METRO

March 2025

RISSB Masterclass Webinar

People Movement Analytics Operational Trials

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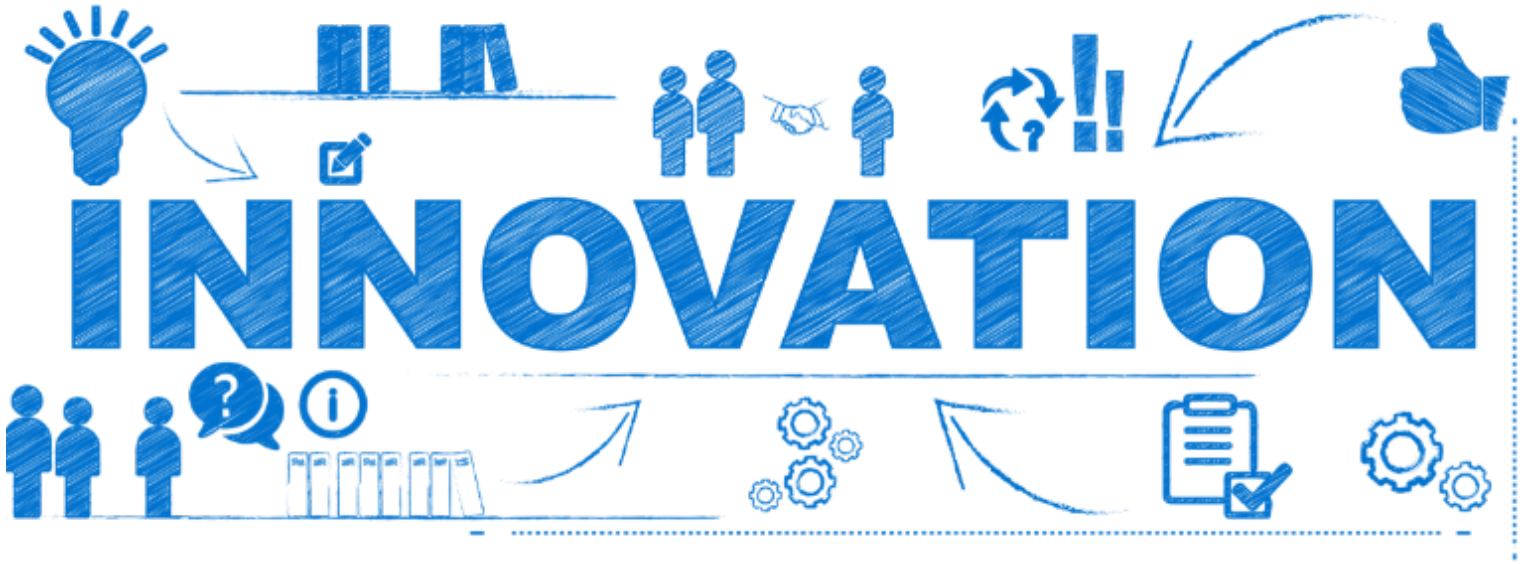
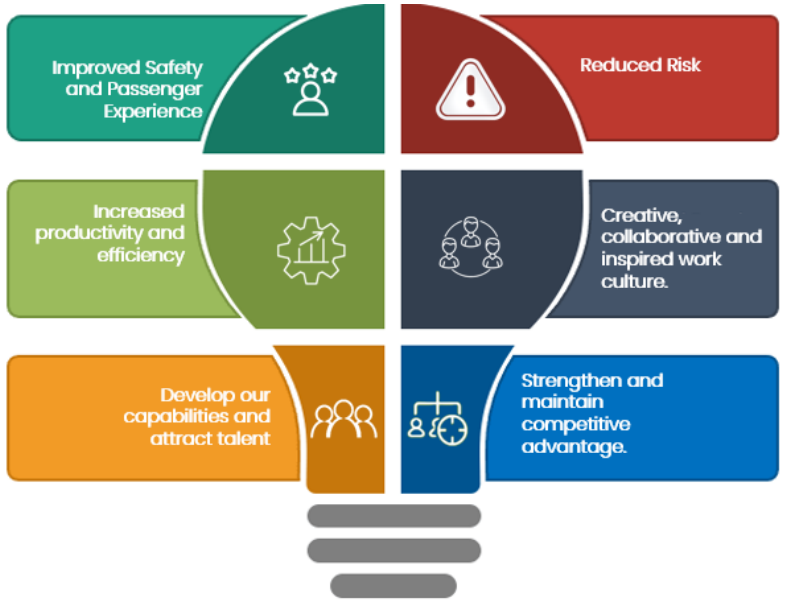




