



Future Infrastructure Innovations for Local Government 2019

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Road Corridors
of today are set
to be
Mobility Corridors
of tomorrow

IT'S TIME FOR A "RESET"



Chapel Street, South Yarra.

- Mobility as a Service
- Connected and Automated
- Shared spaces
- Innovative vehicles
- Last mile mobility
- Safety
- Sustainability
- New Economy

RESET THE INFRASTRUCTURE

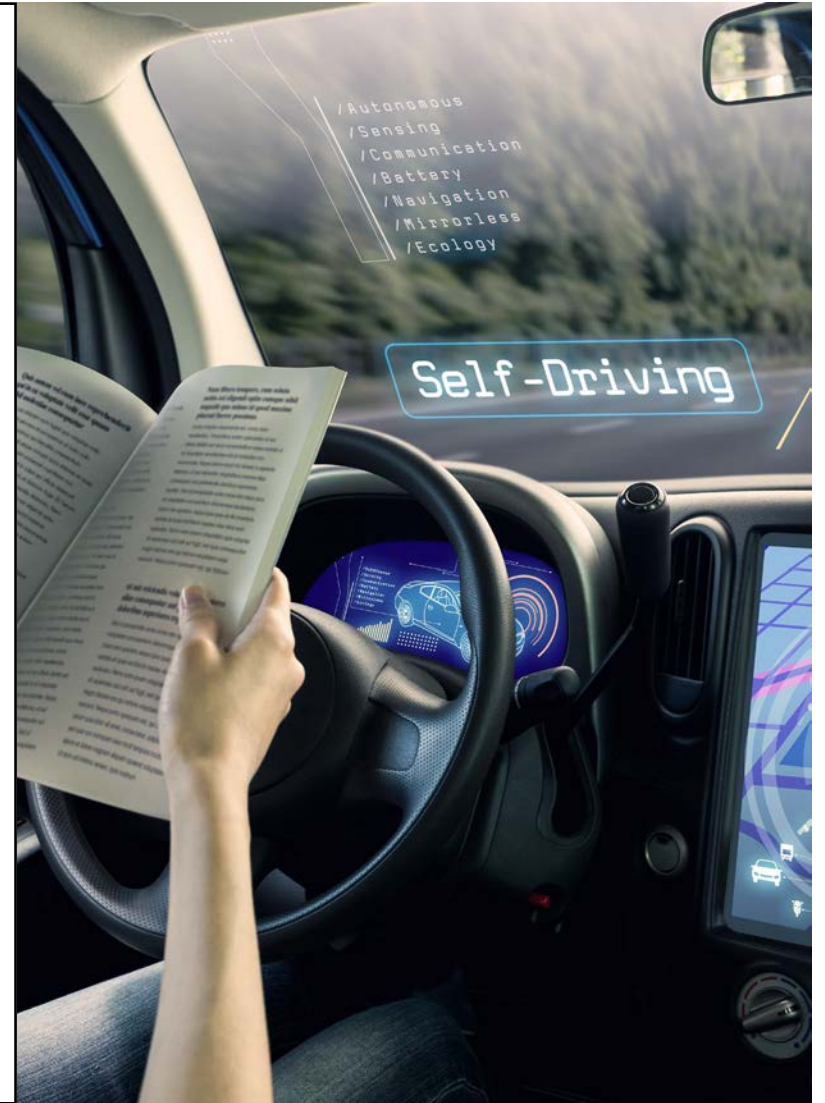


Safe roads, reliable journeys, informed travellers

Preparing the strategic road network
for electric vehicles
A research programme



PLATOONING FOR FREIGHT & PASSENGERS

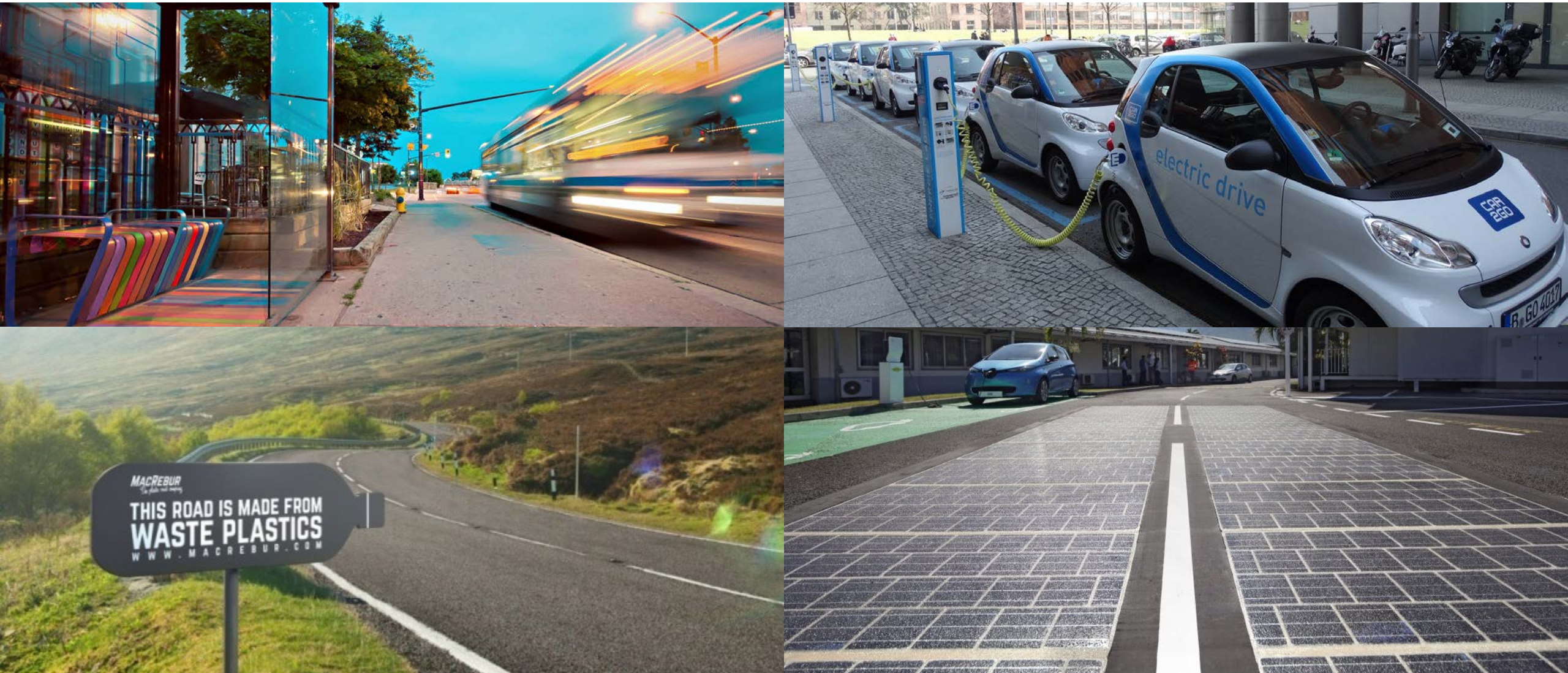


DRIVERLESS TRAINS

6



NEW MATERIALS & NEW PRODUCTS



CREDIT: <http://transenergize.com/wp-content/uploads/201704Macrebur-1>

CREDIT: <https://www.distinguished-mag.com/wp-content/uploads/2017/07/20170203-GTOI-Herv%C3%A9-DOURIS-22-R-991x470.jpg>

