

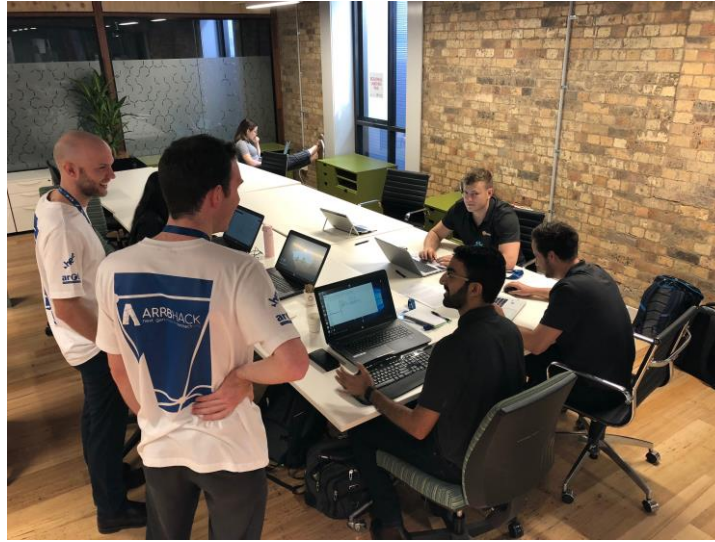


New data sources and CAV readiness audits

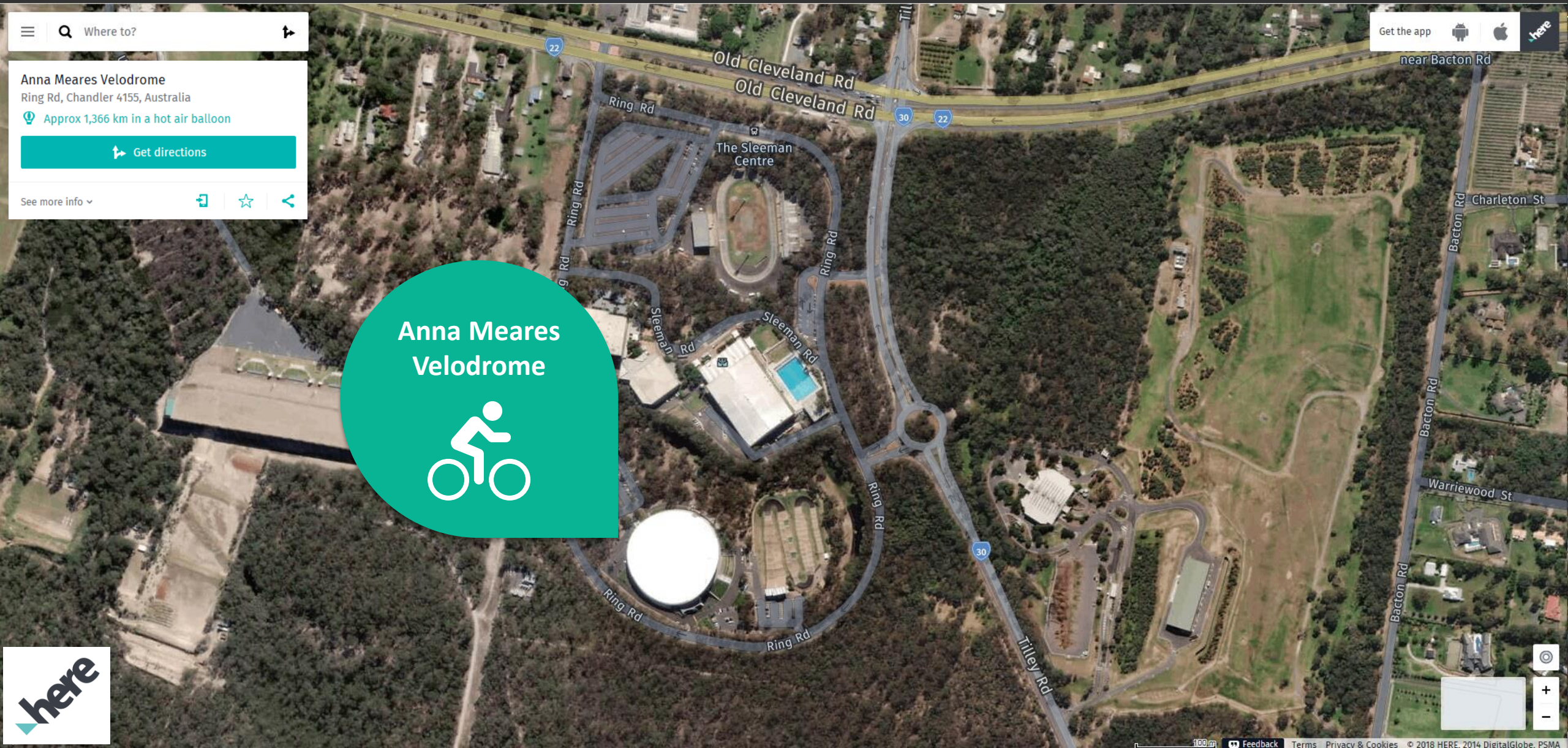
Australian Road Research Board - Anthony Germanchev 27 August 2019