Working as **one team** through **disciplined creativity to** develop **novel solutions** which deliver **value.**

People Movement Analytics

*Providing real time information to help **mitigate** passenger **safety risks at stations***

Why People Movement Analytics?

Crowd Management

Passenger movements on platforms can impact **overcrowding** and **trespasser** incidents.

Current crowd levels are estimated by sight, this can be **inaccurate** and **varies** between people.

Overcrowding may cause passengers to unintentionally fall into the rail pit which can result in **serious injuries and fatalities.**

Trespasser Management

Trespassing can **enter the network** from the end of platforms **undetected** until seen by a driver which can be **some-time later**

This results in the need to **stop** all trains in the vicinity of the incident location

Causing mass **disruption**, especially in the inner area.

Impacting our **Passengers** and **Our People**

1. Support operational staff in managing platform crowding during peak times and special events

2. Support our Strategic Trespasser Program by developing solutions that can be applied at hotspot platforms

LiDAR Technology

People Movement Analytics uses Light Detection and Ranging (LiDAR) technology at key stations connected to an edge-based server located on the platform.

Specially-installed sensors capture passenger density on platforms, monitor crowd levels and trespasser events.

People response

Provides real time feedback to station staff, to support data-driven decision making about passenger safety and crowd management.

Can also be used to identify trespassers encroaching on the rail network, though cannot be used to identify individuals.

