3D operations are well underway in capturing major capital cities and bespoke project work

- Denver and Miami are complete and San Francisco in the process of being captured
- Soon available for Clip, Zip and Ship from our Aerometrex US 3D Store



LIDAR

Alex Rixon, LiDAR Production Manager

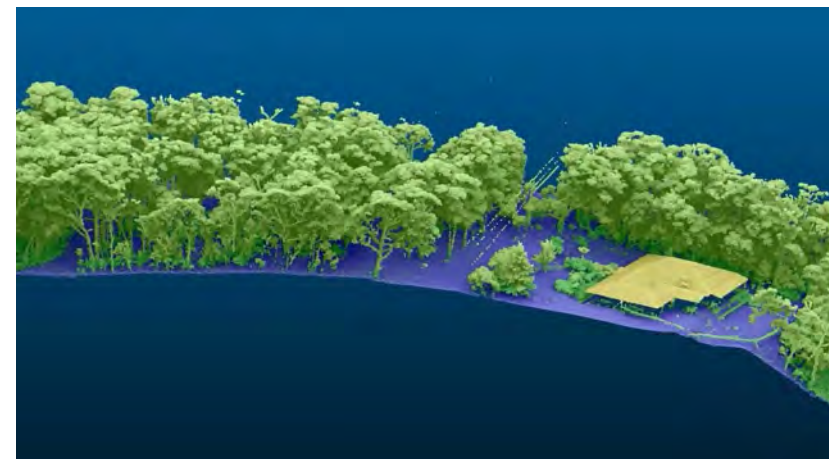
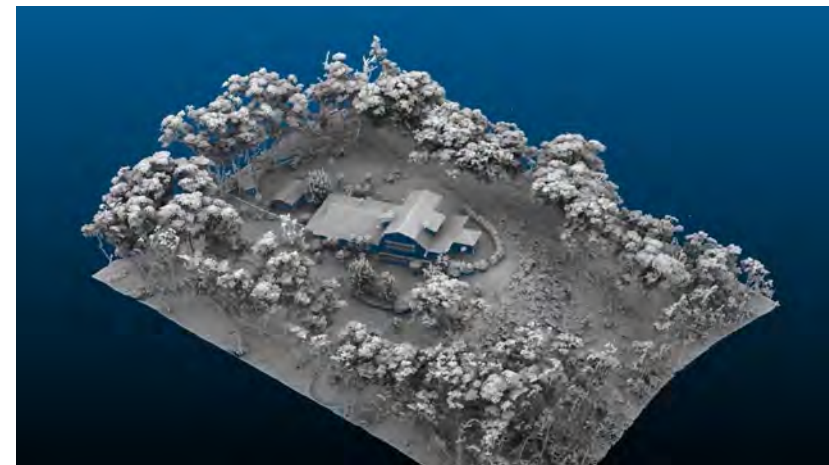


WHAT IS LIDAR?

LIGHT DISTANCE AND RANGING

QUALITY AND ATTENTION TO DETAIL

- With LiDAR, small features such as fallen trees, sheds and fences are clearly visible under dense vegetation cover
- AMX can capture LiDAR point clouds ranging in density from 1-2 ppm (points per sq m), all the way up to 200 ppm
- 3-dimensional shape of building roofs and powerlines have many applications in urban and utility modelling