Why Aussies should be concerned about the country's recycling crisis

Plastics could be turned into roads as governments ban waste exports

Old tyres wheeled out for resurfacing motorways

China's ban on foreign waste leaves Australian recycling industry eyeing opportunities

'It is ultimately just asphalt': Recycled glass, plastic laid in road trial

China Has Had Enough of Your Garbage

Scott Morrison to push premiers to improve 'appalling' record on plastic recycling

Glass, asphalt plants open in Victoria

Morrison's war on waste welcomed

War on waste hits the road with truck tyres and jam jars

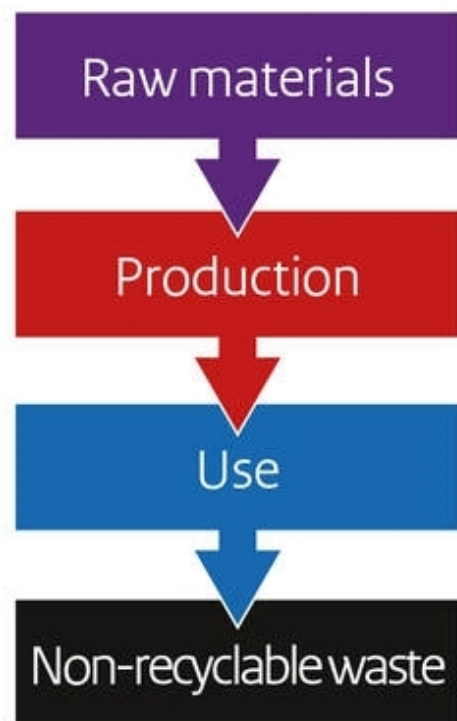
A year after China shut the door, how will Australia deal with its recycling?



