

Presented at the FIG World Survey Week 2025,  
6-10 April 2025 in Brisbane, Australia



# Transport Infrastructure Interactions: Digital Twin Simulation for Automated Accessibility Assessment

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**Can Mobility  
Aided Lifts  
(MAL) be  
deployed at  
existing tram  
stops?**

**Prove using  
Digital Twin...**

# Vehicle mounted sensor platform

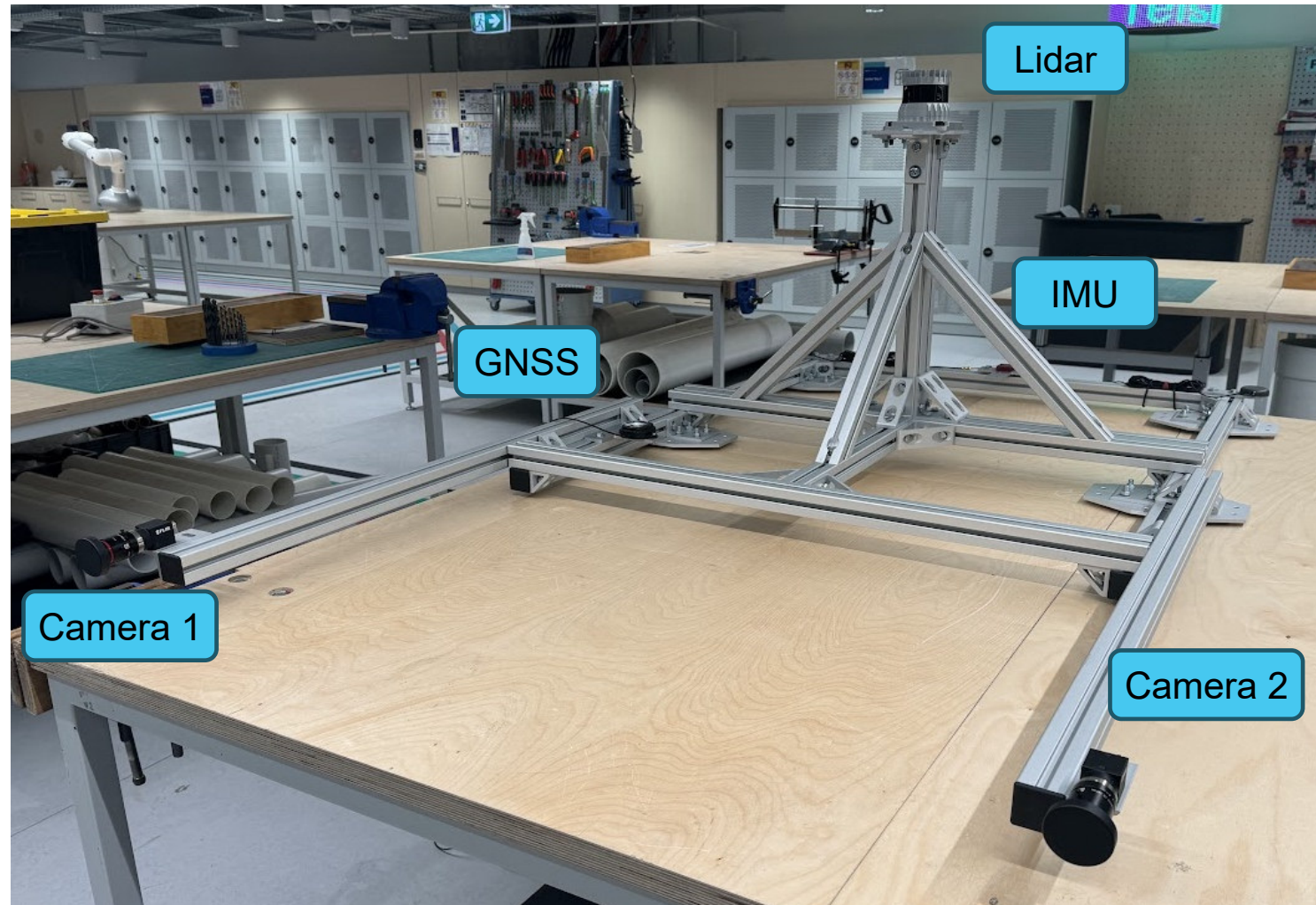


## Sensors

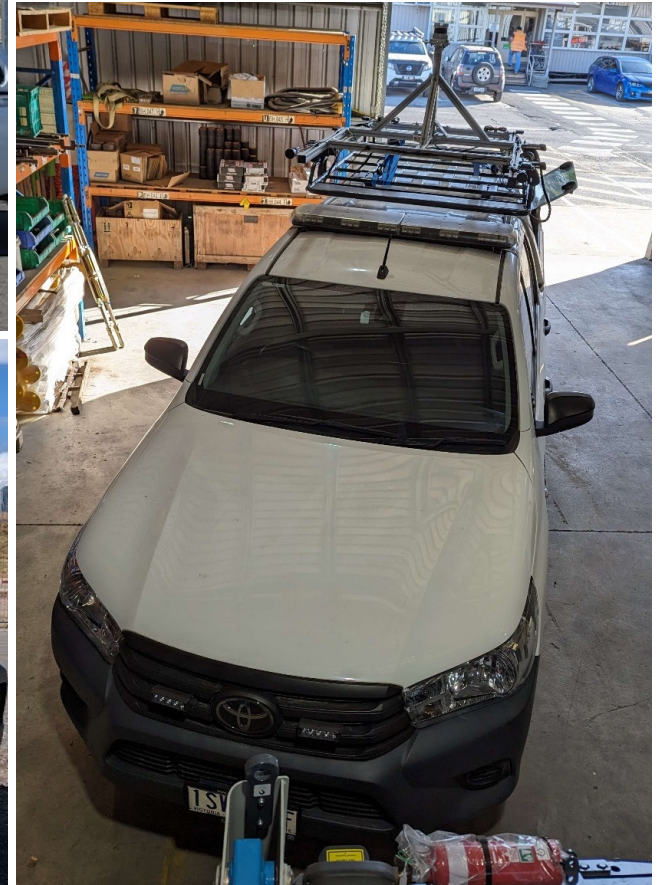
- UBLOX F9P GNSS
- VectorNav VN-300 INS
- Ouster 128 Lidar
- 2 Wide-angle Cameras

