Monash Institute of Railway Technology (IRT)

- Railway research capability was established in 1972
- Successfully conducting applied railway research since 2000 at Monash University
- In 2016, Monash IRT was identified as the premier track and vehicle research centre in Australia
- Fully funded by the railway industry
Monash IRT Snapshot

49 years of railway innovation starting at BHP

21 years as part of Monash University

160+ partners
Since 2000
600+ projects

90+ engineers, scientists, technicians and research associates

World first technologies
- Asymmetric wheel-rail profiles
- Instrumented Ore Car
- Phased array

National and international recognition for staff and projects

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Railway – Sustainable Transport Mode

Monash Institute of Railway Technology has been involved in applied railway research delivering
Key Demographic Trends Relevant to Future Proofing of Rail Infrastructure

Rail is estimated to provide around 62% of urban public transport needs in the future.

Since the year 2000, Australia’s population has grown by more than 25% and is forecast to double by 2070 reaching almost 45 million people.

In 2017, there were 3.8 million (15%) aged 65 and over. By 2057, it is projected there will be 8.8 million older people (22% of the population).

ABS Survey of Disability, Ageing and Carers reported that 50% of men & 52% of women aged 65 and over had some form of disability.

- As the population grows, rail will be the backbone of commuter transport in both dense urban and regional areas.
- Larger portion of people utilising the network will require a greater focus on providing a seamless, safe and efficient access to public transport.
- A portion of the population may have accessibility problems.
Focus for Safe and Inclusive Transport and Mobility

- Significant modal shift from Road to Mass Transit
- Established a multidisciplinary Monash Rail Accessibility Research Group
  - To deliver innovative solutions to improve passenger accessibility in railway networks, including light rail; and
  - To support the railway industry to accelerate progress in finding solutions to deliver improved accessibility to rail infrastructure for all
Contribution to Circular Economy in Railways

- Monash IRT is leading research on Contribution to the Circular Economy through innovative railway products
- Improved Recycled Plastic Railway Sleepers
- Validating material properties of recycled rubber level crossing panels
Develop Next Generation Tram Stop Platforms Using Recycled Materials

Cross section of a Bridge Road EAS

Vehicles can use tram lane

Vehicles and cyclists, driving/riding over easy access tram stop

3.5m  3.3m  3.3m  3.5m

Source: Vic Roads – Easy Access Stops
Digital Rail Engineering

- Vehicle dynamic modelling
- Agent based simulation
- Image recognition
- Rail corridor measurement
- WiFi tracking
- Instrumented Revenue Vehicles
- Integration of MTM data
Instrumented Revenue Vehicle (IRV) Technology

- Autonomous structural health condition monitoring system
- Continuous measurement during normal traffic hours using revenue cars
- Real time reporting of the condition of the track, rolling stock performance and commuter comfort
- Measurements of Commuter-Vehicle-Track System Performance while Moving Passengers Effectively
- Evidence based proactive predictive maintenance activities
Image Recognition & Commuter Movements to Improve Safety
System Approach for Smart Railway Transport

- Railway is a System
- Significant benefits in linking of major transport developments and researchers
- Monash IRT supports UNESCAP initiative to Enhance cooperation among transport research, training institutes and government agencies for sustainable transport development