Working during the rise of big data

2



Discovering new data sources



Where to?

Anna Meares Velodrome
Ring Rd, Chandler 4155, Australia
Approx 1,366 km in a hot air balloon
Get directions

See more info

Anna Meares
Velodrome



Get the app



here

near Bacton Rd

Charleston St

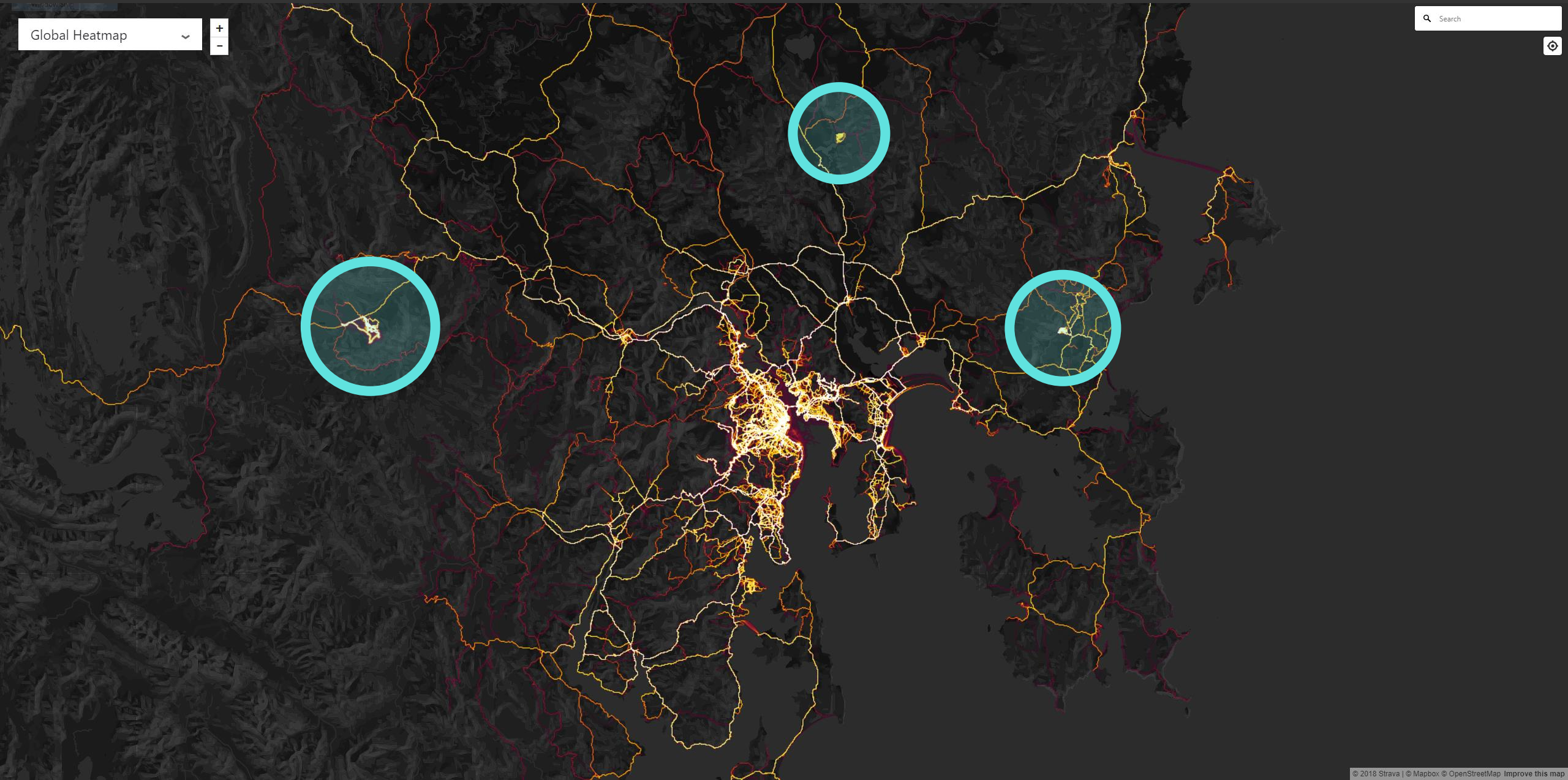