## Robot Operating System (ROS)

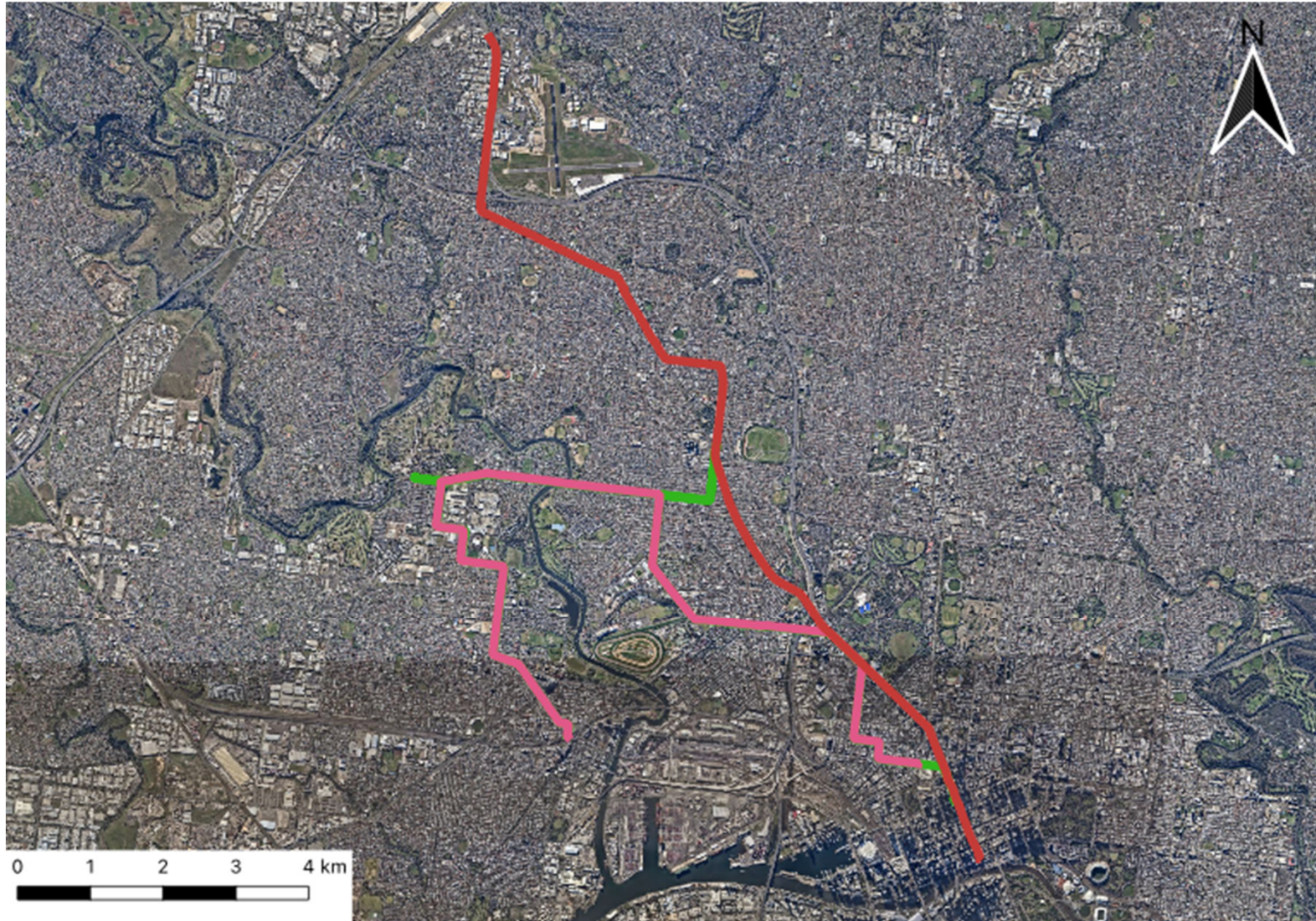
- Sensor drivers
- Synchronisation
- Data recording
- Data playback