Installed at Parliament Platform 4 and Richmond Platforms 9 and 10

Developing the Solution

Cloud based

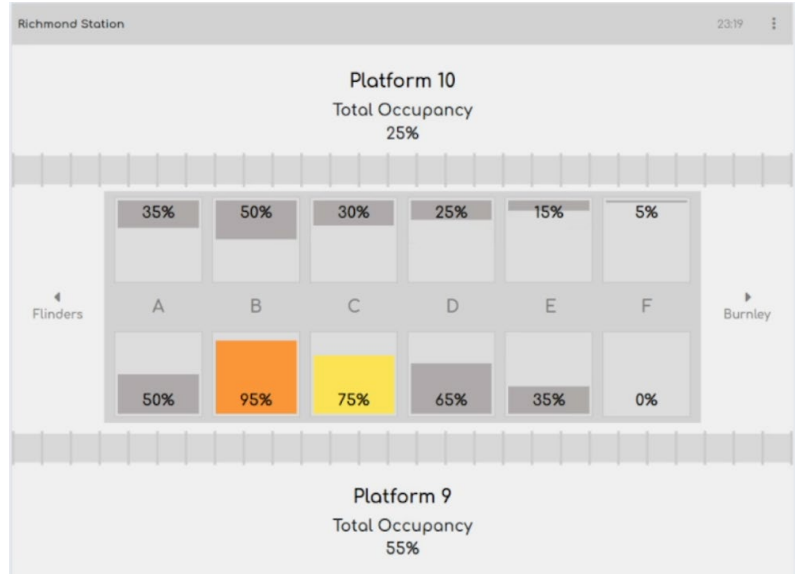
Lidar driven

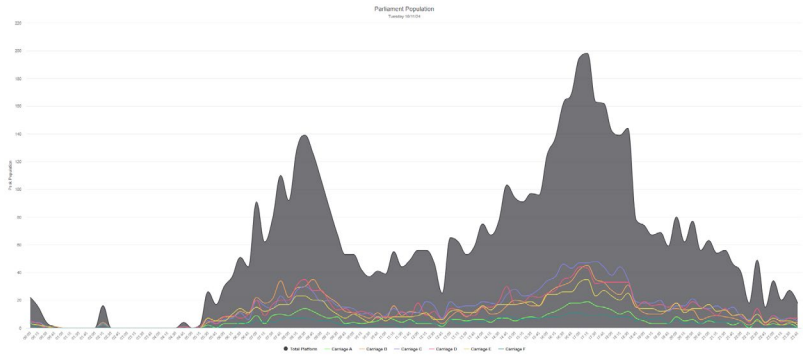
One Team

Human centred HMI design

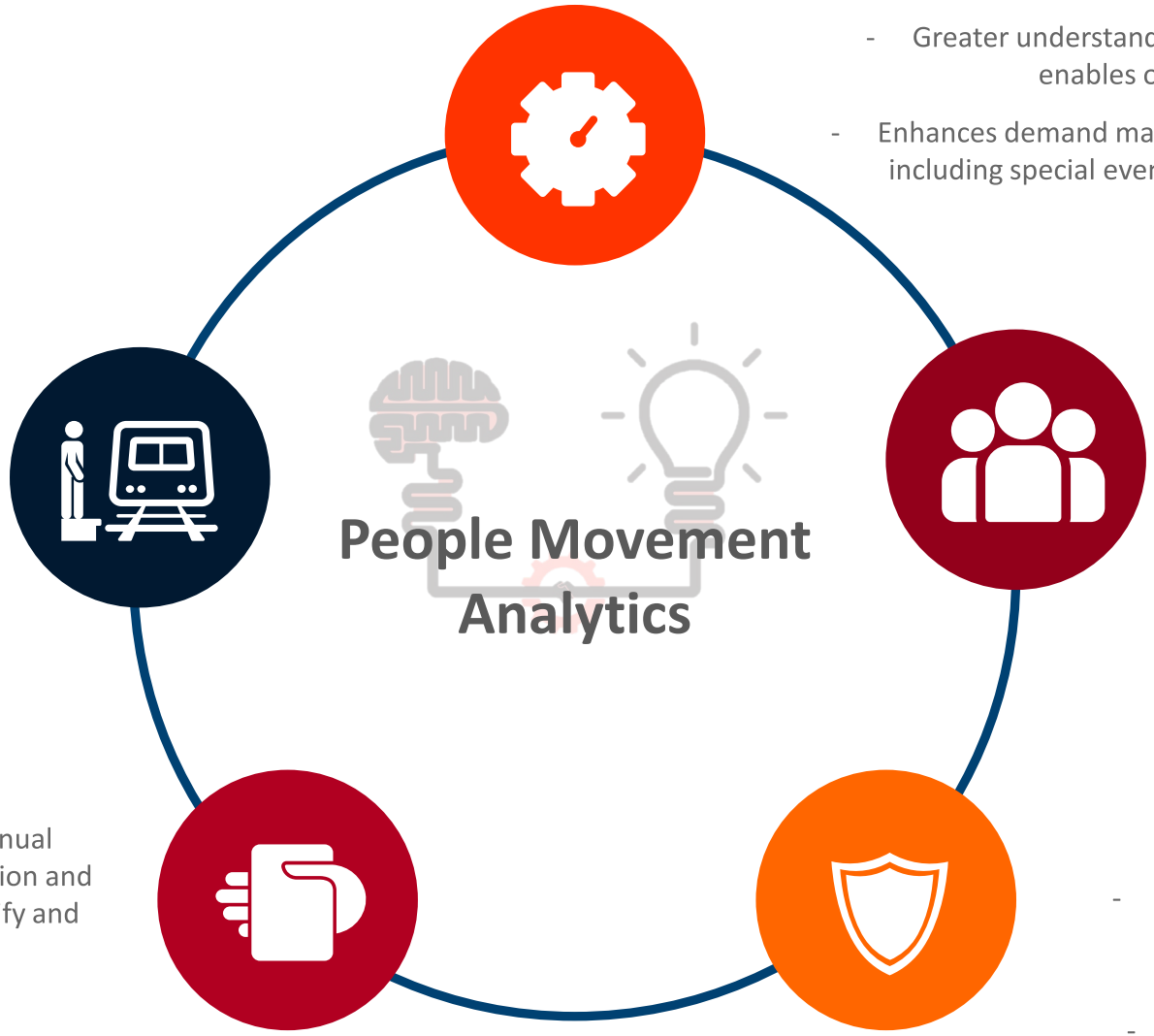
Real-time accurate information

Providing real time information to help ***mitigate passenger safety risks at stations***





Key Benefits



Special Services

- Greater understanding of passenger flow patterns enables optimisation of train schedules.
- Enhances demand management during peak periods including special events by calling in additional train services.