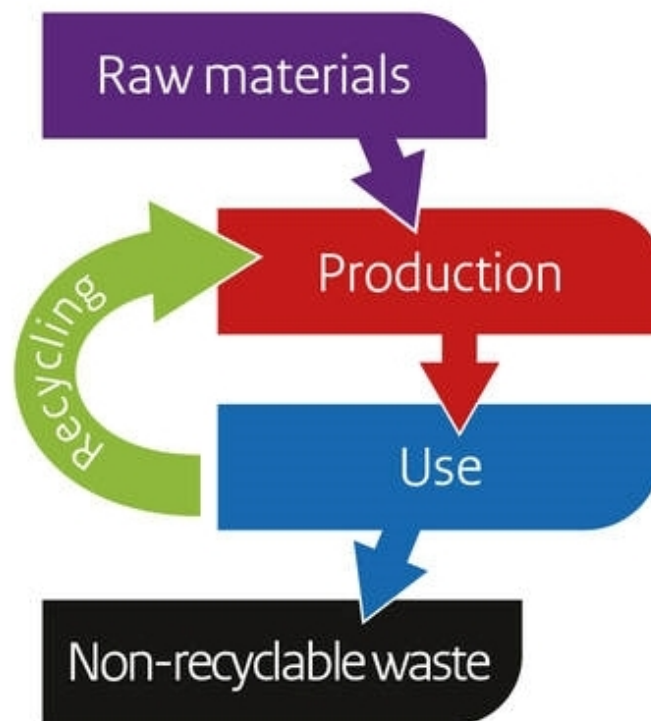
CIRCULAR VS LINEAR ECONOMY

Reduce, Reuse, Recycle

Linear economy



Reuse economy



Circular economy



Innovation in Road Materials

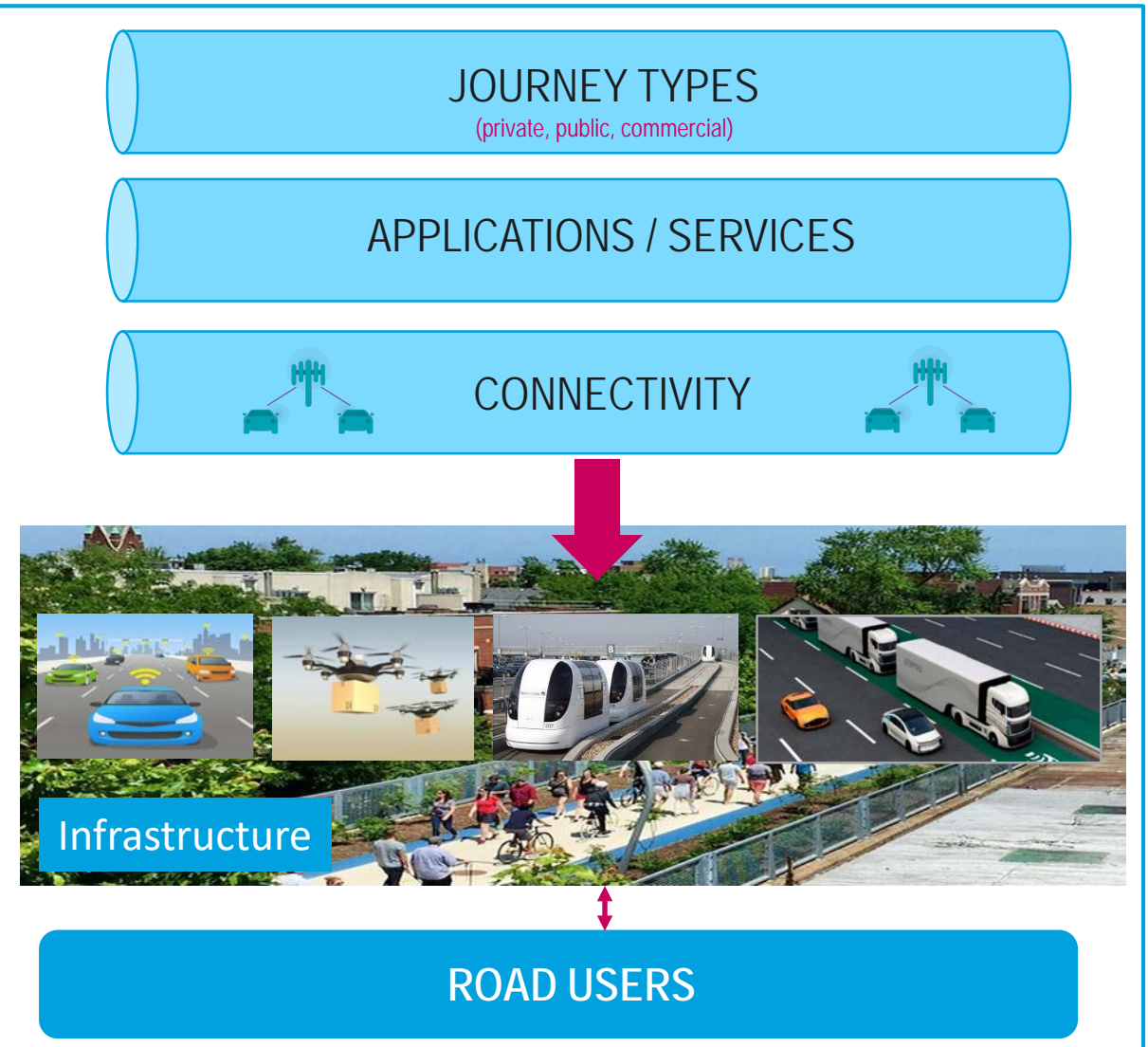
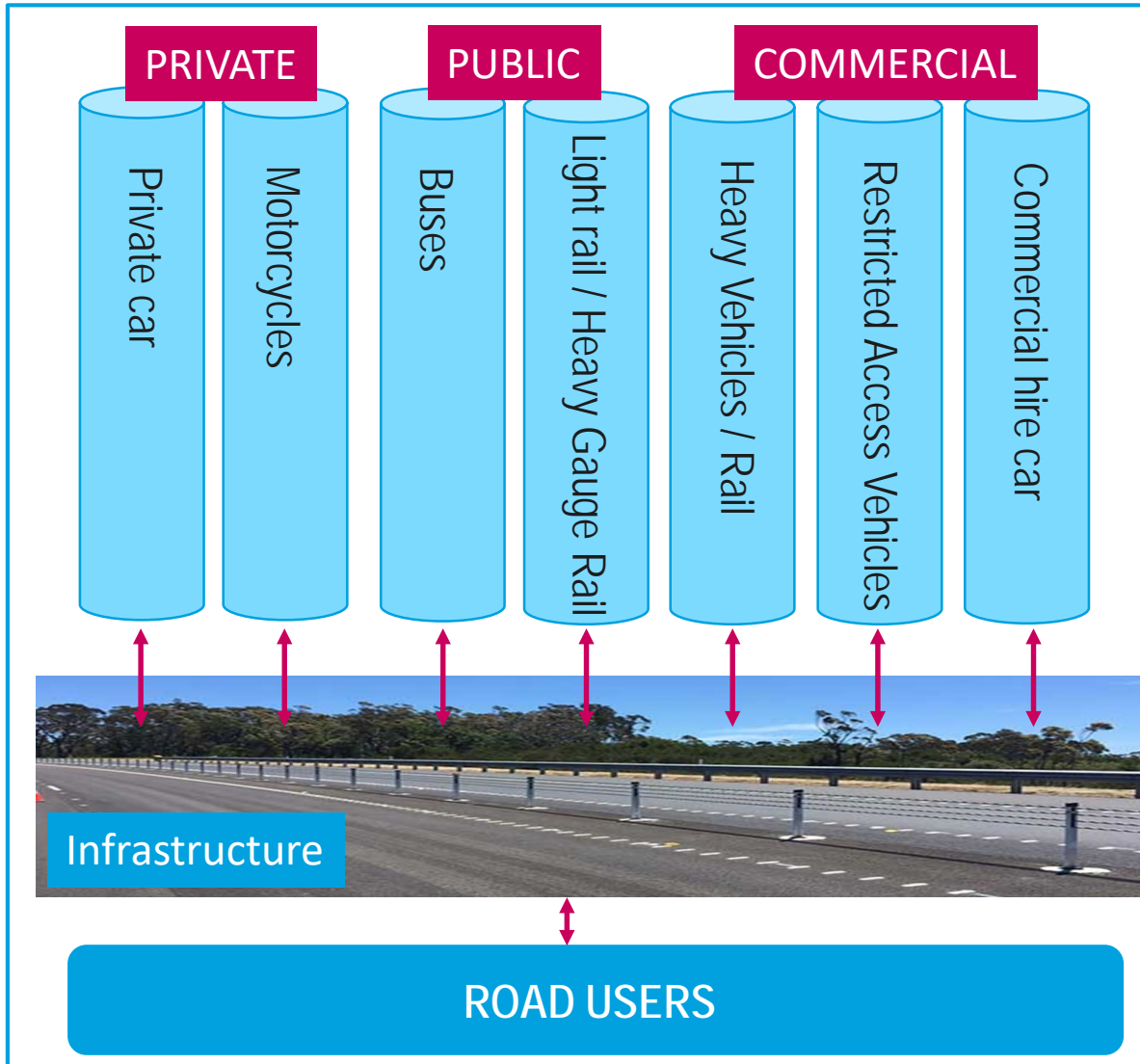
ARRB RESEARCH INTO PRACTICE

Developing Guidelines - Specifications for Use

“Guidelines and standards for the use of recycled materials in pavements are needed to offset the inherent conservative (rule following) nature of many road practitioners.”