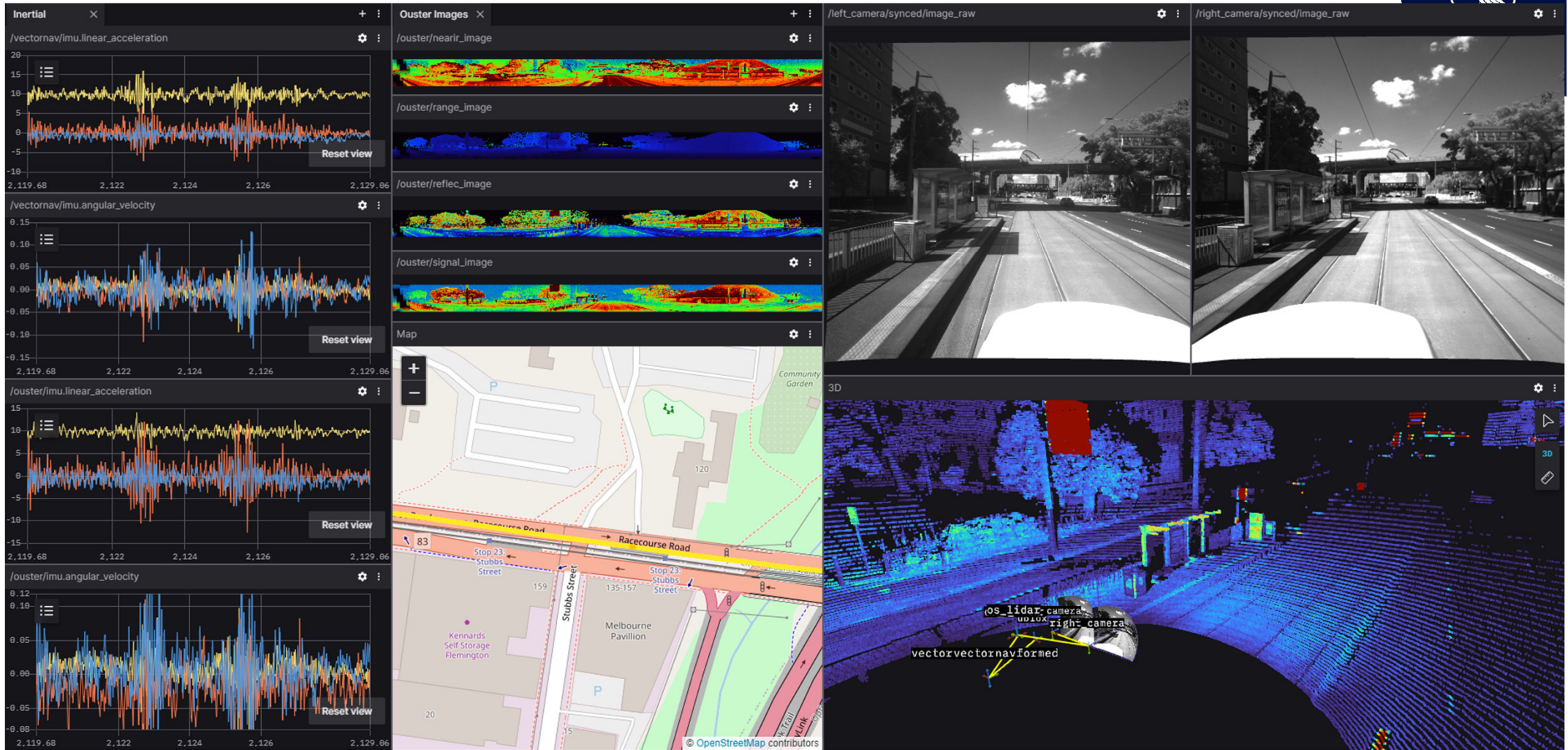
# Vehicle mounted sensor platform



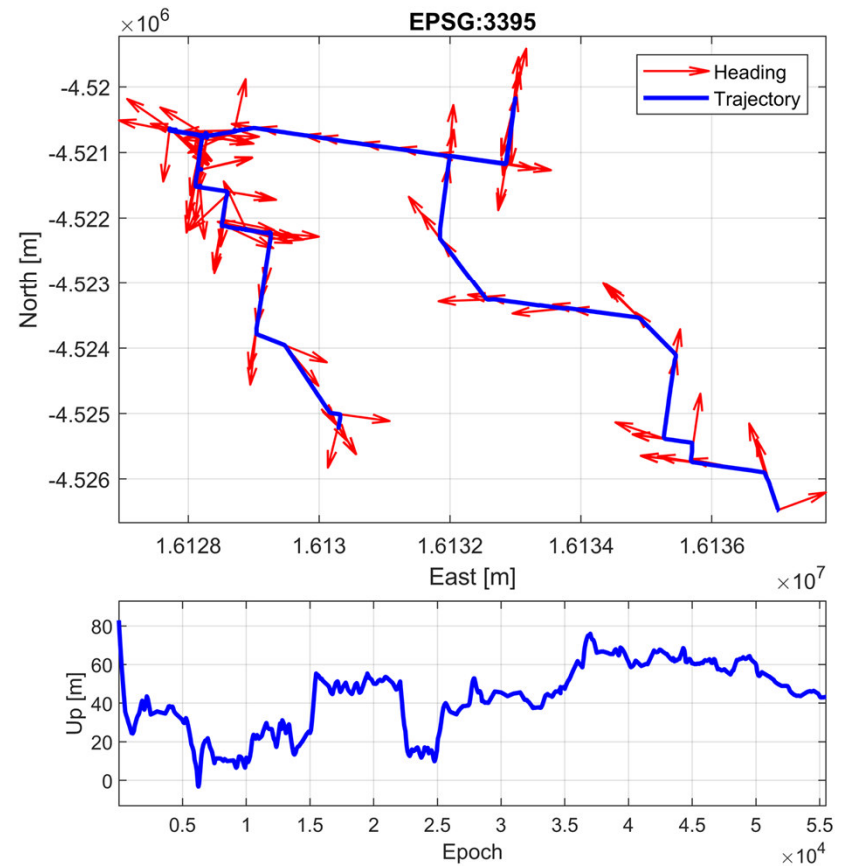
