

Innovation

In the world's largest
legacy tram network



Yarra Trams

- World's largest tram network with over **250km** of shared track, **480** trams, **1680** stops and **74%** of the network is shared with other road users
- Completing **200+ million** trips each year and operating for over **100 years** the network would cost at least **\$20billion** to rebuild today.
- Yarra Trams have over **2400** staff and operate **9** different classes of tram with production dates ranging from the **1920's** through to **2022** and a Next Generation Tram under development.
- Melbourne is Australia's fastest growing capital city with its population expected to grow from **4.5 million** to **7.9 million** by **2051**. To accommodate this population growth the network will need to cater for around **10 million** more trips per day – an increase of more than **80%**.



What is Innovation

- *Innovation needs to be tailored to each organisation*

- Innovation without strategy leads to failure

Purpose of innovation at Yarra Trams

1. How will innovation efforts support the overall business strategy.
2. How will these efforts create value for passengers and how will YT capture this value for DTP

Yarra Trams' innovation strategy

- Best in market - Incremental innovation
- Innovation to production



Successful innovation requires information, input and effort from diverse contributors with a sense of collective responsibility

Fostering Innovation at Yarra Trams

Innovation as a Service



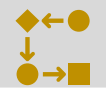
Conduit to external innovation through relationships with universities and global partners



Identifying innovation opportunities and conducting high level feasibility analysis



Facilitation of innovation workshops, incl HCD, Design Thinking and agile sprints



Support throughout the Innovation initiative lifecycle



Formalised progress reporting to Chief Executive Team and other stakeholders



Business As Usual (BAU) transition support throughout handover

Allied external partners

- A focus on working closely with partners that are best in class and support a shared vision
- Continual transparency with DTP and stakeholders throughout projects



Innovation Squad

The innovation squads undertook a human centred design approach in determining the problems Yarra Trams should focus on

- User personas
- Journey mapping
- Themes
- Problem statements
- Concepts

Problem Statement: *How might we ensure an equitable, safe, consistent and reliable experience for all passengers to choose trams over other modes of transport.*

Concept: *Making kerbside stops more visible particularly at night for driver awareness and passengers feeling of safety*

Discovery: *Consulted with the DTP's road safety team, market assessment and meeting with potential suppliers*

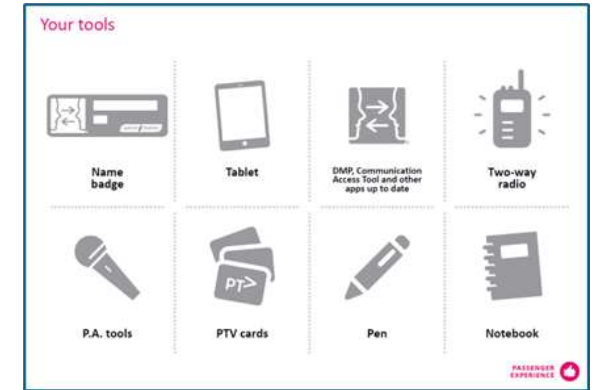
Proposal: *A trial of a low-cost solar light solution at 10 locations*



Identifying and interpreting business challenges at the 'coalface' ensures we're not insulated from finding the real challenges

Keolis Signature Service

- *KSS gives our staff the skills and tools to be the best part of the tram experience for our passengers.*
 - 350 staff were engaged with the design of the program which is based upon the Keolis framework, utilising a human centred design approach
 - Passengers identified that staff being courteous and helpful is their highest priority in a journey
 - Built on the principle that every day, our frontline has the opportunity to turn a bad experience into a good one, through an open presence, a kind word and a helpful manner
- *Complaints regarding staff behaviour have dropped 31% and compliments have increased 38% between 2019 & 2022*
 - Training involved employees and managers together
 - Supported by improved tools, ongoing toolbox talks and assessments
 - Rather than consider this project as completed, we continue to make improvements to the network to enable our frontline to improve their performance



“His interaction with the passengers from when they boarded the tram until they got off was really good. He was funny, informative, friendly, made sure he was heard when giving information and was just very professional in all that he did.” (Driver)



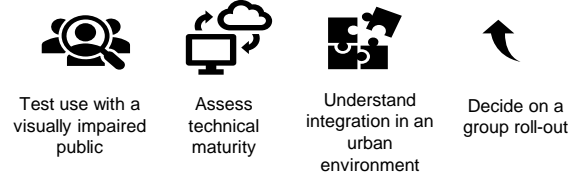
Keolis international Expertise

NaviLens @ Versailles experiment

Tested innovation

- + NaviLens is a patented **augmented QR code** that can be scanned from great distances and from multiple angles (up to 160°). The user uses their phone camera to scan their surroundings and thus obtains information via voice over or on the screen
- + The 'NaviLens GO' application is designed for all users, rendering information in **augmented reality** and in **33 different languages**
- + Each QR code stores its own information. This can be **static** (indication of location, direction, name of the stop, lines etc.) but also **dynamic** (real-time tram arrival, disruption, events, etc.)
- + The app systematically and continuously voices the distance and angle between the user and the scanned code, making it possible to improve orientation

Objectives of the experiment



Targets

Vulnerable passengers



Visually impaired



First-time travellers (CALD, tourists etc.)