NEXT GENERATION TRANSPORT





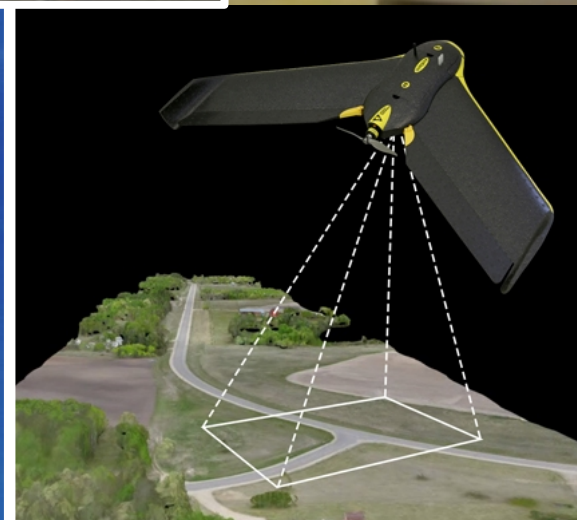
NEW JOURNEYS : NEW VEHICLES



FREIGHT TASK RE-IMAGINED



CONNECTED JOURNEYS



DRONES

ARRB ASSISTS LOCAL GOVERNMENT TO INNOVATE

FUTURE TRANSPORT INFRASTRUCTURE



Research Labs



Pavement & Materials



Specifications



Guidelines

FUTURE TRANSPORT TECHNOLOGY



Smart Traffic
Management



Network Operations
Planning



Intelligent Transport
Systems Assets



Advanced Mobility
Technologies

TRANSPORT SAFETY



Transport Safety
Policy



Transport User
Behaviour



Safe Road
Infrastructure



Safe Mobility

SUSTAINABILITY AND RESILIENCE



Resilient Transport
Systems



Sustainable Transport
Planning



Freight & Logistics

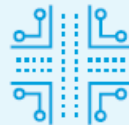


Transport Policy

NEXT GENERATION ASSET MANAGEMENT



Data Collection



Infrastructure
Performance

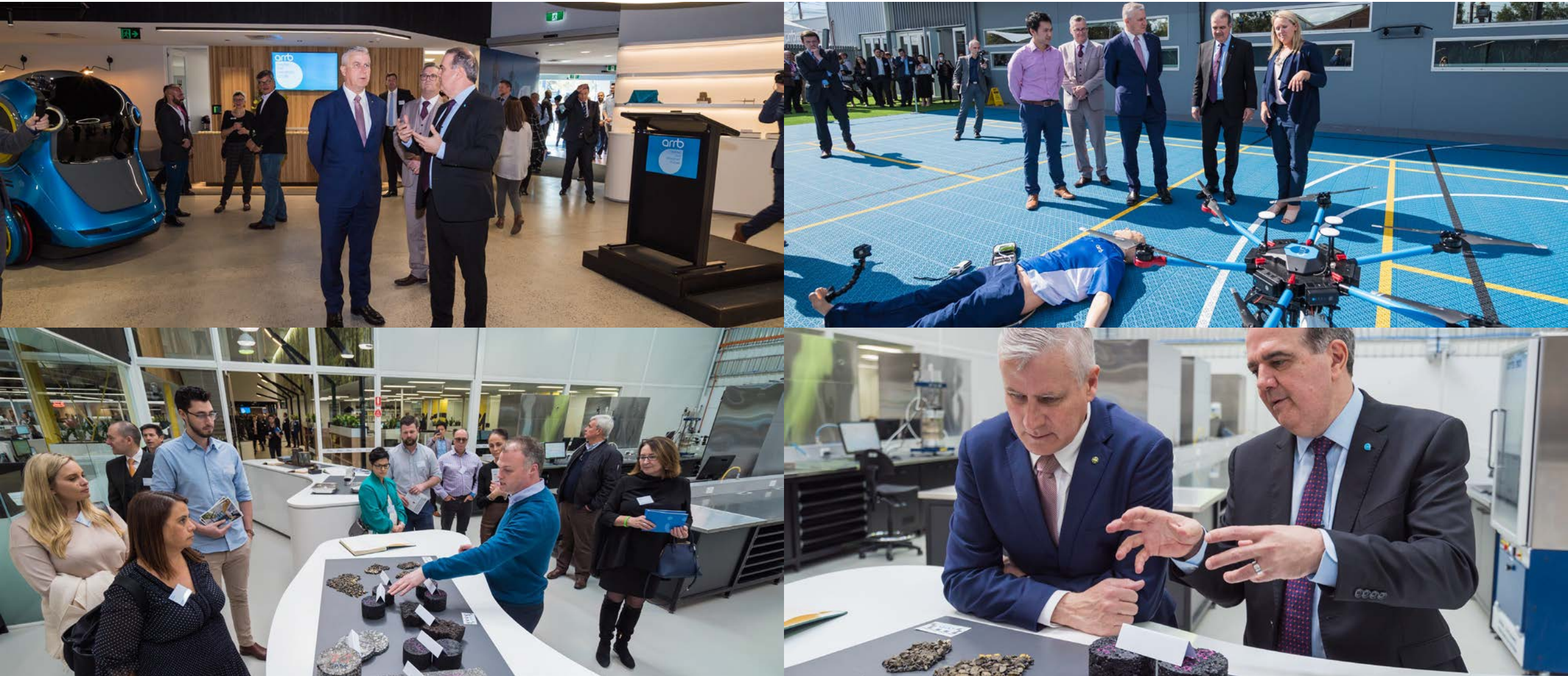


Intelligent Asset
Management



Transport economics

NEW FACILITIES TO MEET NEW CHALLENGES



REAL Safety SOLUTIONS - Predictive Risk Management Approach

18

Before
1 Star iRAP

After
3 Star iRAP



REAL Safety SOLUTIONS - Predictive Risk Management Approach

19

Before
1 Star iRAP

After
3 Star iRAP



iPAVE intelligent Pavement Assessment Vehicle

Network Level Assessment



- Allows greater understanding of pavement condition above & below surface
- Data is successfully being used to manage road networks

iPAVE Efficient Infrastructure Management Tool

21



iSSAVE - intelligent Safe Surface Assessment VEHICLE

22



+ GNSS DGPS geospatial location

+ Digital imaging system

+ Rutting

+ Texture
Centre and Both wheel
paths



+ Geometry
Cross fall, Grade,
Horizontal and Vertical
curvature



Continuous Friction Response

Are our roads CAV ready?