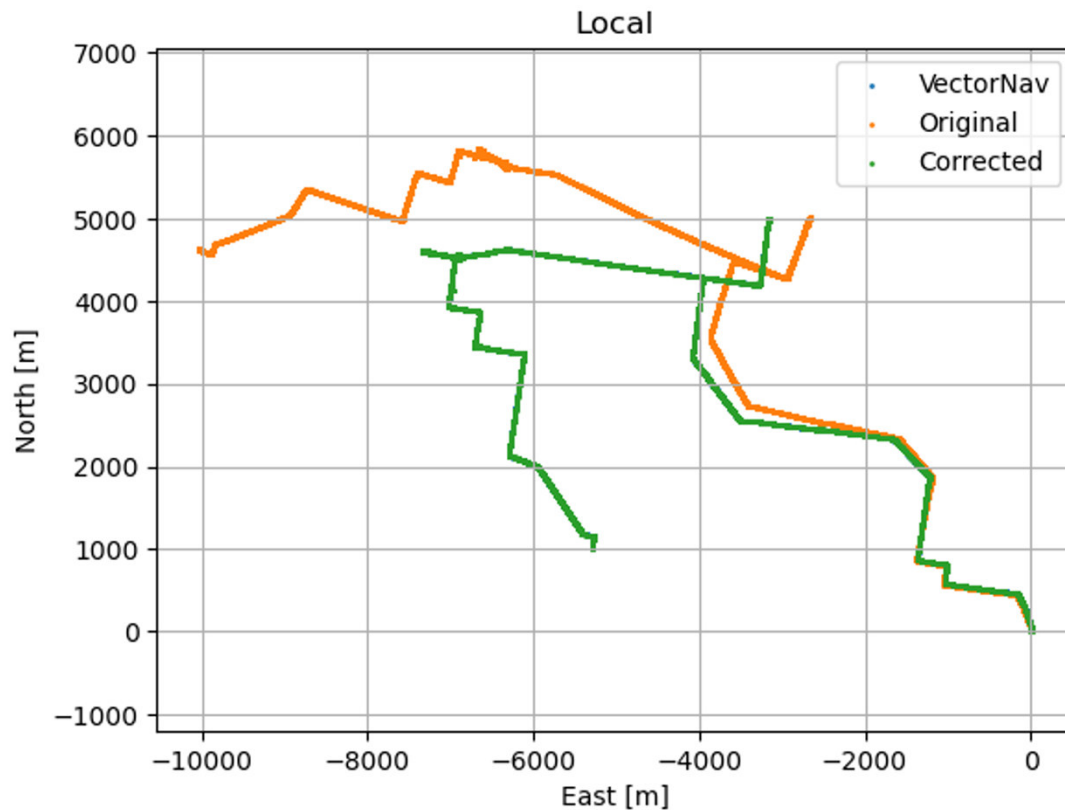
# Data collection of 3 tram routes (80km, 3 days)