Warriewood St



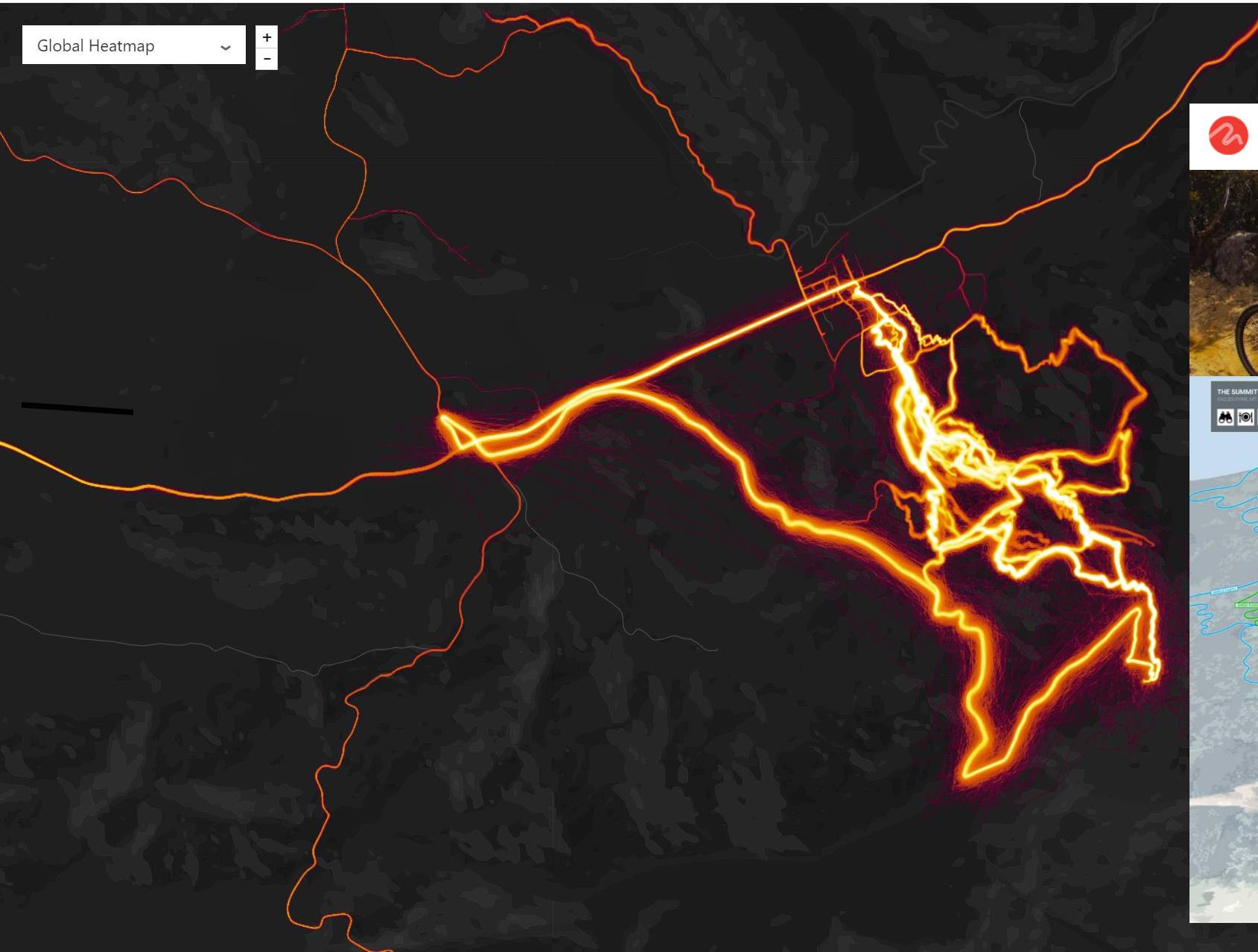
Turning the lights on in Tasmania




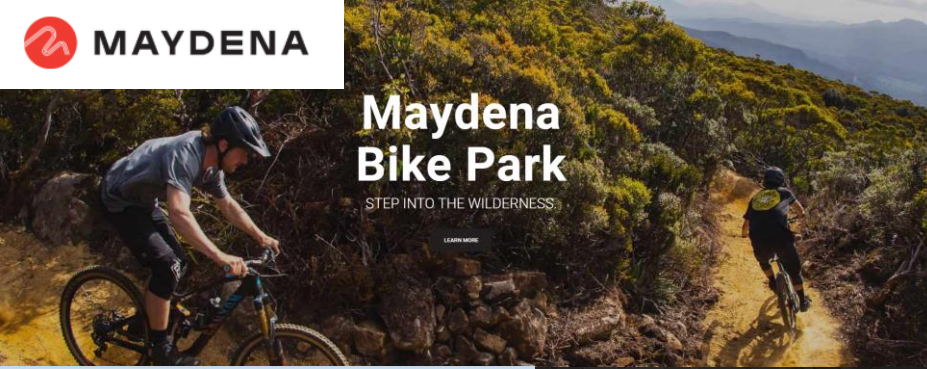
Turning the lights on in Tasmania



Turning the lights on in Tasmania



**MAYDENA**



Maydena Bike Park


STEP INTO THE WILDERNESS.

[LEARN MORE](#)