Platform-Edge Safety

- Safety risk profile improvements through reduction of overcrowding and optimised passenger distribution on platforms.
- Detection of unintentional pit entry, allowing quick response and stoppage of trains if required
- Real time detection of yellow line breaches

Platform Overcrowding / Block & Hold

- Data able to be analysed by machine learning algorithms resulting in informed predictions on peak crowding times, patterns, and locations.
- Highlighting areas of potential bottle necks or likely overcrowding enables operations to proactively deploy staff to strategic locations or implement crowd control measures

Trespasser Incidents

- Automated trespasser alerts and continual crowd density monitoring enables station and control room staff to proactively identify and quickly respond to emergencies

Platform Distribution

- The system helps ensure total platform coverage and therefore overcomes blind spots that are apparent with current processes.
- Proactive announcements can be made by staff informing passengers of space along the platform

Tools available in the field

- Staff have been supplied with a tablet (iPad) loaded with custom UI to provide real time information to inform operational decision making

- Tablets have also been installed at the Station Control room and platform booths. In addition to this, a mini-iPad (roaming) is used on the platform during Special Events. (hard wired to ensure < 2sec Latency)

Training and upskilling our Team members

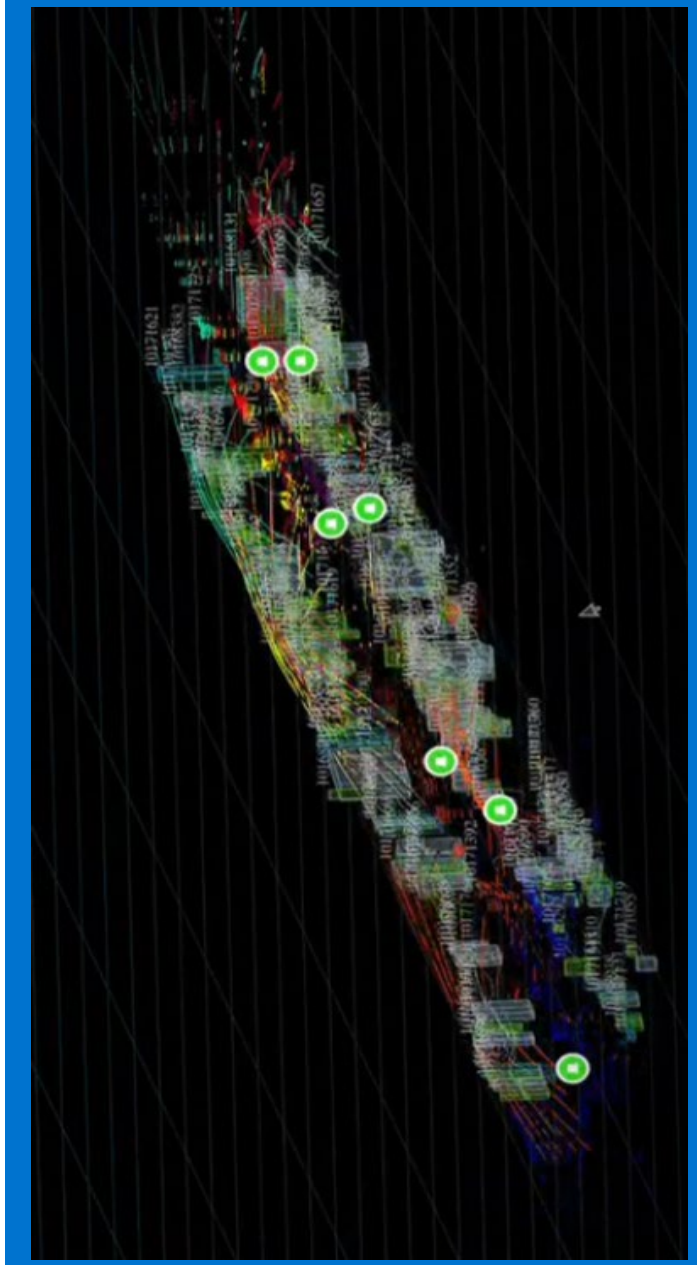
- Training modules have been developed: **Crowd Management** and **Trespasser Detection.**

- Training modules are available via the MTM online portal for easy access and tracking.