# Data (8TB)



# Georeferenced mobile point clouds



# Georeferenced point clouds (10GB copc)

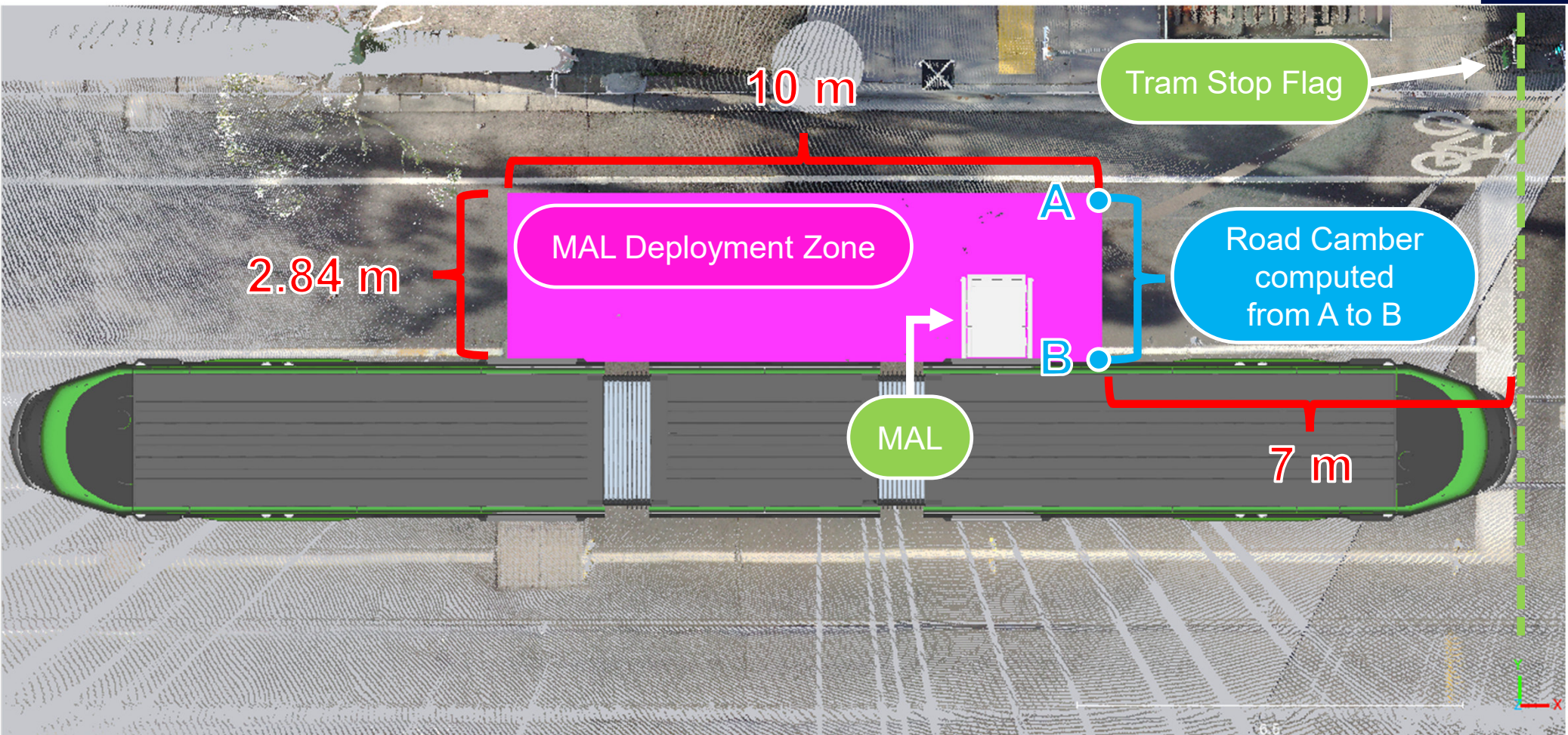


The screenshot shows the Hobu web interface. On the left is a sidebar with icons for data management, search, and collections. The main panel is titled 'Data' and contains a 'Point clouds' section with a list of three datasets: 'drive\_2\_14032024\_7855', 'drive\_2\_14032024\_7855\_dense', and 'drive\_1\_15032024\_7855'. Below this is an 'Add' section with a '+ Add data' button and a dashed box labeled 'Drop COPC file or STAC collection'. Further down is a 'Collections' section listing 'USGS 3DEP LiDAR', and a 'Sample data' section listing 'Autzen Stadium', 'SoFI Stadium', 'Millsite', 'Hobbs, NM', 'Red Rocks Amphitheatre', and 'Trestle Bridge'. The right side of the interface displays a satellite map of a city area with a blue point cloud overlay. The Hobu logo is in the bottom right corner of the map area.