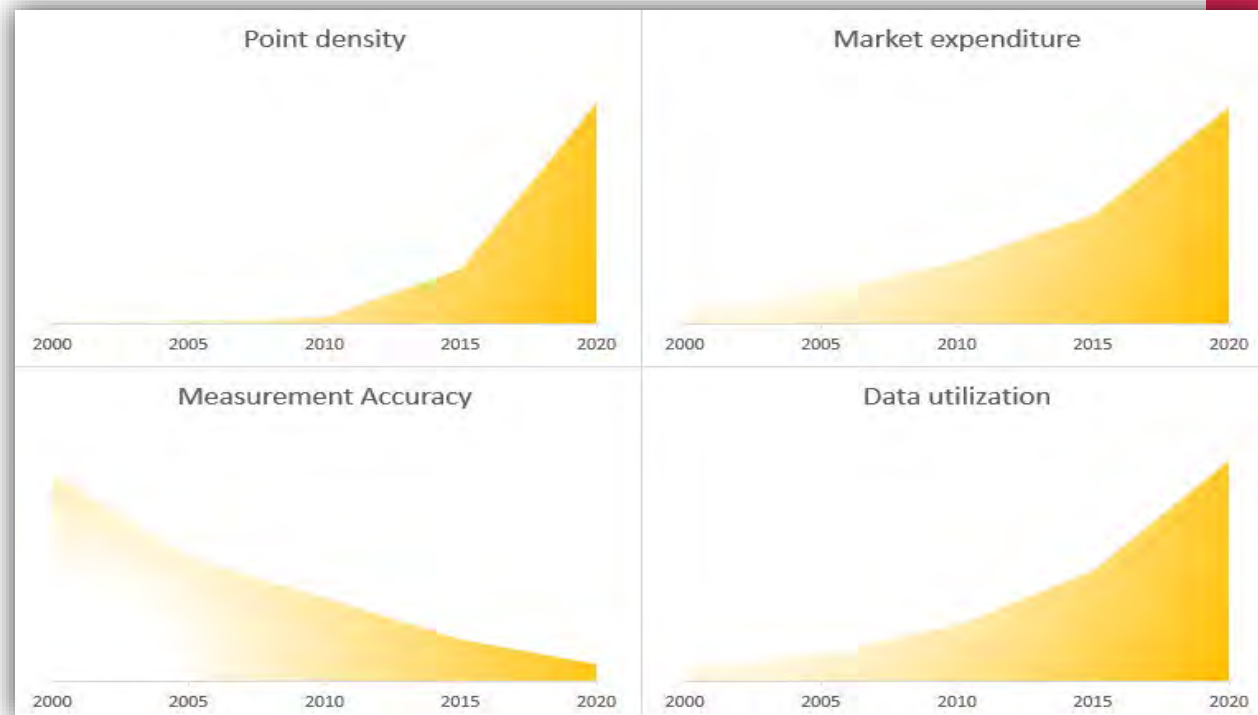


A HISTORY OF GROWTH

Improved LiDAR sensor technology has resulted in

- More dense point clouds
- More accurate datasets
- More use cases & projects

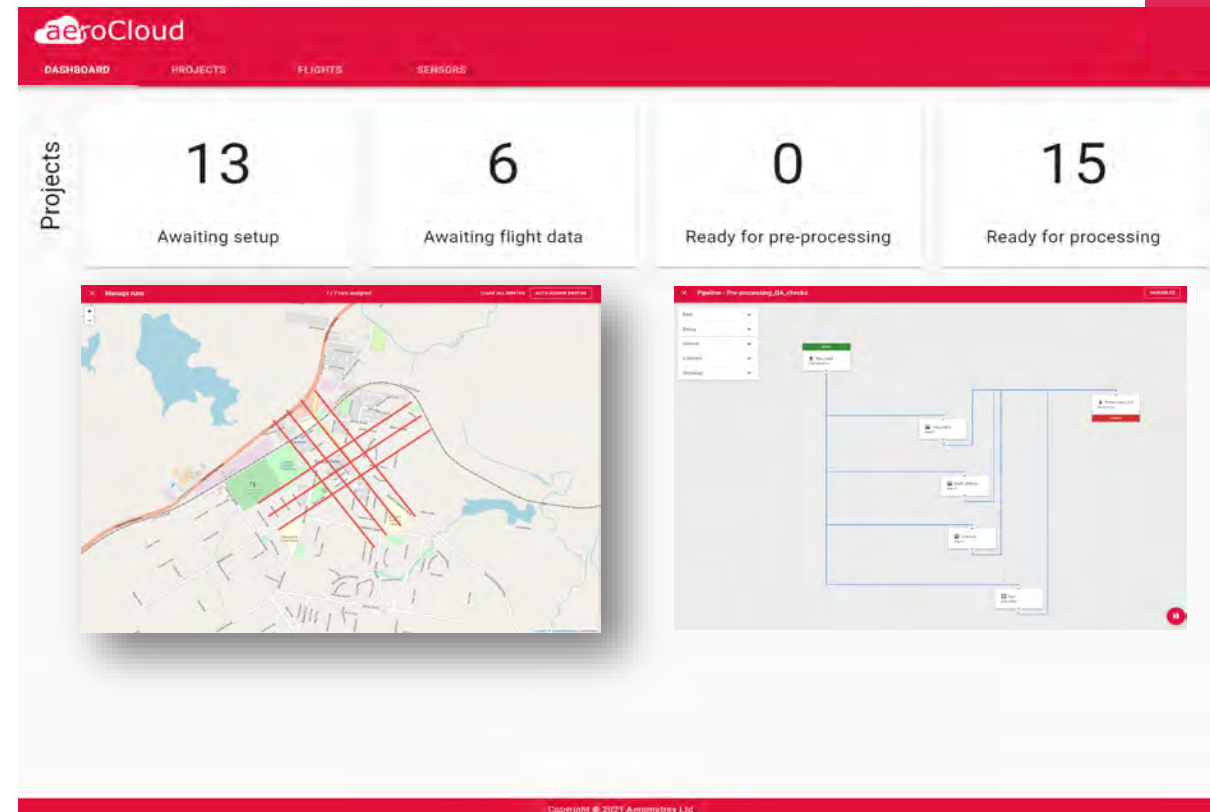
We have responded to these trends by increasing & upgrading our sensors to the latest technologies. We are future focused, investing in research and development, cloud computing and AI programs.



INNOVATION DRIVING EXCELLENCE

Weeks of processing reduced to a few hours

- Automated workflows
- Cloud processing platform
- Low costs – High quality



LIDAR AND MINING

Mines are dynamic environments that require continuous monitoring and planning.

Aerometrex provides accurate LiDAR and imagery data to mines as well as a wide range of value-added analytical services. We capture data over mine sites on a monthly or quarterly basis.

These projects are logistically challenging due to remote areas and the expectation for fast data delivery. Cloud processing and direct data uploads from the field make this possible.

IMPROVING SAFETY

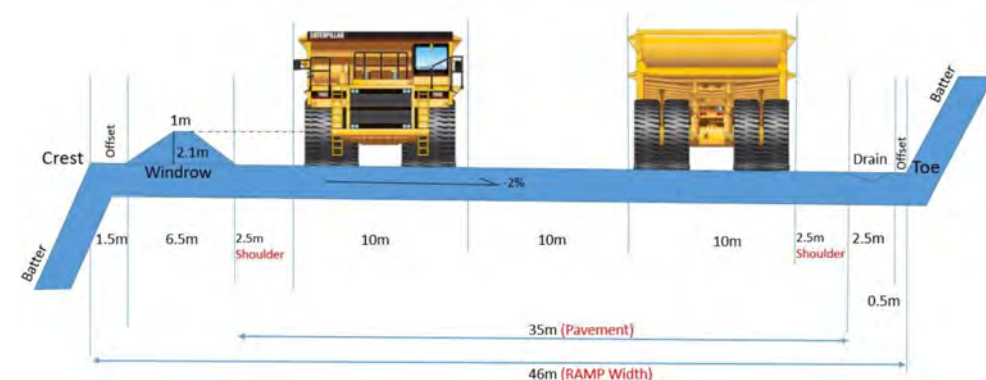
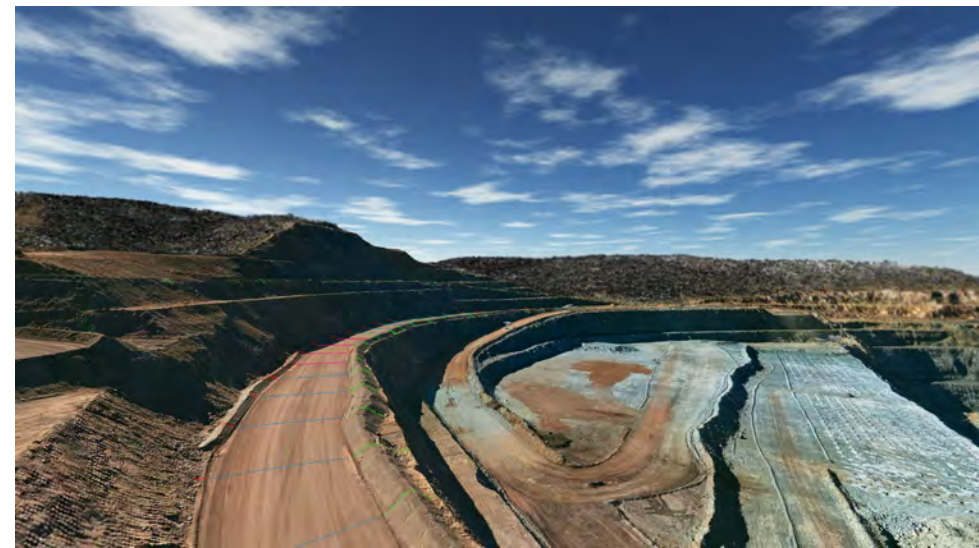
Mine sites require accurate and reliable data to plan mining activities. AMX provides detailed analysis for

- Safety compliance
- Windrow height and width
- Slope analysis
- Volume calculation



MINE WINDROW ANALYSIS

- With minimal setup, our semi-automated workflows allow Aerometrex to provide analysis on roads, safety bunds and windrows in just a few hours.
- Roads are measured for width and slope characteristics, while safety bunds are checked to ensure that they comply with height, width and slope requirements for the site.
- Fast turn around of reports and maps provided allow mine managers to schedule any remedial actions required to meet compliance.



VOLUME CALCULATION

AMX also provides accurate productivity reports for mining clients. Stocking volume curves for sillage ponds or wastewater reservoirs provide vital insight for the management and lifecycle of these assets.

Our mining clients rely on us to provide fast and accurate

- Stockpile volume reports
- Pit or pond volumes
- End of month surveys

Cut volume, m3	Cut area, m2	Fill volume, m3	Fill area, m2
177590.47	28369.7	10.38	137.3
501857.53	40955.3	161.75	388.0
1669785.2	102314.0	280.71	1059.8
3481077.8	157042.6	5.69	63.5
599430.8	59715.9	50.86	579.0





LIDAR AND VEGETATION MODELLING

Another application of LiDAR data is the modelling of vegetation. Only LiDAR data provides detailed modelling of the entire tree structure.