The vehicle

ARRB network survey vehicle
with front facing cameras

The driving task

A survey of 1000 km of priority
roads

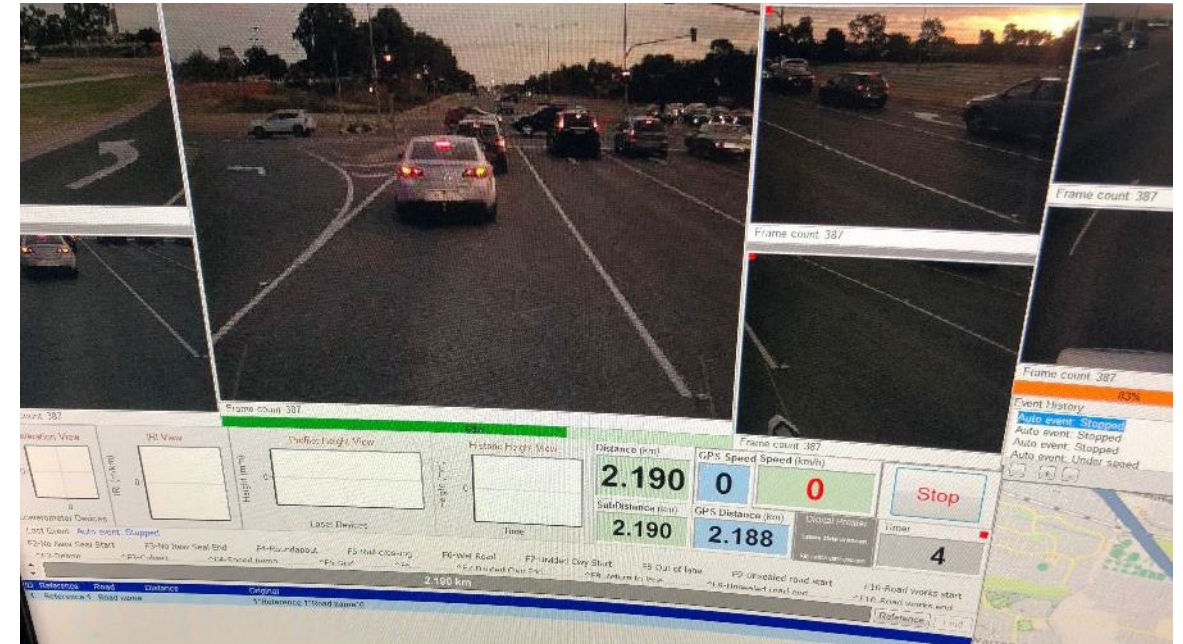


Sample of data outputs

Mobileye – data logger interface



ARRB Video imagery interface



GPS data

- Lat, long, time, distance, speed

Line markings

- **Type:** 6 variations
- **Quality:** low or high
- **Width:** 1cm resolution

Signs

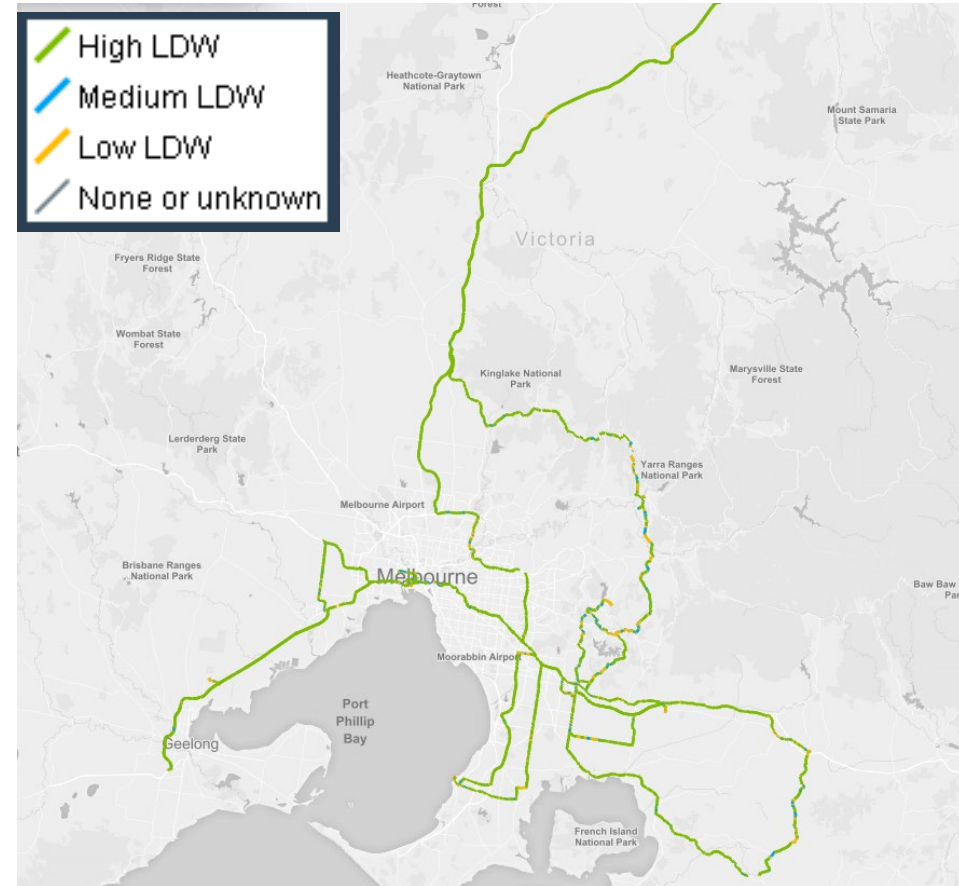
- **Type:** 73 variations
- **Position:** x, y, z