# Data inspection and measurement tools

# Simulated tram stop, tram & MAL



# Web-based data visualisation application



Select a tram route: Route 57 towards Flinders !  
Select tram stop type: Reserve stop  
Select classification: Feasible  
Select a tram stop: Stop 29 Ascot Vale Rd & Racecourse Rd

Play Replay Pause

Left Camera Right Camera

## Stop Information

Stop Number: 29

Route: 57

Tram Tracker ID: 1329

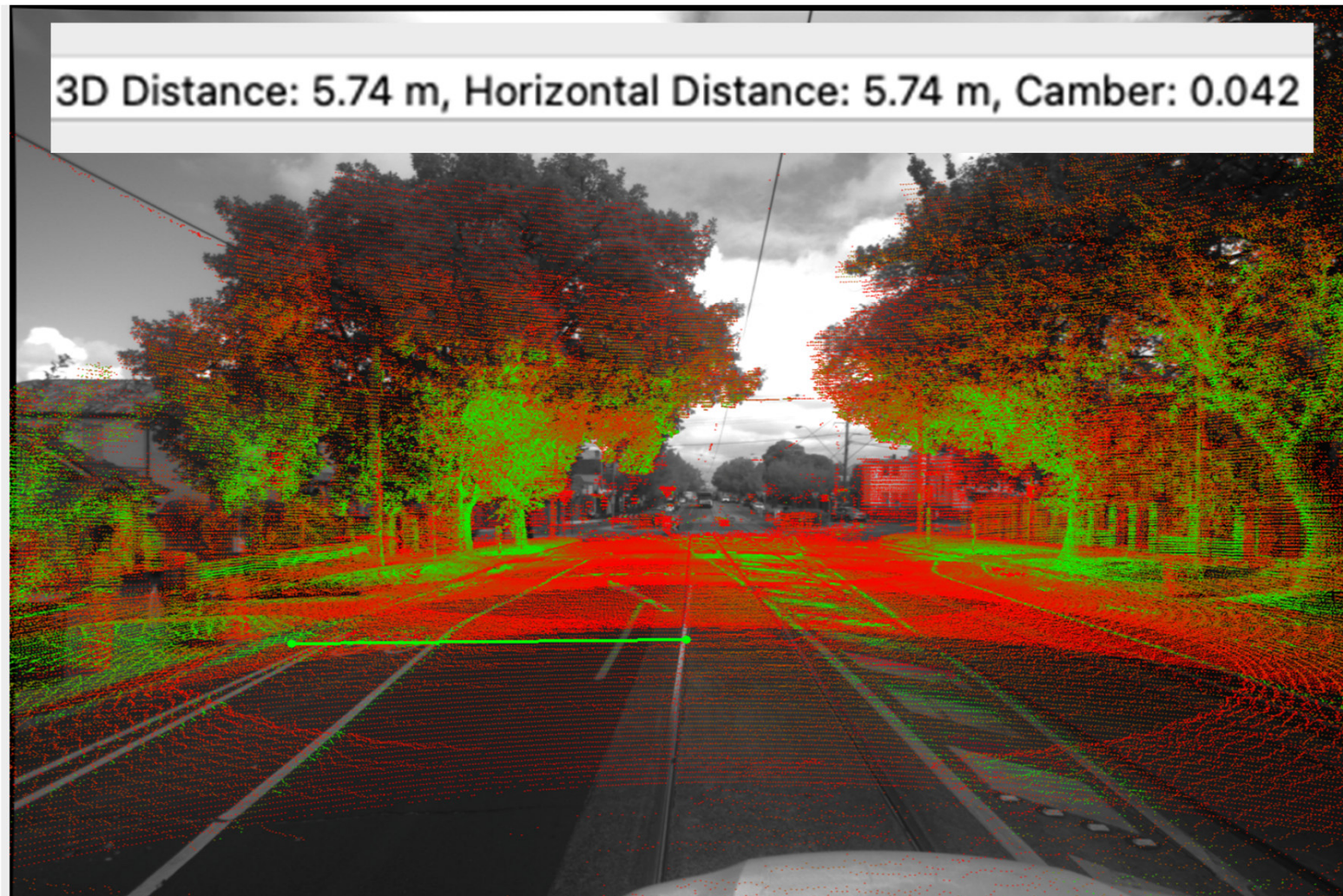