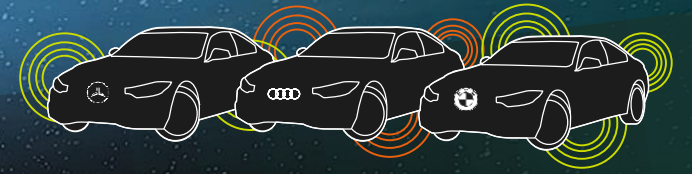
THE SUMMIT
HALLS CREEK MOUNTAIN

MID-POINT DROP-OFF

BASE BUILDING
HALLS CREEK MOUNTAIN



A new generation of data



Average
speeds

Real-Time
Traffic

Road Signs

here

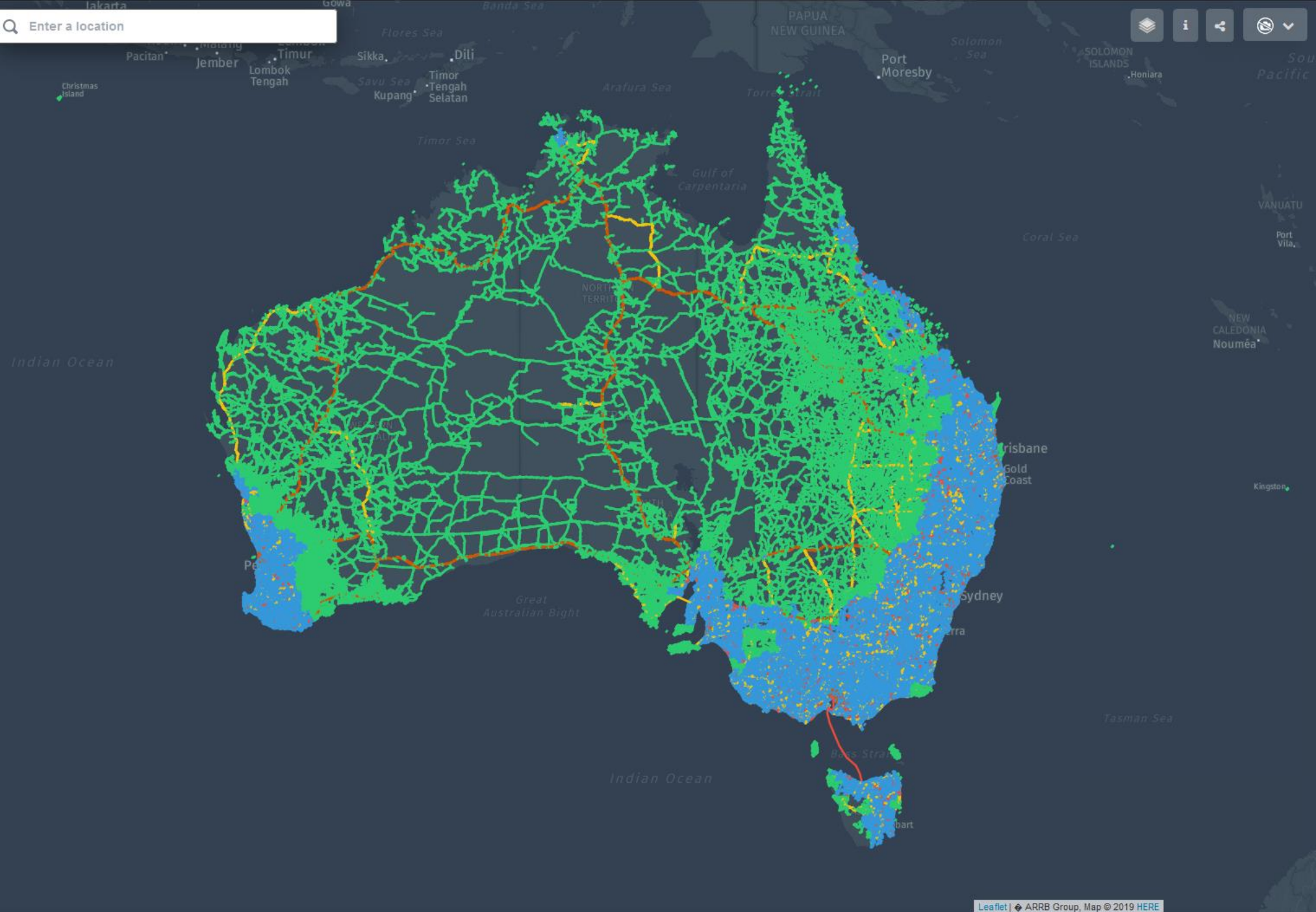


National Transport
Performance Centre

Viewing Reset

- ☐ Fatality - AUNZ >
- ☐ Road crashes - AUNZ >
- ☐ Peak traffic speeds N >
- ☐ Peak speed NPI varposted 1-4 N >
- ☐ Journey Satisfaction Index >
- ☐ IRI >
- ☒ National Traffic Volume - All Roads >
- ☐ 80% Vehicle Travel >