Status Update (March 2025)

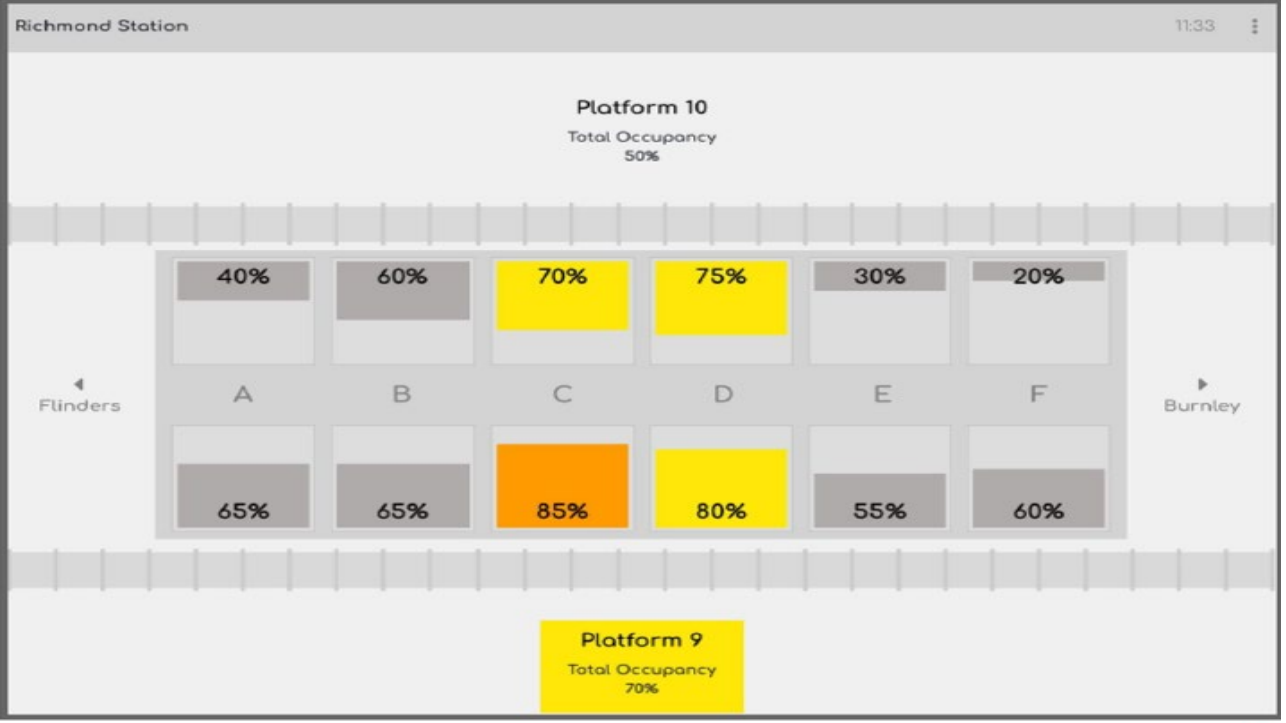
Trialling the technology

- Operational trial running for a period of 12 months at 2 key stations.
- Crowd Management solution continues to perform well at Richmond and Parliament since it was deployed in Sep-24.
- Trespasser feature went LIVE at Parliament station in Feb-25 and continues to perform well following various system changes.
- Trespasser feature is being validated at Richmond and planned go LIVE in the second half of March pending zero false positives being reported.
- Validation approach consists of the Team manually validating reported detections against MTM CCTV footage.