Track: Embedded

Street Name: Ascot Vale Road

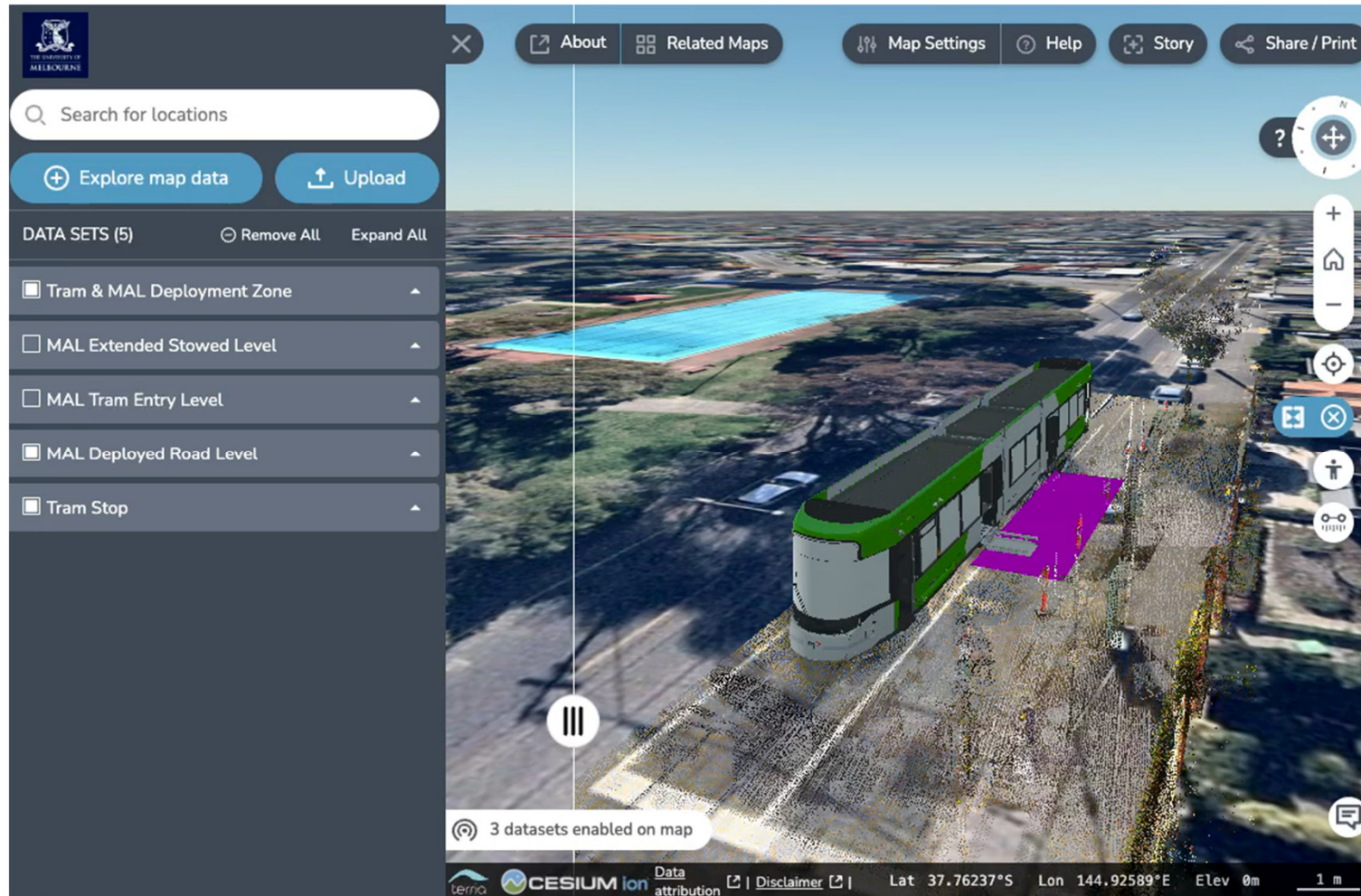
Stop Name: Stop 29 Ascot Vale Rd & Racecourse Rd

Route Direction: Up to Flinders St

# Image-lidar measuring application



# Simulated tram stop, tram & MAL





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MELBOURNE

# Thank you!

**9** INDUSTRY, INNOVATION  
AND INFRASTRUCTURE



**10** REDUCED  
INEQUALITIES



**11** SUSTAINABLE CITIES  
AND COMMUNITIES