Line marking map based on real-time data

Quality



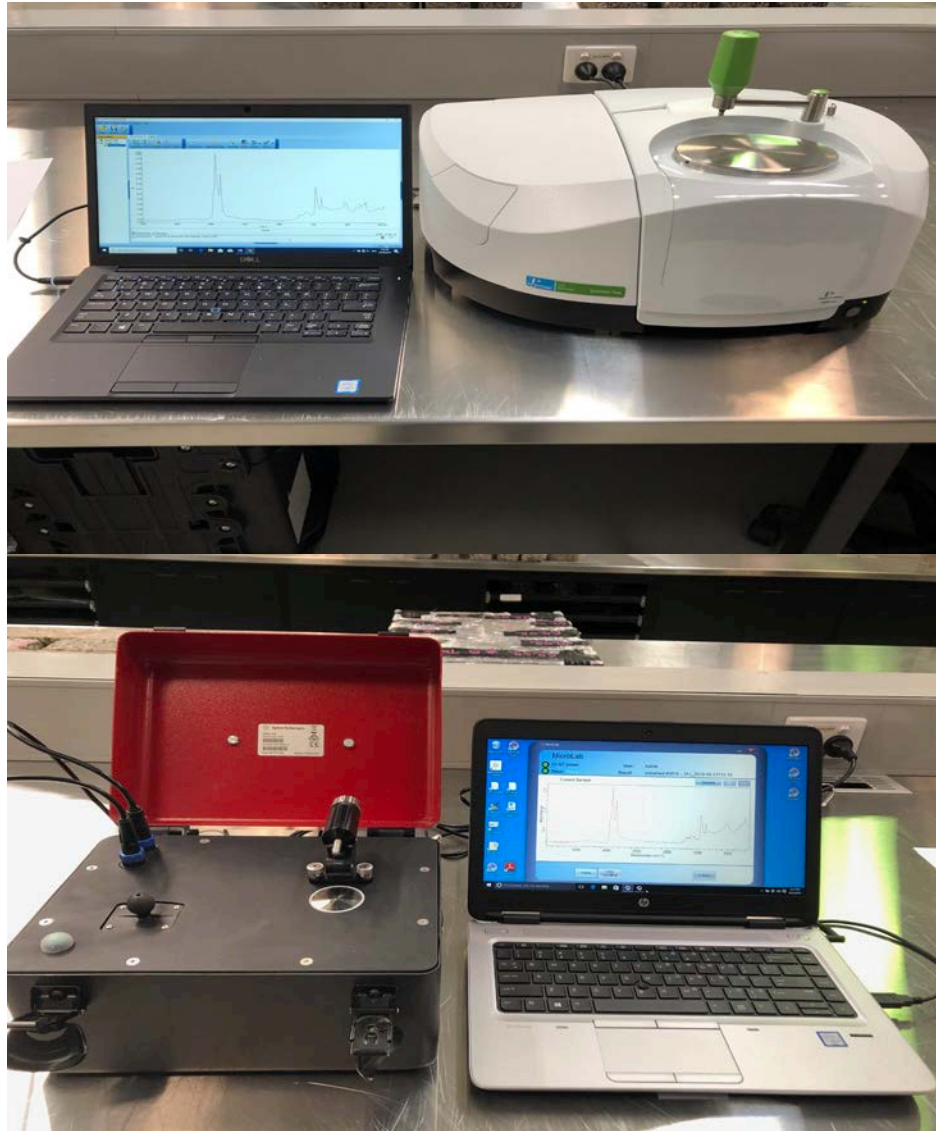
Lane Departure Warning availability





BITUMEN AGING – NEW DEVICES TO TEST INSITU CONDITIONS

WHAT IS ---- FTIR -----

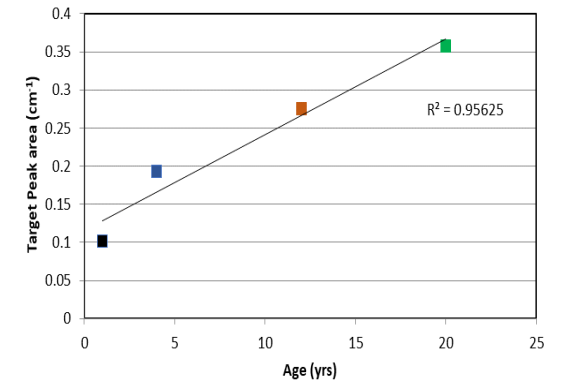
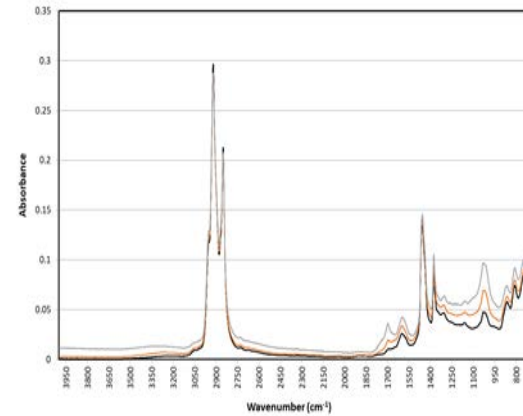
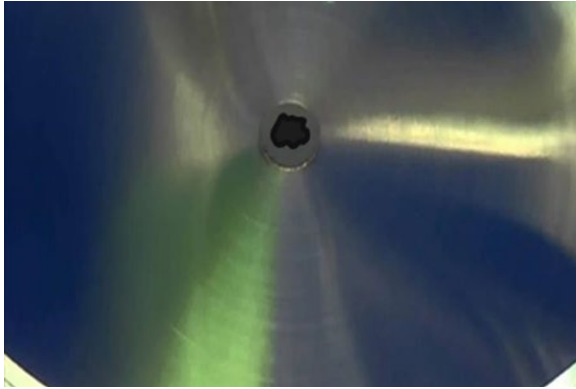


Fourier Transform Infrared Spectroscopy (FTIR) is a process where the chemical composition of a material can be determined

The FTIR spectrometer generates radiation through an infrared light source

Detecting the number and type of chemical groups present in a material is the outcome

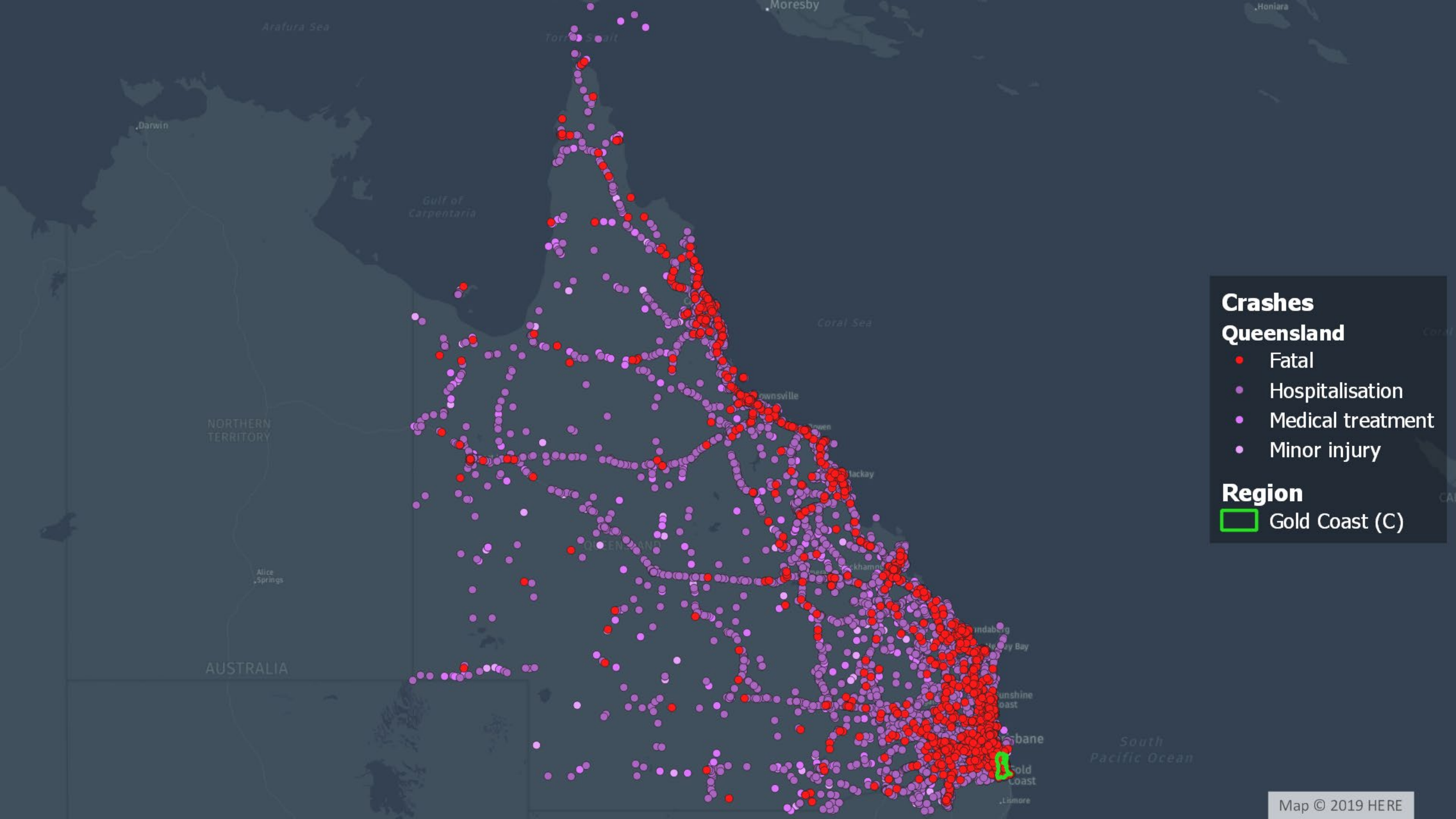
WHY IS FTIR USEFUL?



- Relatively small amounts of sample required
- Testing process is quick and easy
- The IR spectrum of various material conditions can be measured
- Reference curves can be created

ARRB National Transport Performance Centre

- Crashes**
Queensland
- Fatal
 - Hospitalisation
 - Medical treatment
 - Minor injury