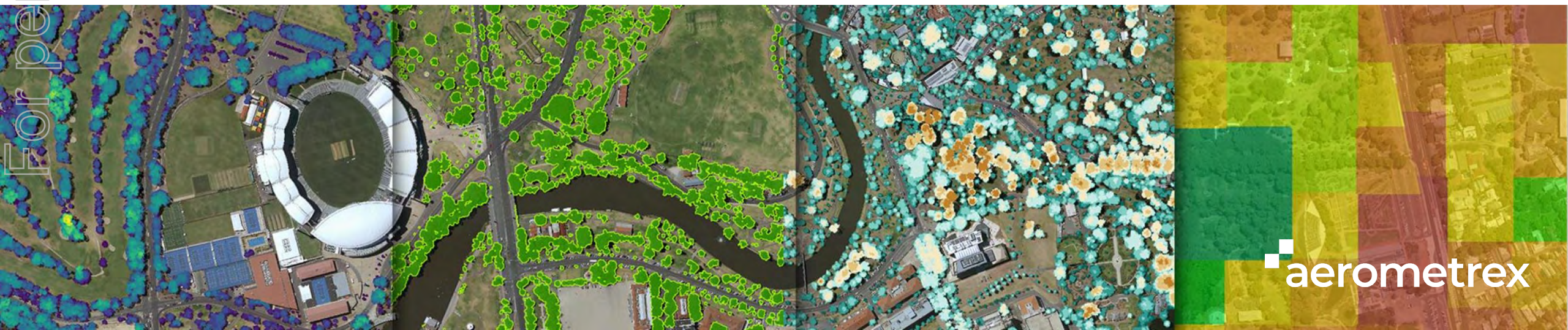
Aerometrex uses this data to provide solutions to local & state governments and for forestry applications.

ANALYSING VEGETATION STRUCTURES

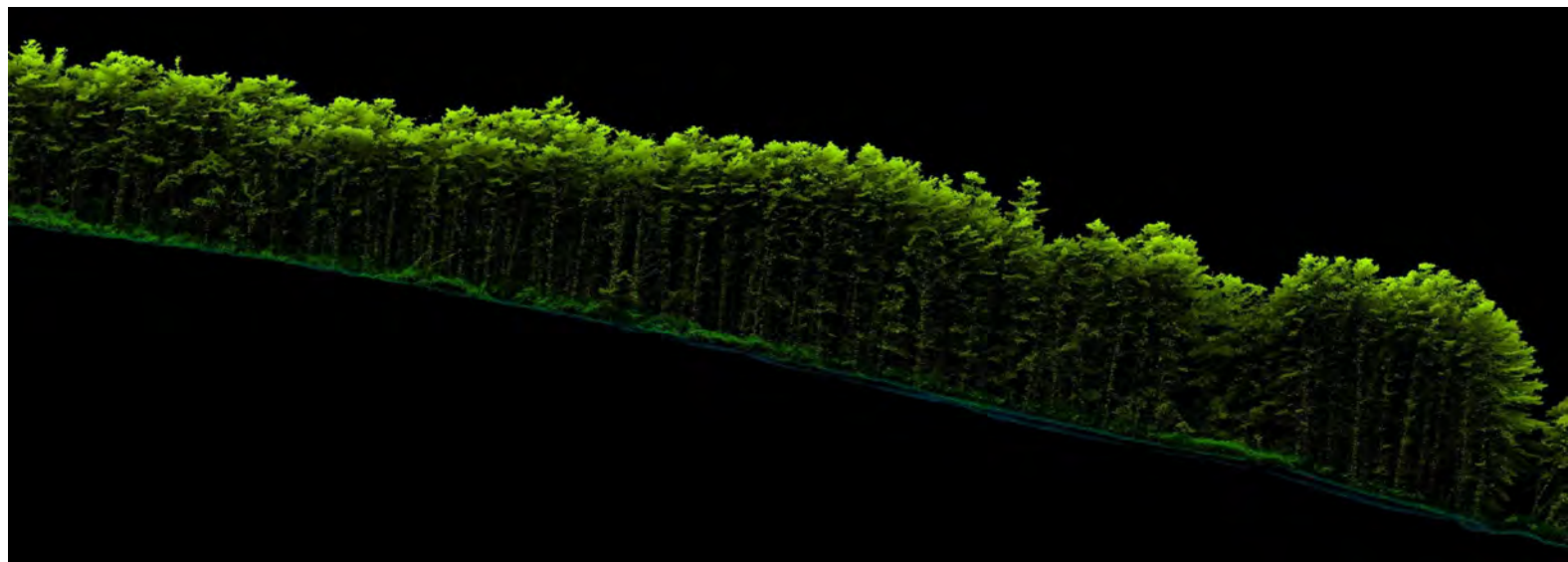
Detailed canopy metrics provide insights into the amount and type of vegetation coverage within a project area.

Our LiDAR-derived vegetation models are a tool used by government to manage issues such as

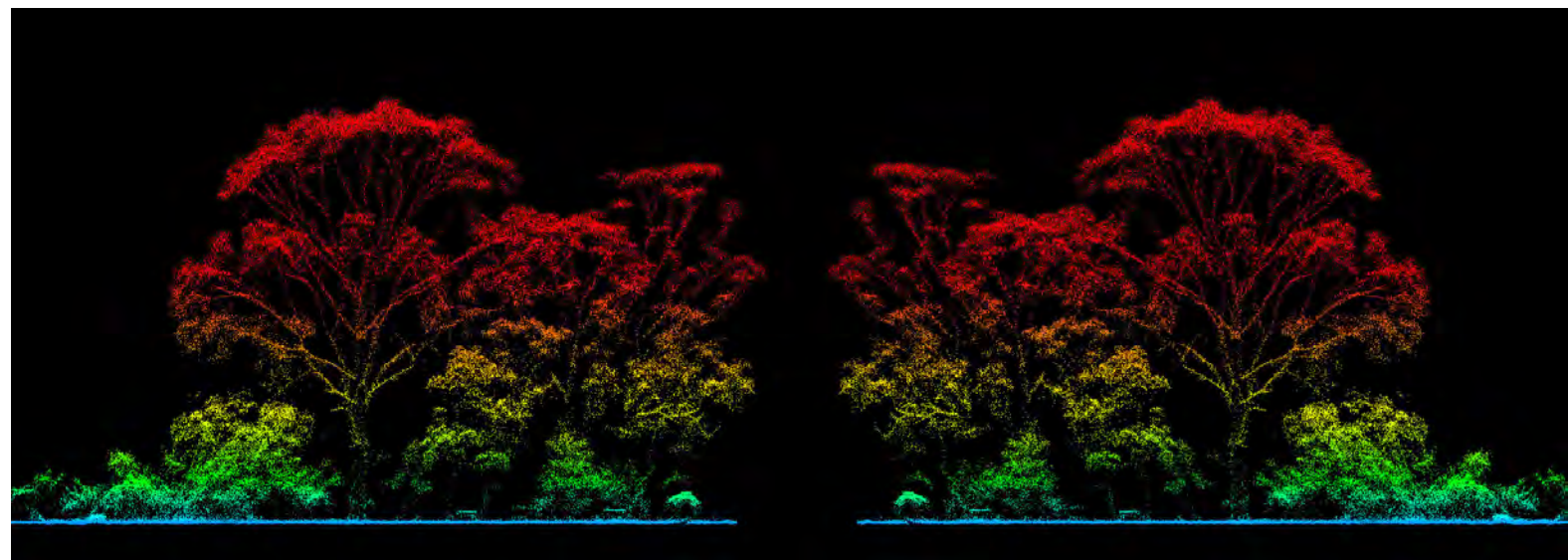
- invasive species detection
- improve green space
- urban heat modelling



For managed forestry assets, Aerometrex provides detailed datasets that are used to monitor tree growth, predict harvest yield and improve harvest performance.



Through detailed modelling of the terrain under vegetation, analysis of access tracks and planation rows can be undertaken, allowing harvesters plot save & efficient routes with onboard data systems.