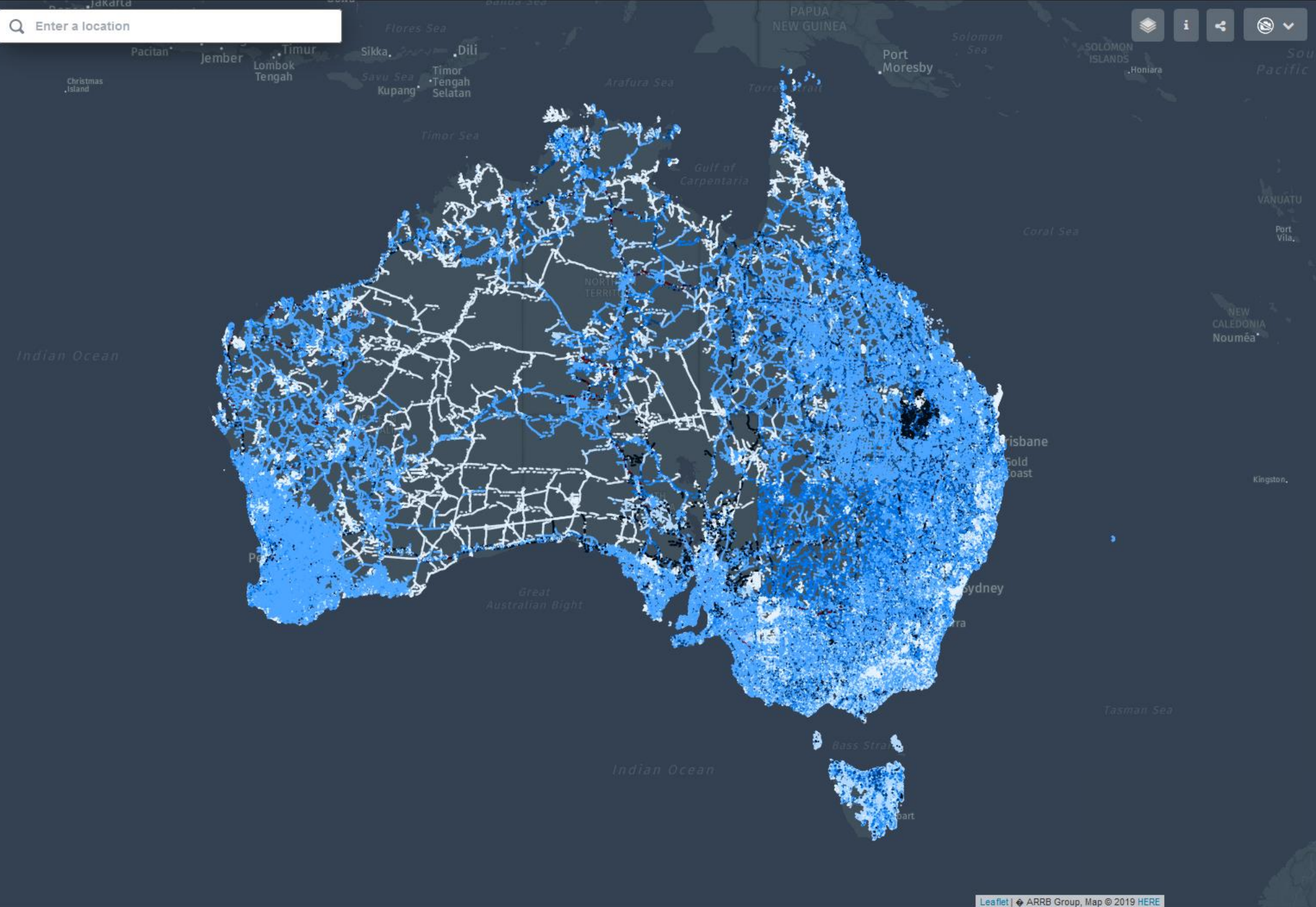
+
-



Viewing Reset

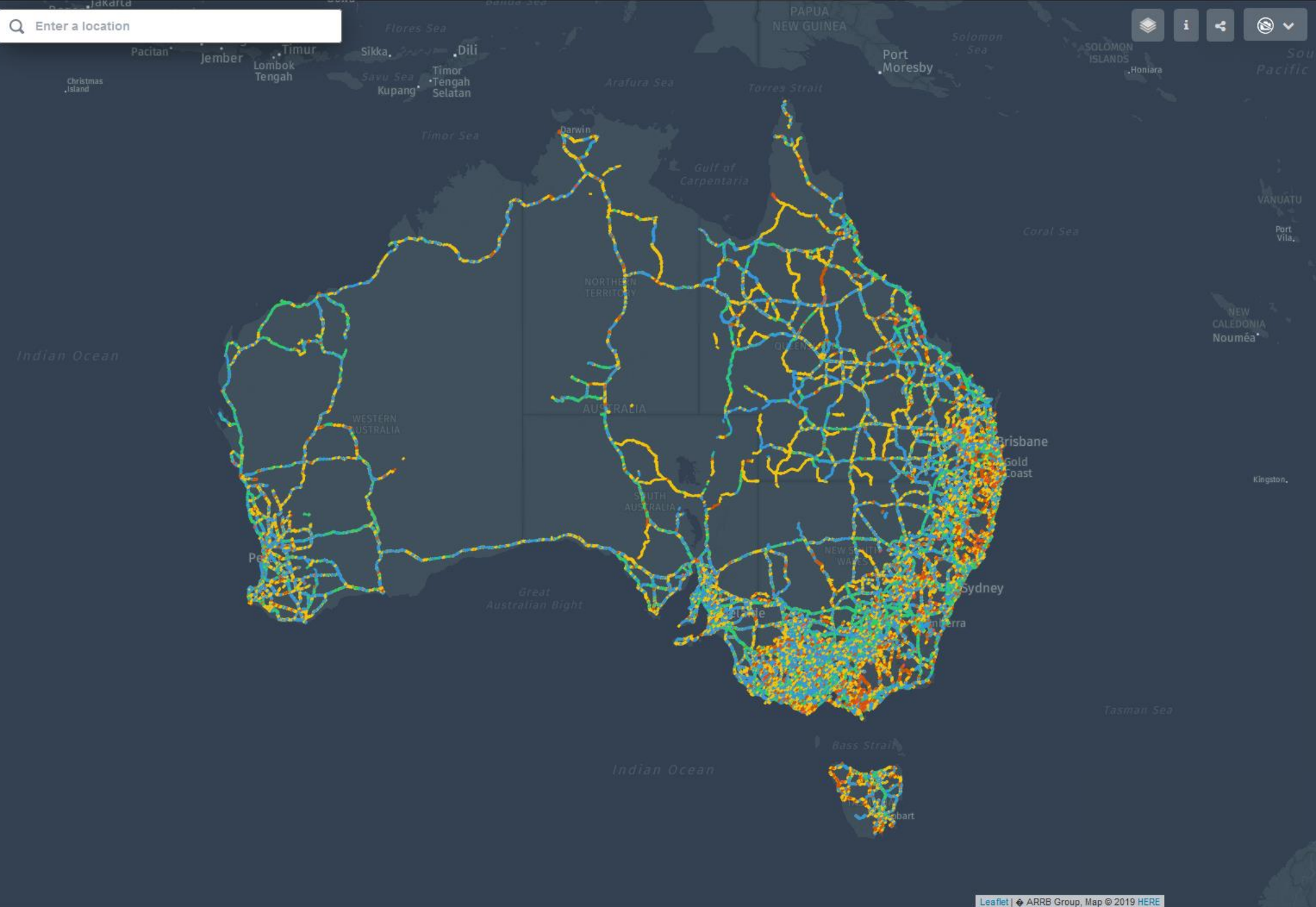
- ☐ Fatality - AUNZ
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- ☐ 80% Vehicle Travel