In action:

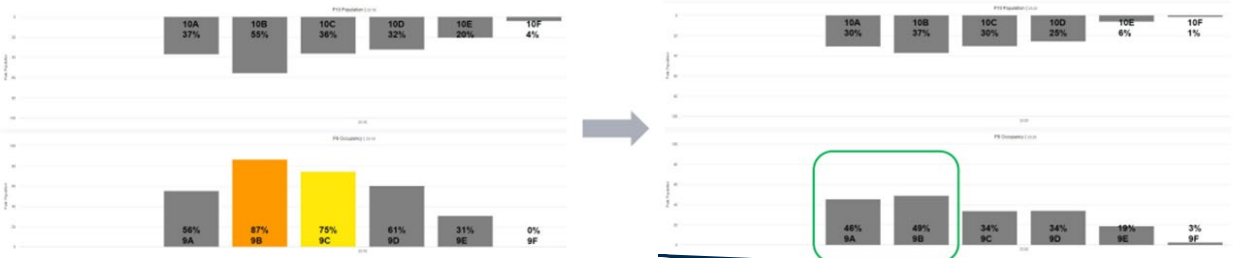
Crowd Management



Findings & Refinement

- Platform occupancy divided into six zones to represent each train carriage.
- Platform occupancy indicators change under the following conditions: turn yellow if occupancy >=70% and orange if occupancy >=85%.
- Platform occupancy was validated in Sep-24.

Informed decision-making enabled staff to bring platform zones to a safe population level in less than 1 minute



From this...

To this...

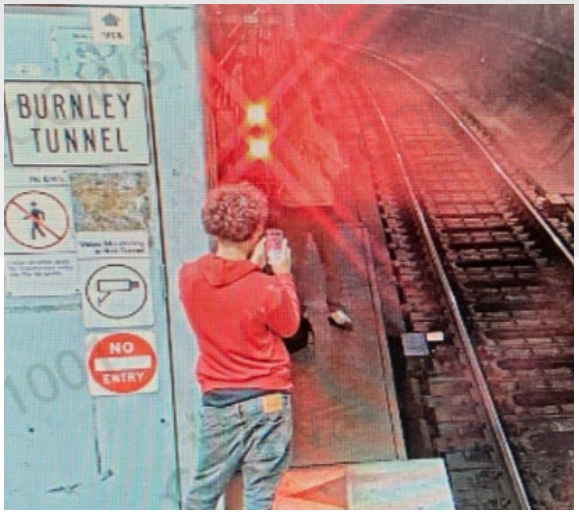
Case Study – AFL Finals

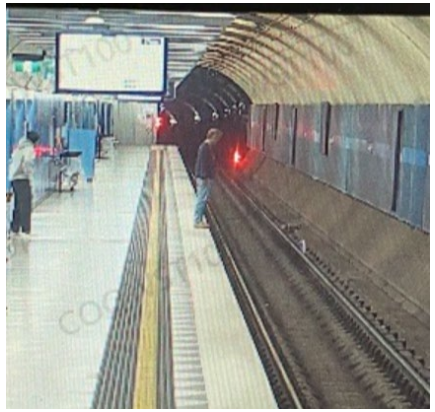
- Special Event, Fri 21st Sep-24, AFL Qualifiers Western Bulldogs vs Hawthorn:
- Authorised Officer Team members provided positive feedback
- No need for Block & Hold.
- Great collaboration with Station staff and Rail Incident Commander.

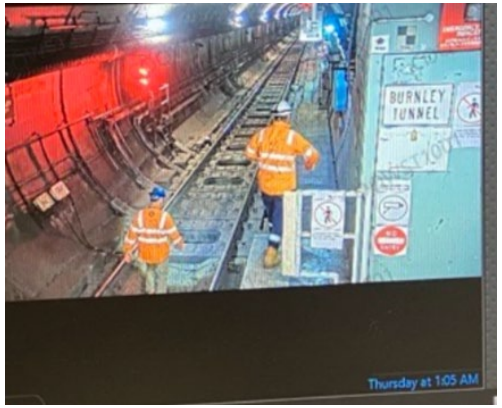
Authorised Officers utilised the tool to manage passenger flow in real time even out passenger load along the platform. This avoided the need for a block and hold.