CANOPY MODELS

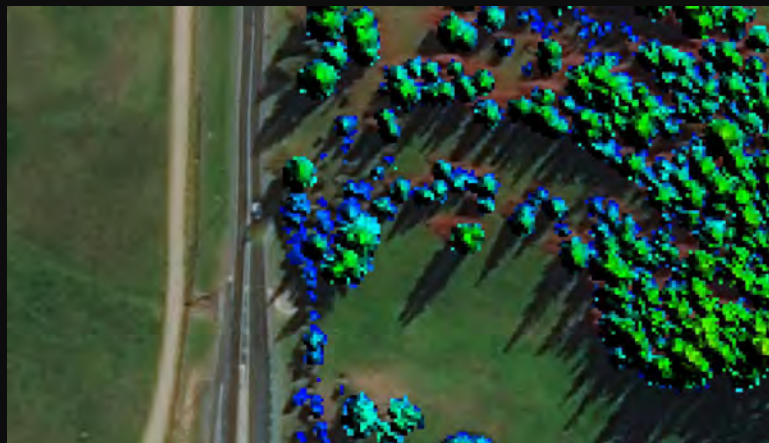
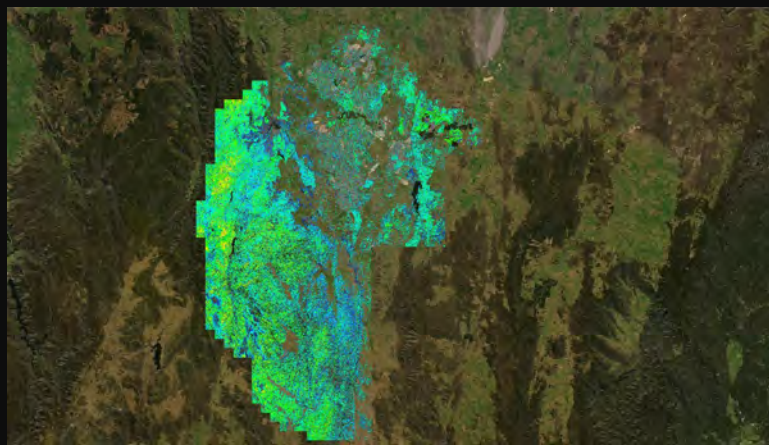
Our detailed vegetation analytics provide insight into the amount of area that is covered by vegetation in specific height ranges above the ground. AMX provides analysis that includes

- Height of vegetation
- Density of vegetation
- Change detection
- Detailed reporting
- Valuable insights



Aerometrex have completed vegetation mapping at massive scales. Seen here are images from an ACT analysis that included detailed vegetation height models and land cover models prepared over the entire ACT region, comprising more than 90 Billion LiDAR measurements over a project area of 3,300 sq km.

These images represent the heights all vegetation taller than 3m.





METROMAP

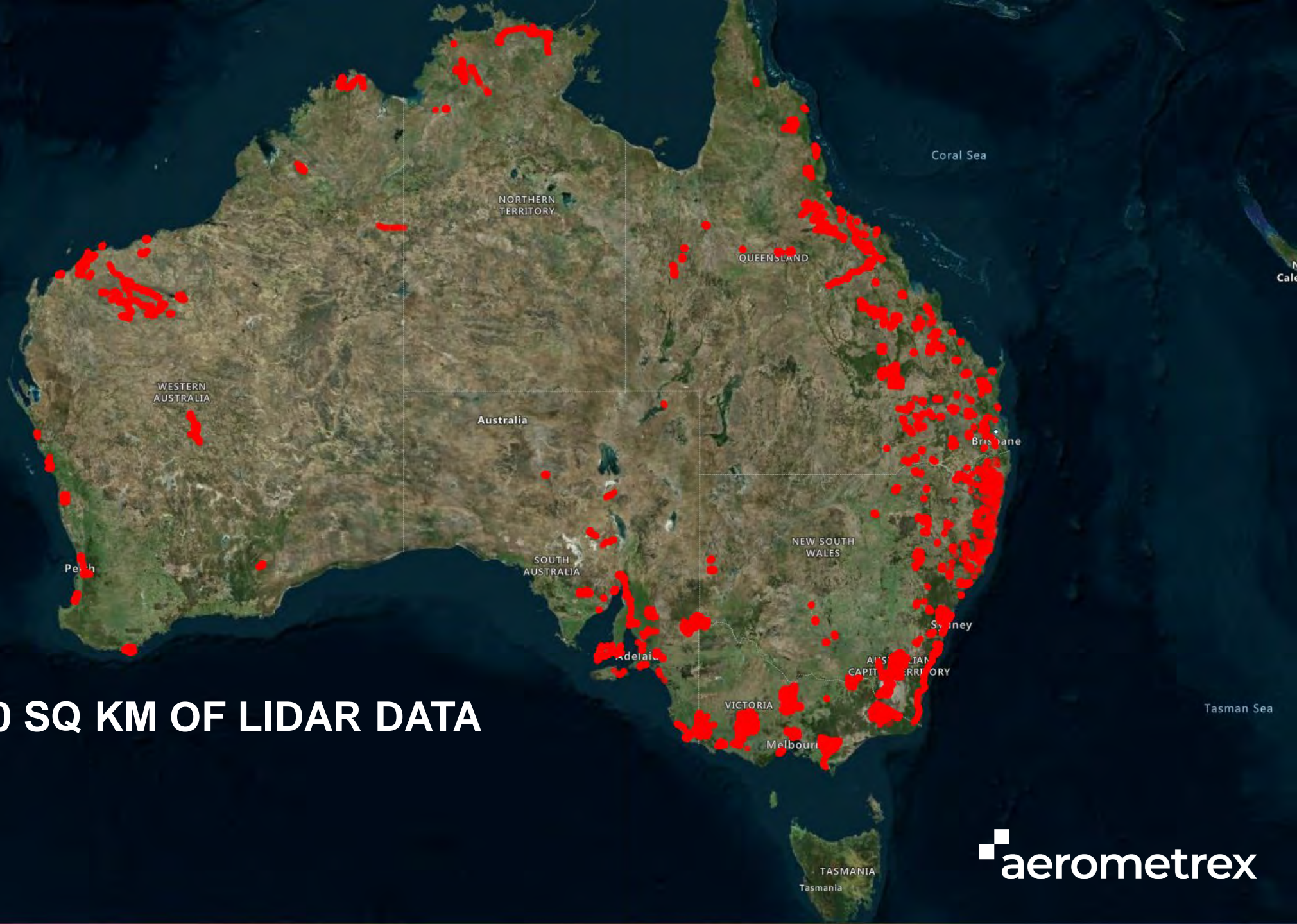
MAKING LIDAR ACCESSIBLE

LiDAR datasets can be massive, leading to issues of cost and scale that are prohibitive to small users.

Aerometrex is making data more accessible via its MetroMap platform, creating the opportunity to purchase quality and up-to-date data on smaller scale.

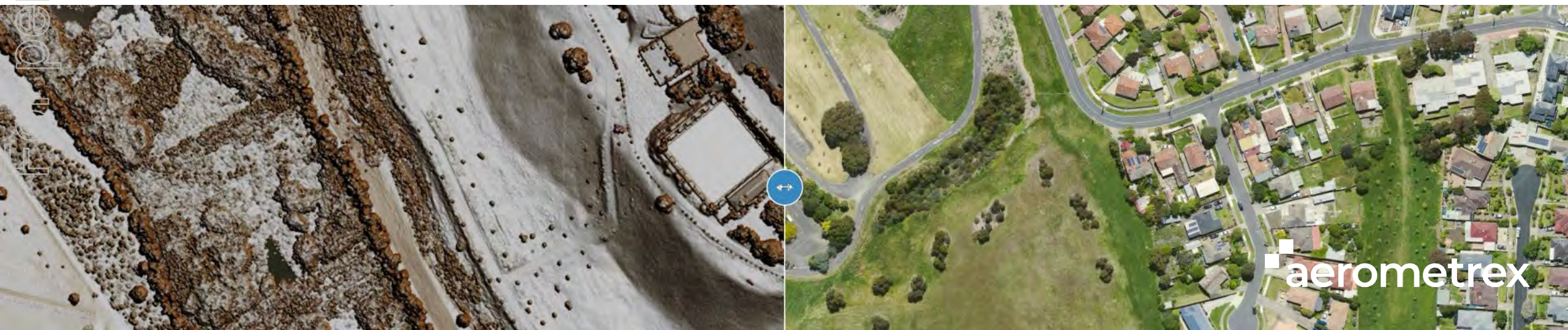
Our LiDAR-derived datasets are available for purchase on a per-use basis on top of MetroMap subscriptions