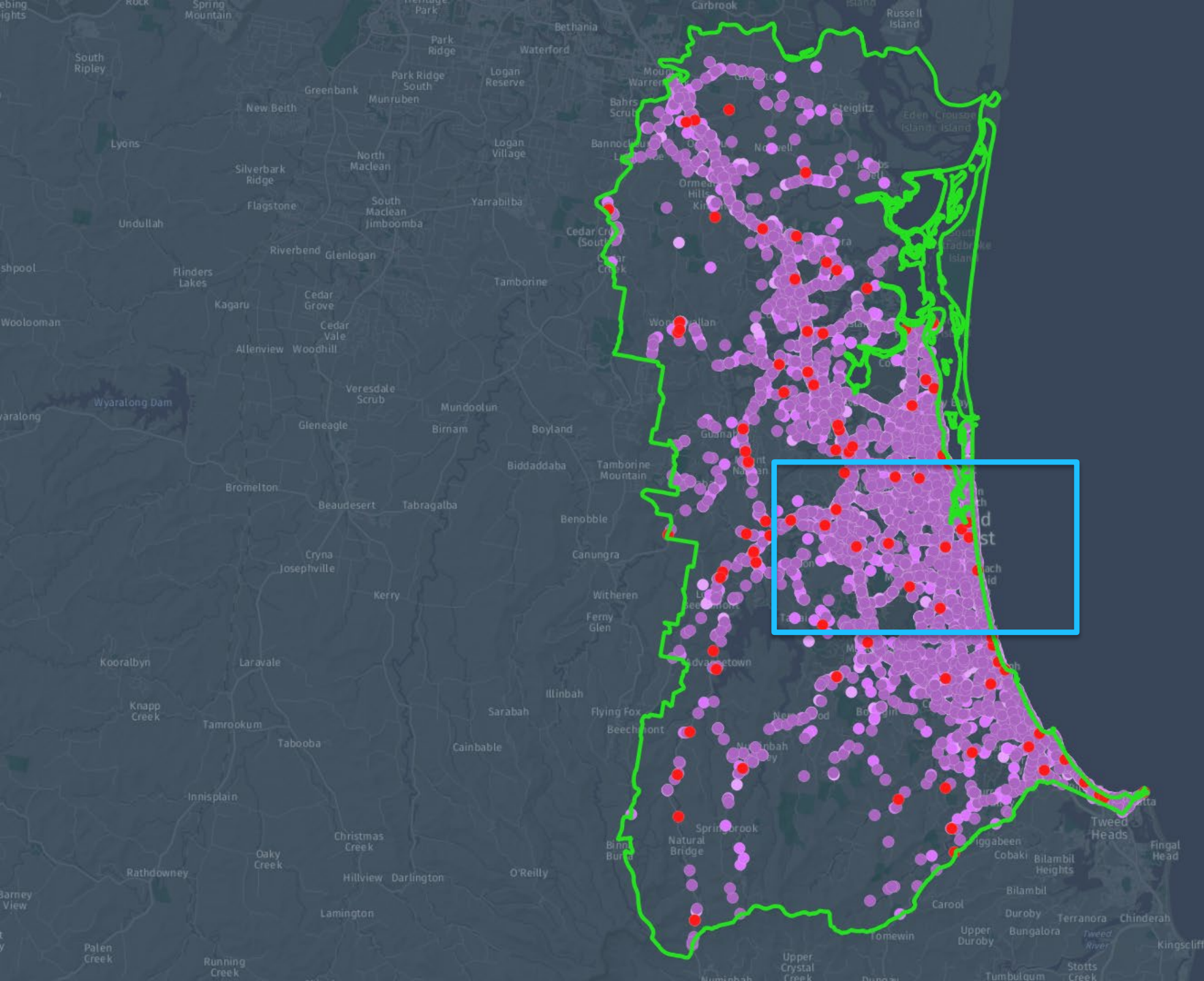
Crashes

Queensland

- Fatal
- Hospitalisation
- Medical treatment
- Minor injury

Region

- Gold Coast (C)