In action:

Trespasser detection







Findings & Refinement

- Identified and categorised several types of trespassing behaviours.
- Identified areas of concern; for instance, at the end of the platform.
- During the validation process, the team came across several challenges such as reflections, size and speed of objects, birds, etc.
- System designed to alert station staff on trespassing detection (visual and audio).

Case Study – Parliament Station

- System continues to perform well.
- For passenger on the edge of the platform or at the end of the platform, positive feedback has been received from Station staff as they are now alerted of these potential trespassing events.
- Alerted staff subsequently made an announcement which resulted in the breach being safely cleared in short duration.

Fact Based Planning and Decision Making

Trespass Alarms

Trespass Alarm ⚠ :

Daily Peak Population

Max : 86

Avg : 41

Passenger Wait Time

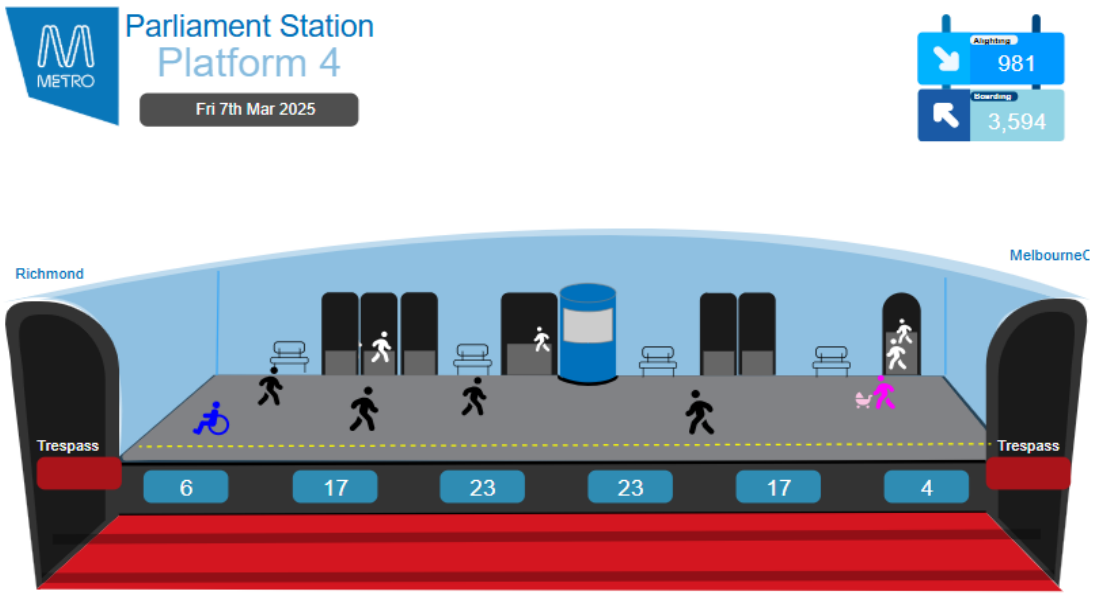