Over 95,000 SQ KM OF LIDAR DATA



LIDAR-DERIVED DATA ON METROMAP

- With the LiDAR coverage, users can see the shape of terrain and additional contextual information, that is not available from imagery alone
- These functions lower the barrier to entry for first time LiDAR uses and make these quality dataset more accessible to existing and new clients



THE AMX LIDAR PROMISE

- Latest technology
- Scalable cloud processing
- Valuable insights
- More accessible

RESEARCH AND DEVELOPMENT

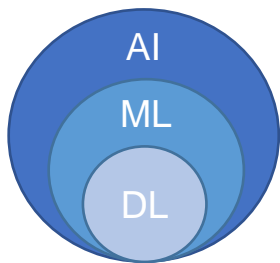
Fabrice Marre, Geospatial Innovation Manager



LATEST INNOVATIONS

- Transforming geospatial data into knowledge using Artificial Intelligence
- Change analysis products
- Permeable vs impermeable surfaces mapping
- Bushfire fuel load mapping

TRANSLATING GEOSPATIAL DATA INTO KNOWLEDGE USING MACHINE LEARNING



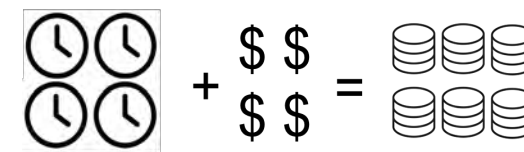
picture



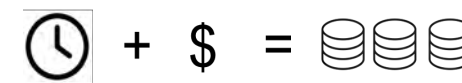
label

- **Machine Learning:** ML techniques enable machines to improve at recognising objects with experience
- **Training:** learning to recognise an object from a lot of imagery which has been labelled

Manual data labelling to produce training dataset



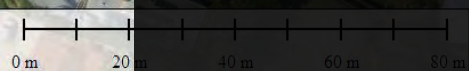
AMX automatic optimised data labelling to produce training dataset



FROM DATA TO INFORMATION TO ACTIONABLE KNOWLEDGE

Semantic image
segmentation using in-house
Deep Learning approach

- Buildings (WIP)
- Solar panels
- Trees
- Swimming pools
- Cars
- Major roads



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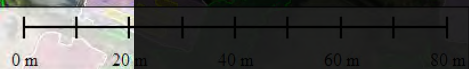


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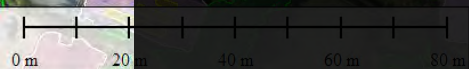
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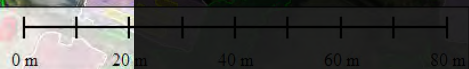



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- Swimming pools
- Cars
- **Major roads**





FROM DATA TO INFORMATION TO ACTIONABLE KNOWLEDGE

- Additional information can be extracted if elevation layer is available
- Scalable
- MetroMap compatible layers
- Commercially available (<1 month)

ENHANCED 3D CITY MODELS

- 3D Mesh classification and analytics

Aerometrex data used in Skyline Terraexplorer

Polygon Properties	
Attributes	
BLD_MAX_H	33.247
BLD_AVG_H	30.415
SURFACE_AR	332.22453187669
GRD_H	25.288
EST_STOREY	3