Scope of the test

Intermodal route



Bus station



Departure platform

Mid-April 2021 → July 2021



Experiment findings

1. NaviLens technology works and is proven by users
2. The use of the NaviLens solution at the stopping point is also validated by users. It provides access to information that was previously inaccessible to those with low vision or who are blind (next arrivals in real time and identification of the vehicle on approach).
3. NaviLens is validated as an augmentation to guidance in environments equipped with tactile guidance strips
4. The solution needs to be learned by the users, hence the need to continue to work closely with local associations including our ARG
5. NaviLens remains a digital solution that can never compensate for a deficient physical infrastructure



International Rollout

Murcia: deployment of NaviLens technology on the entire tram network (28 stations, 11 five-carriage trains)

New York: Jay St. station (3 metro lines) accessible, second experiment to make all stops of a bus line in Manhattan accessible

Barcelona: accessibility of the entire bus network (2400 stops) and metro (159 stations)

Madrid: accessibility of the entire Autonomous Community network (7000 stops)



NaviLens code at Jay St. MetroTech Station entrance.

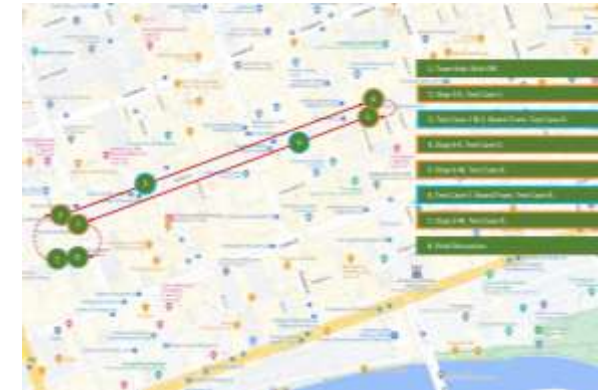


Real-time information scanning the code far away.

94% of users stated they located elements thanks to NaviLens which they had not been able to find previously
88% is completely in favour of NaviLens being installed in more areas of the network for use in public transportation. 12% are very much in favour

NaviLens in Melbourne

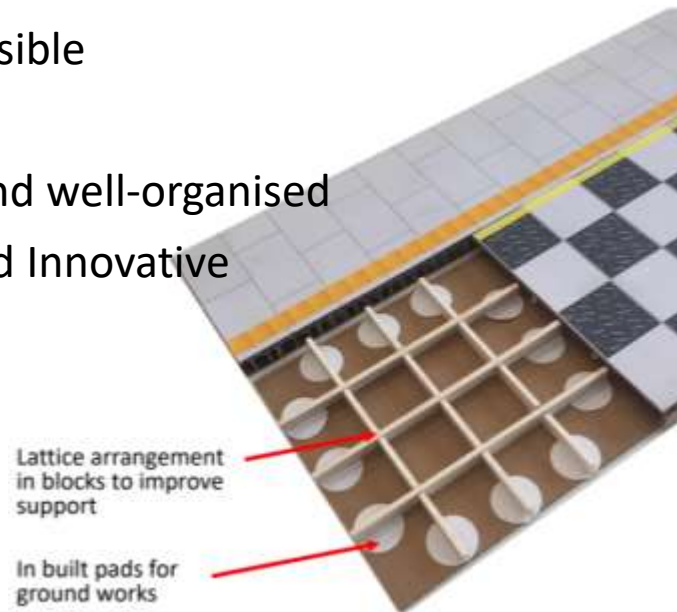
- *Yarra Trams has now completed a first trial of NaviLens with members of our Accessibility Reference Group, under live conditions on the network, providing valuable lessons:*
 - Length of Messages, Word Usage & Sentence Construction
 - Placement of codes
 - Intended Use & Real World Applicability
 - App Settings & Usage
- *A secondary fully functional live network trial launched in April and run until the end of the year, focusing on:*
 - Testing the full experience
 - Outfitting route 96 with codes at all stops on different infrastructure
 - Installing codes on the interior and exterior of all 100 E-Class trams
 - Integrating NaviLens with our back-end Tram Tracker API
 - Providing passengers with “This Stop”, “Next Tram”, “This Tram” & “Next Stop” information



“This is amazing, and this will make it easy for me to get trams!”

Hollow Stop

- Monash University's Institute of Railway Technology in partnership with Yarra Trams, Integrated Recycling and Advanced Circular Polymer was awarded a Sustainability Victoria grant to develop ways to turn recycled plastic into components for the construction of tram stops.
- **Design Principles**
 - Safe and Accessible
 - Integrated
 - Comfortable and well-organized
 - Sustainable and Innovative



Kerbside recycled plastic could soon be used to build tram stops in Melbourne. (Supplied: Yarra Trams)

- "It can be easily installed without a significant disruption to traffic flowing through those tram stops, which are generally used by trams as well as road users."
- – Director Institute of Railway Technology Ravi Ravitharan

Thank you

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