Avg : Minutes

Coming Soon

Thu 07/11/24 Parliament P4 Train Dwell

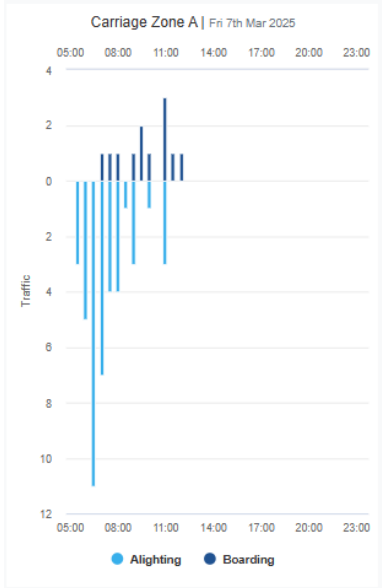
Max Dwell : 2m 12s

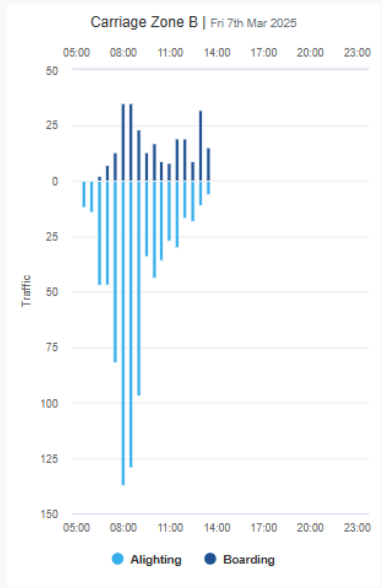
Avg Dwell : 1m 9s

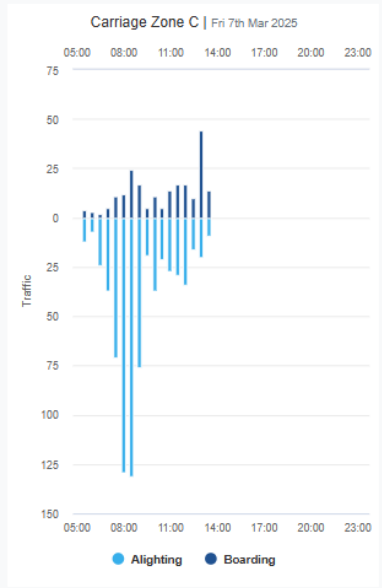


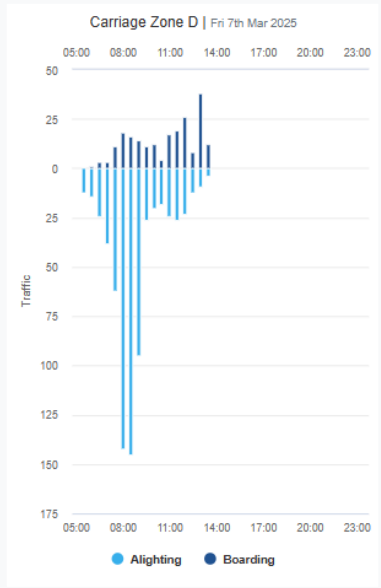
Operational and Strategic

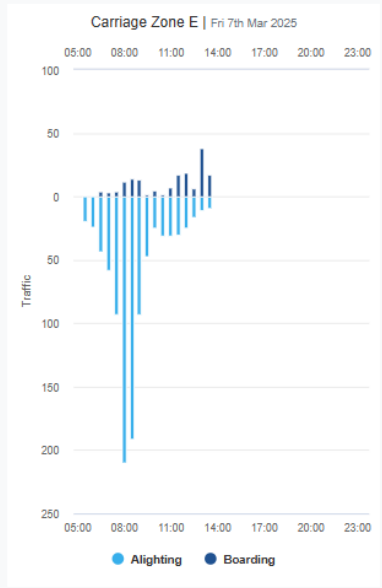
Passengers Boarding 4A Train	Passengers Boarding 4B Train	Passengers Boarding 4C Train	Passengers Boarding 4D Train	Passengers Boarding 4E Train	Passengers Boarding 4A Train
12	258	218	218	169	106

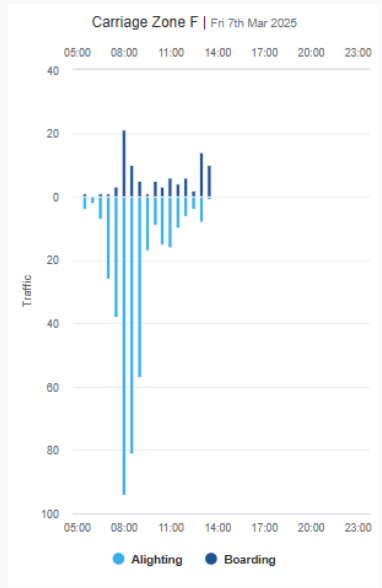












Passengers Alighting 4A Train	Passengers Alighting 4B Train	Passengers Alighting 4C Train	Passengers Alighting 4D Train	Passengers Alighting 4E Train	Passengers Alighting 4F Train
43	790	699	694	959	409

What's Next?

a. Further deploy at select stations to support peak times and special events

b. Explore potential to apply similar solutions **in section**

c. Trial enhanced LiDAR technology

Thank you!

METRO