ENHANCED 3D CITY MODELS

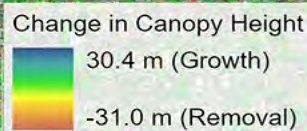
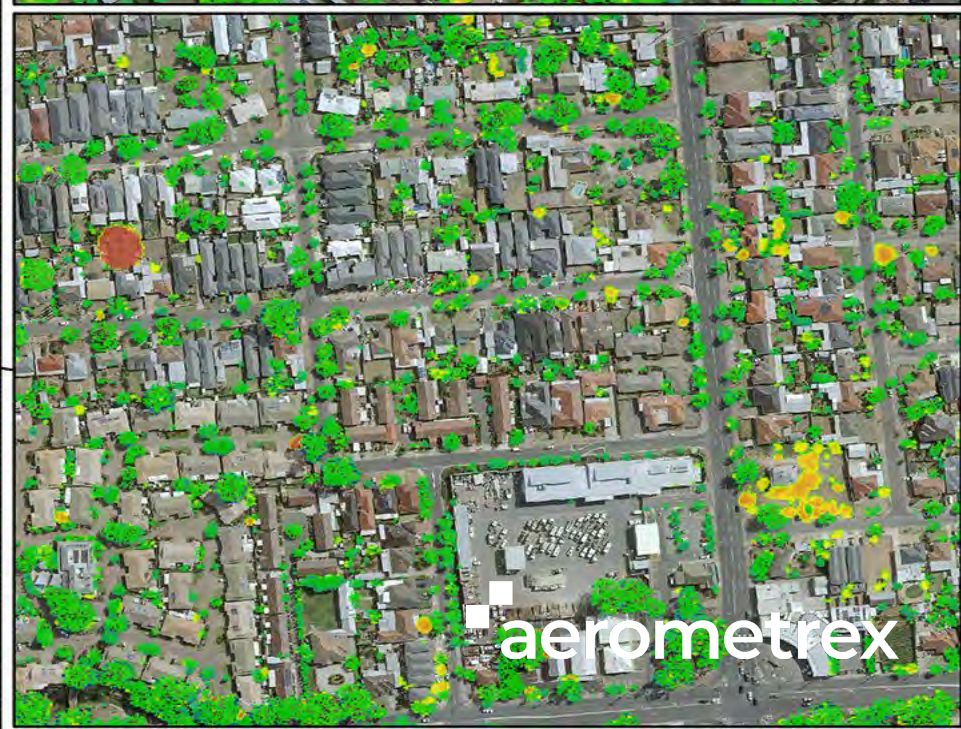
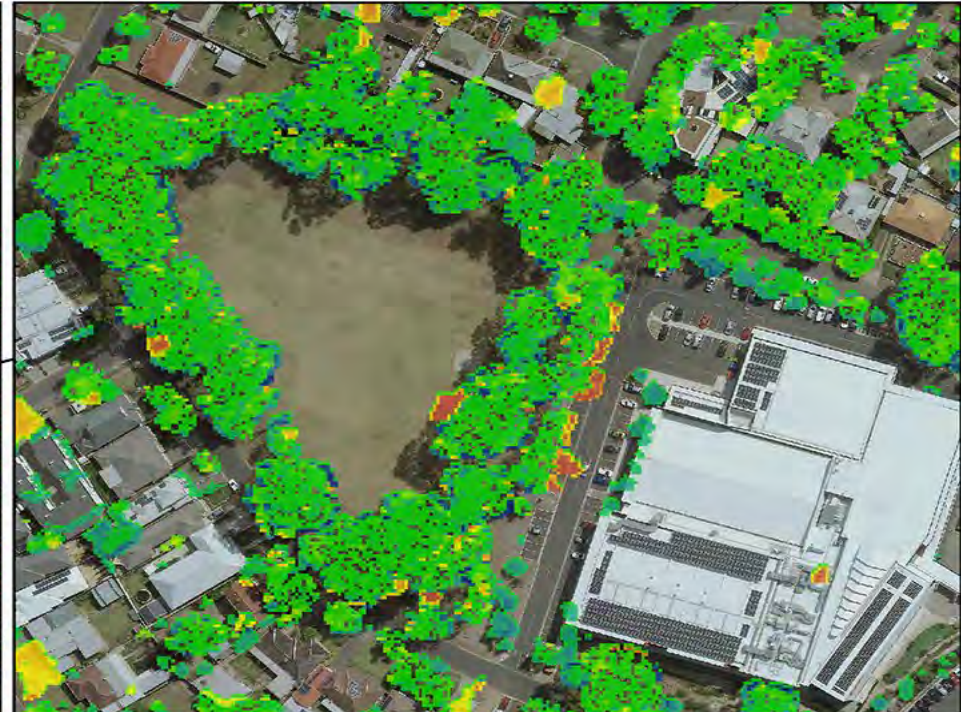
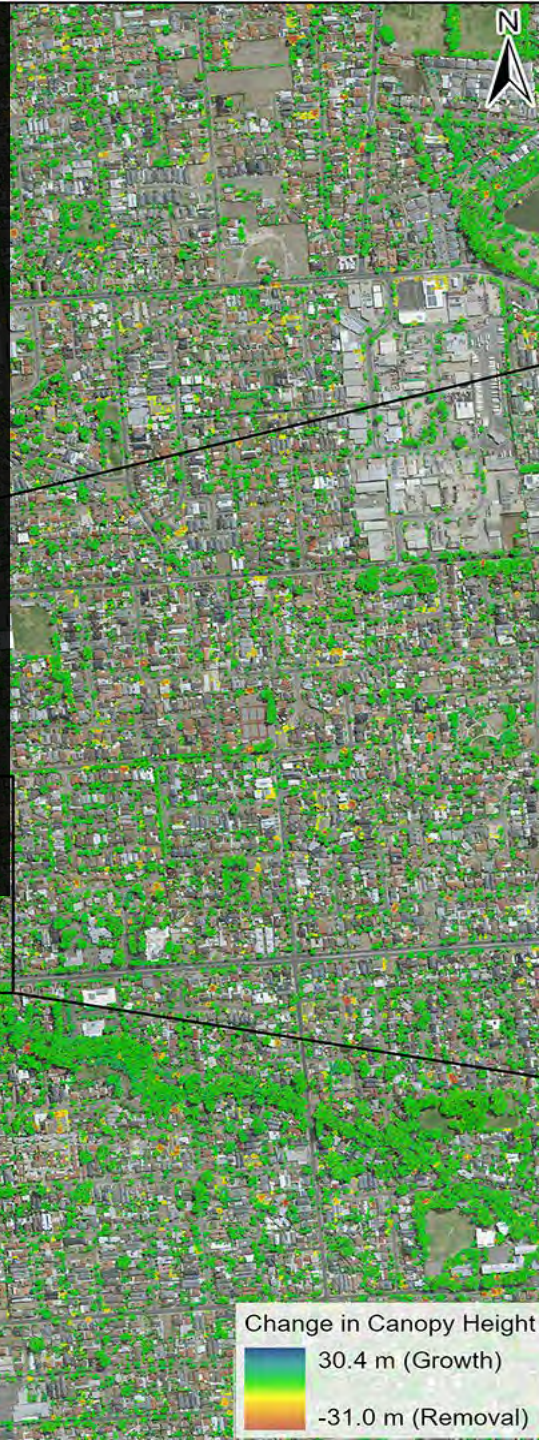
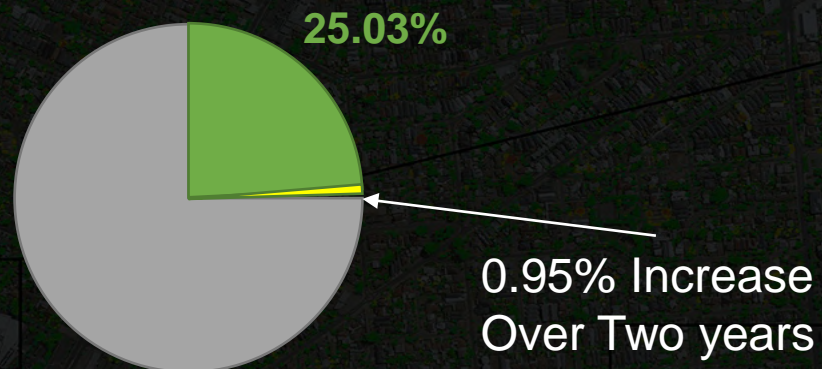
- AI system automatically replaces trees with computer-generated trees



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CHANGE ANALYSIS

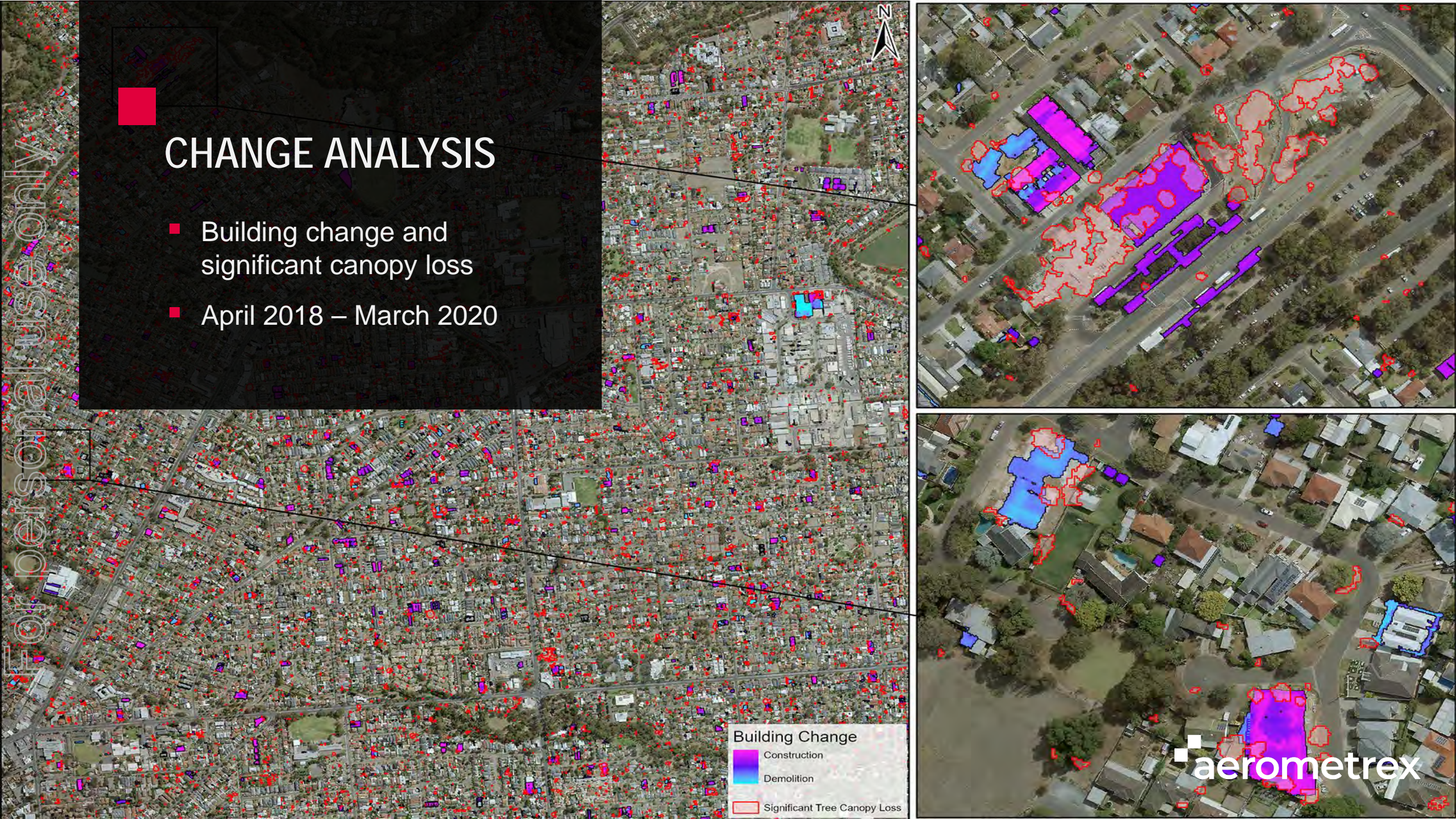
- Change in tree canopy height [Apr '18 – Mar '20]