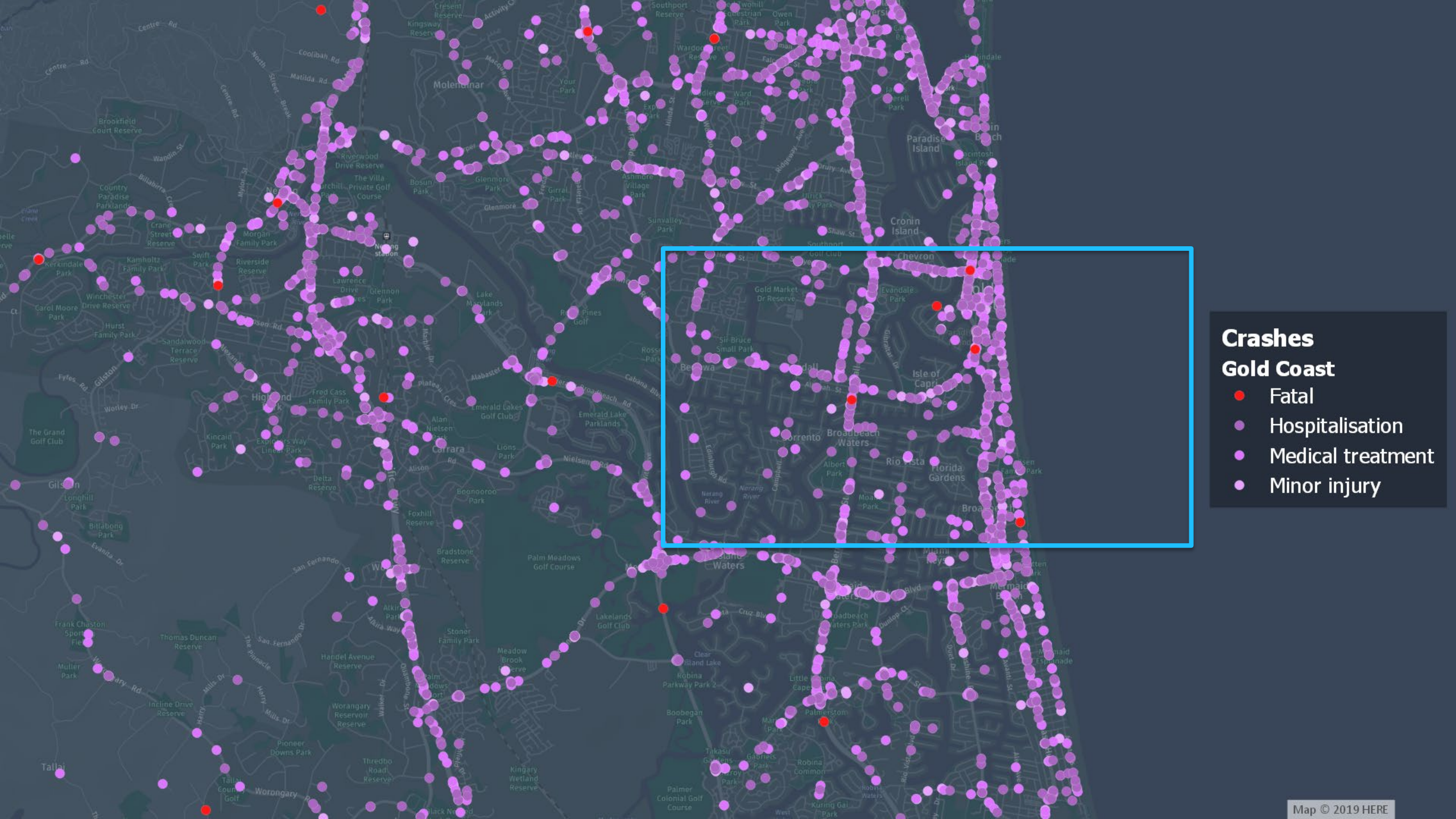
Crashes

Gold Coast

- Fatal
- Hospitalisation
- Medical treatment
- Minor injury

Region

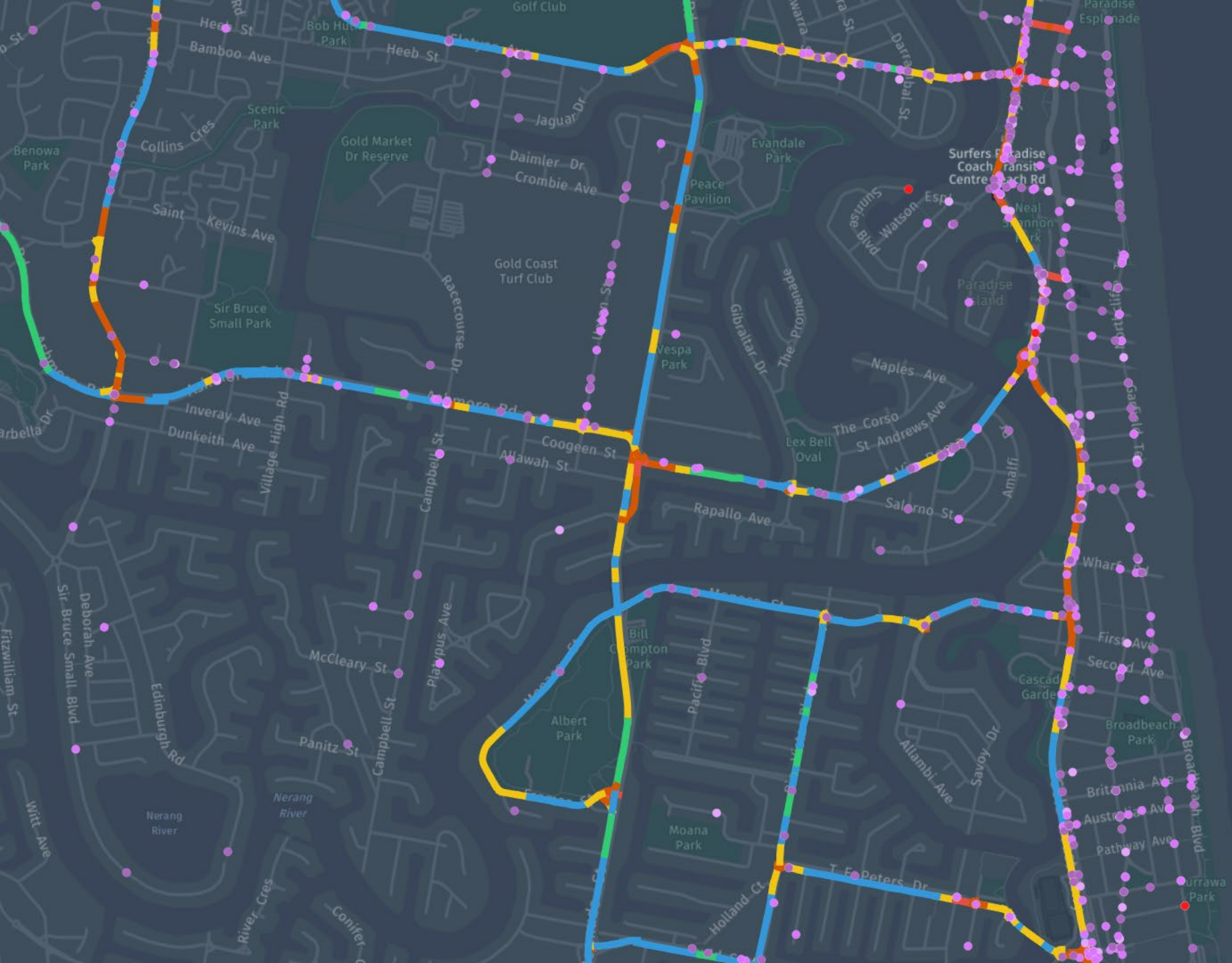
- Gold Coast (C)



Crashes

Gold Coast

- Fatal
- Hospitalisation
- Medical treatment
- Minor injury



Crashes

Gold Coast LG

- Fatal
- Hospitalisation
- Medical treatment
- Minor injury

Traffic

Speed Rel. Posted

- < 10%
- 10 - 30%
- 30 - 50%
- 50 - 70%
- > 70%



Condition

Roughness (Here IRI)

- 0 - 2.5
- 2.5 - 3.5
- 3.5 - 4.5
- 4.5 - 5.5
- > 5.5



Crashes

Gold Coast LG

- Fatal
- Hospitalisation
- Medical treatment
- Minor injury

Condition

Roughness (Here IRI)

- 0 - 2.5
- 2.5 - 3.5
- 3.5 - 4.5
- 4.5 - 5.5
- > 5.5

Road Materials Guide

Focus areas include:

- Material extraction, lab testing, stabilisation, and providing material management techniques
- Simple low-cost techniques for assessing natural and sustainable materials
- How to treat a material to minimise poor performance

Unsealed Roads Guide



2

Focus areas include:

- Best practice in material selection, construction, maintenance and geometric road design
- Resources to provide benchmark to unsealed road management as a part of the overall road asset
- Identifying failure modes, failure causes and conditions in the field

Sealed Roads Guide

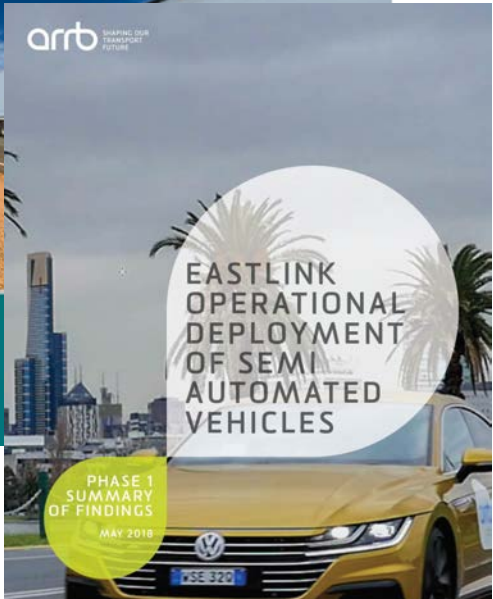
Focus areas include:

- Best practice in pavement design, construction, bituminous sealing, maintenance and rehabilitation
- Resources to provide benchmark guide to sealed road management
- Identifying failure modes, failure causes and conditions in the field
- Applying learnings in a practical field environment

Bridge Management Guide

Focus areas include:

- Establish a bridge asset management system appropriate to local government needs
- Conduct bridge inspections at various levels
- Identify common problems and solutions relating to timber, concrete, steel and masonry bridges
- Economic evaluation techniques for major repair options





Thank You

The image features a solid blue background with a pattern of small white dots. On the right side, several curved lines of dots sweep across the frame, creating a sense of motion. In the top left corner, the word "arto" is written in a white, lowercase, rounded sans-serif font. Below the logo, a large, light blue, rounded rectangular shape contains the text "SHAPING OUR TRANSPORT FUTURE" in a blue, uppercase, sans-serif font.

arto

SHAPING
OUR
TRANSPORT
FUTURE