aerometrex

CHANGE ANALYSIS

- Building change and significant canopy loss
- April 2018 – March 2020



CHANGE ANALYSIS

- Spatial distribution of tree canopy change
- April 2018 – March 2020

Gain - Hotspot Analysis

Cold Spot - 99% Confidence
Cold Spot - 95% Confidence
Cold Spot - 90% Confidence
Not Significant
Hot Spot - 90% Confidence
Hot Spot - 95% Confidence
Hot Spot - 99% Confidence

Loss - Hotspot Analysis

Cold Spot - 99% Confidence
Cold Spot - 95% Confidence
Cold Spot - 90% Confidence
Not Significant
Hot Spot - 90% Confidence
Hot Spot - 95% Confidence
Hot Spot - 99% Confidence

3D CHANGE ANALYSIS

Quantitative 3D change analysis for:

- Coastal erosion monitoring
- Cliff monitoring (underground mines)

3D CHANGE ANALYSIS

Quantitative 3D change analysis for:

- Coastal erosion monitoring
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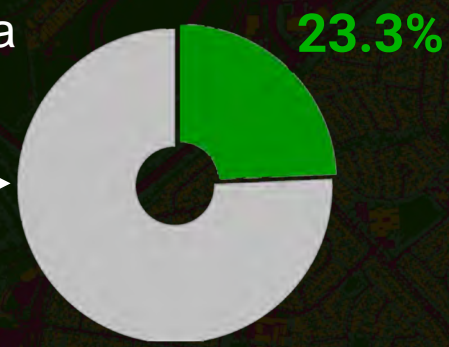
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PERMEABLE & IMPERMEABLE SURFACE MAPPING

- Where can all the new trees go?

What is the area not covered by tree canopy made of? →

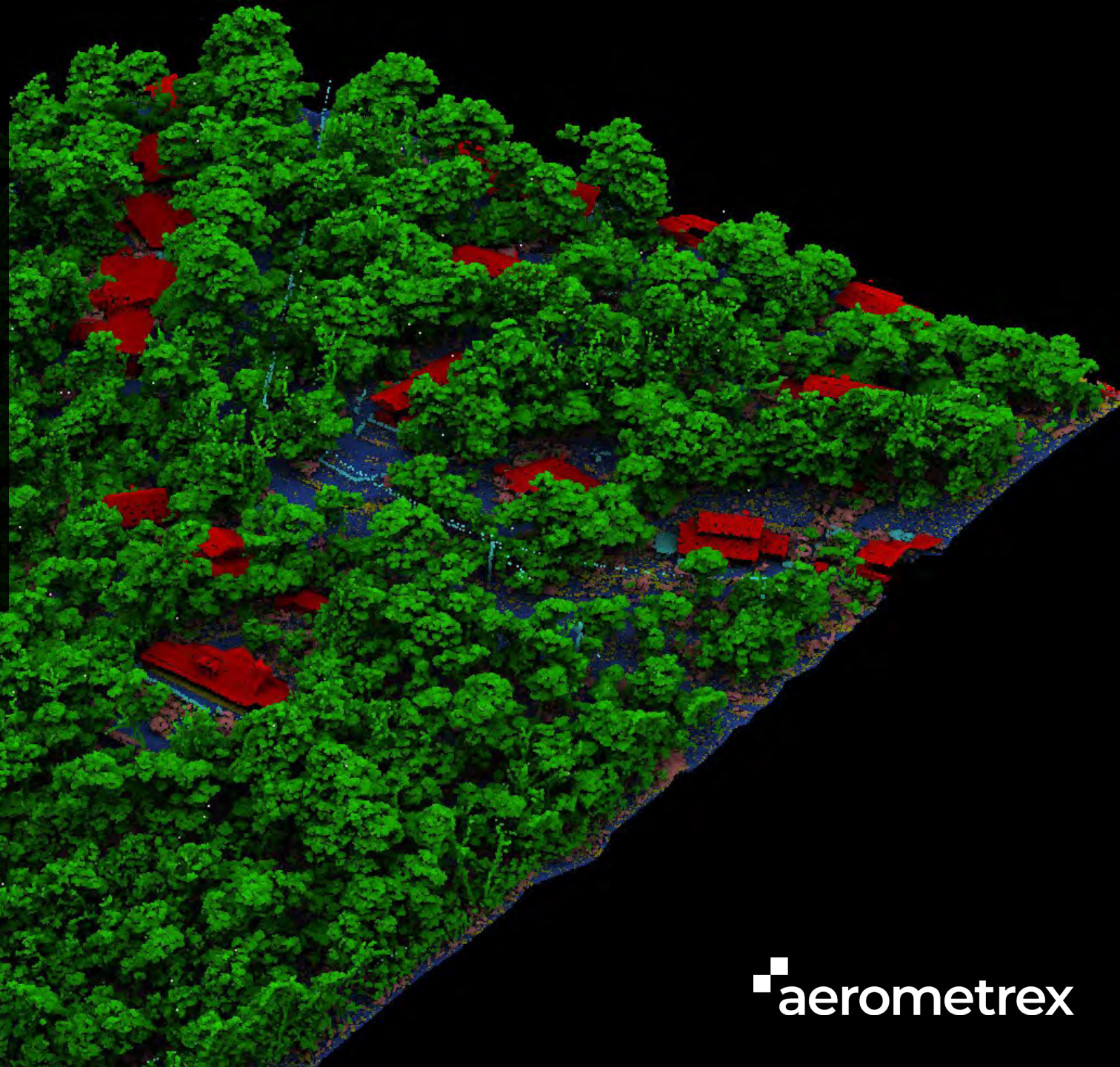


- Commercialisation ready
- MetroMap compatible layers

Total Area	Canopy Coverage	Plantable Space	Urban Grey Space
316 km ²	24%	43%	26%

BUSHFIRE FUEL LOAD MAPPING

- How much fuel is there
- Where is it located
- What is its vertical structure



BUSHFIRE FUEL LOAD MAPPING

The project had two key objectives:

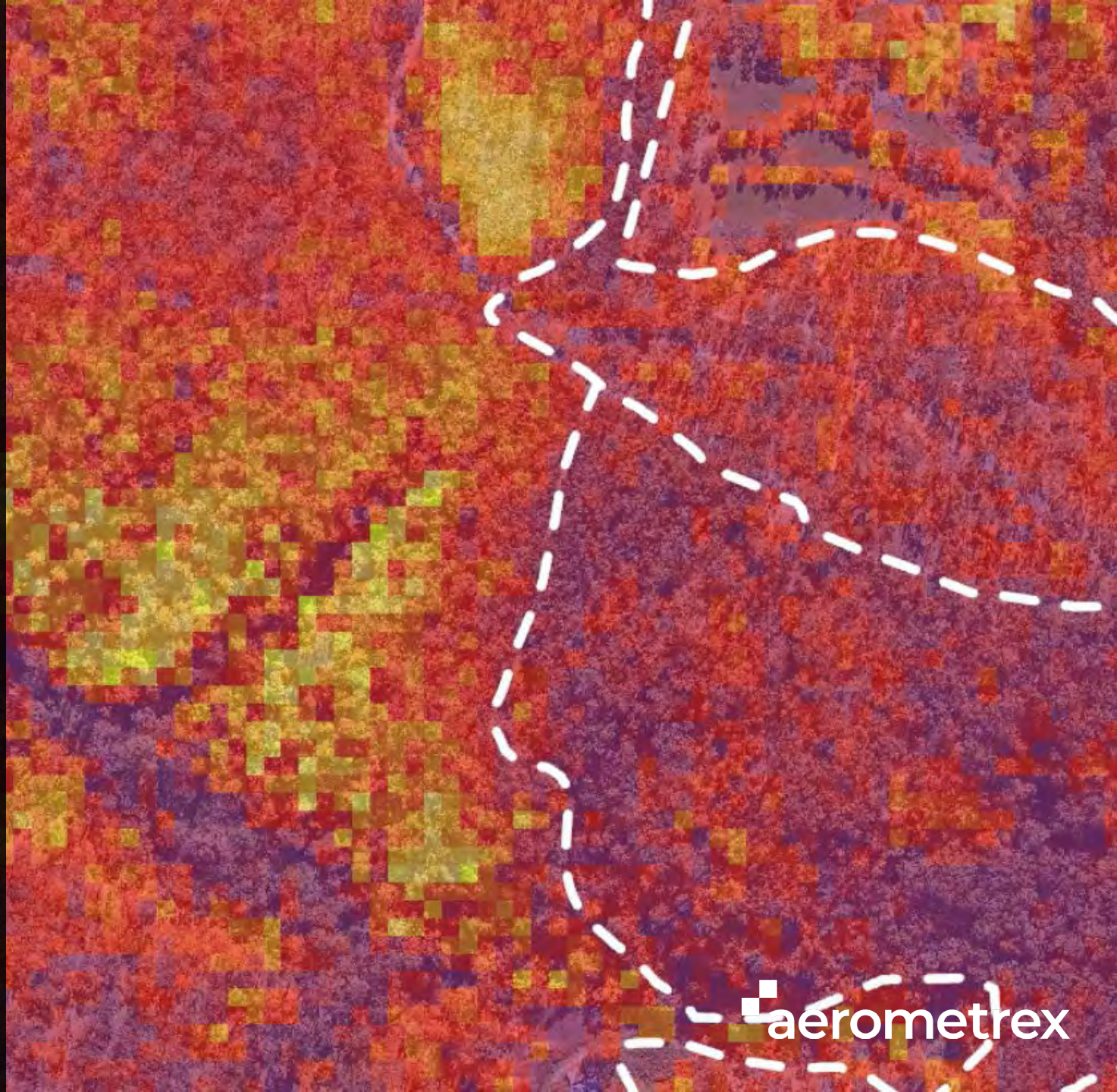
- Develop an optimised LiDAR capture method specifically aimed at quantifying bushfire fuel loads
- In conjunction with fire experts, develop a calibrated methodology to produce robust, accurate fuel load metrics across large areas of interest.



BUSHFIRE FUEL LOAD MAPPING

The project had following major deliverables:

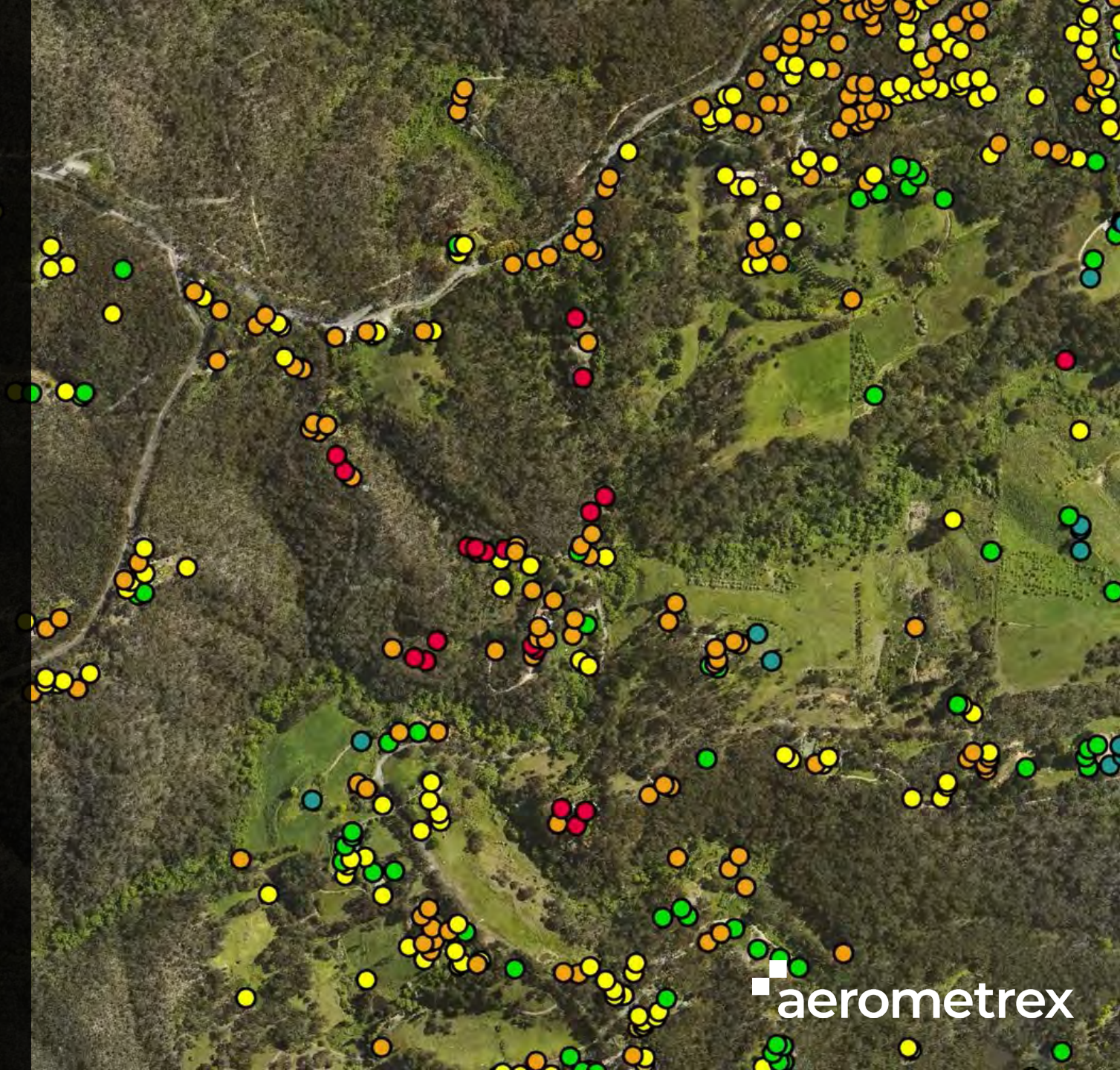
- Fuel load density
- Fuel load vertical connectivity
- Tonnes per hectares



BUSHFIRE FUEL LOAD MAPPING

Property specific bushfire fuel load attributes can be derived to help manage developments on high risk areas.

- Tree Canopy Overhang
- Proximal Near Surface Fuel
- Proximal Elevated Fuel
- Proximal Average Slope
- Proximal Fuel Rating (shown in image)





THANK YOU

For further information, contact as below:

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W: <https://aerometrex.com.au/asx-announcements/>

MetroMap: <https://metromap.com.au/>

This presentation has been approved by the Board of Aerometrex