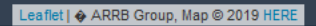
+
-



- Viewing Reset
- ☐ Fatality - AUNZ
 - ☐ Road crashes - AUNZ
 - ☐ Peak traffic speeds N
 - ☒ Peak speed NPI varposted 1-4 N
 - ☐ Journey Satisfaction Index
 - ☐ IRI
 - ☐ National Traffic Volume - All Roads
 - ☐ 80% Vehicle Travel

+
-





National Transport Performance Centre

National independent perspective

Government owned

Breadth of expertise

Depth of knowledge

Data enabled



National Transport Performance Centre

14

Monitor

Measure

Benchmark

Forecast



Road

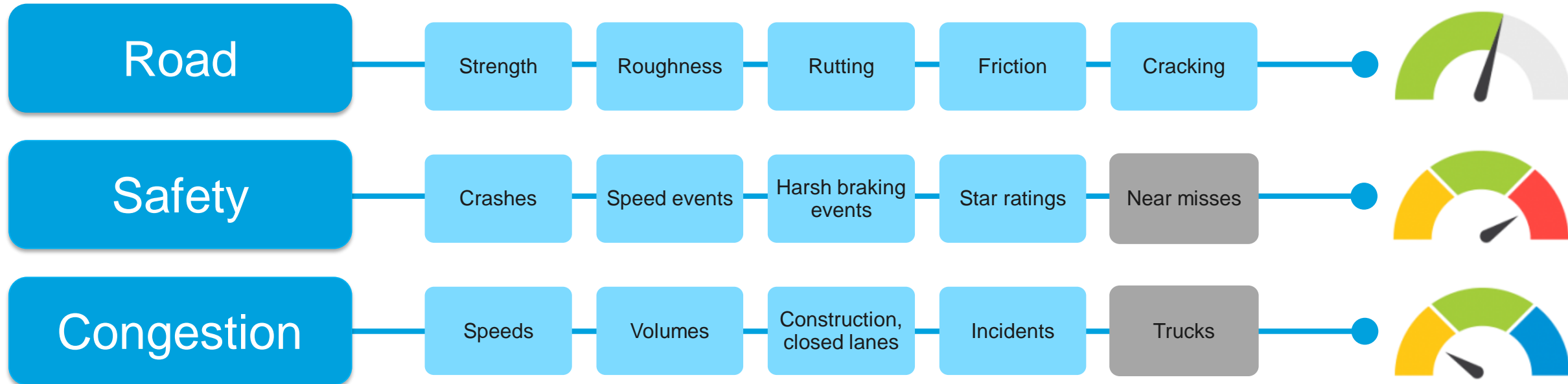


Safety



Congestion

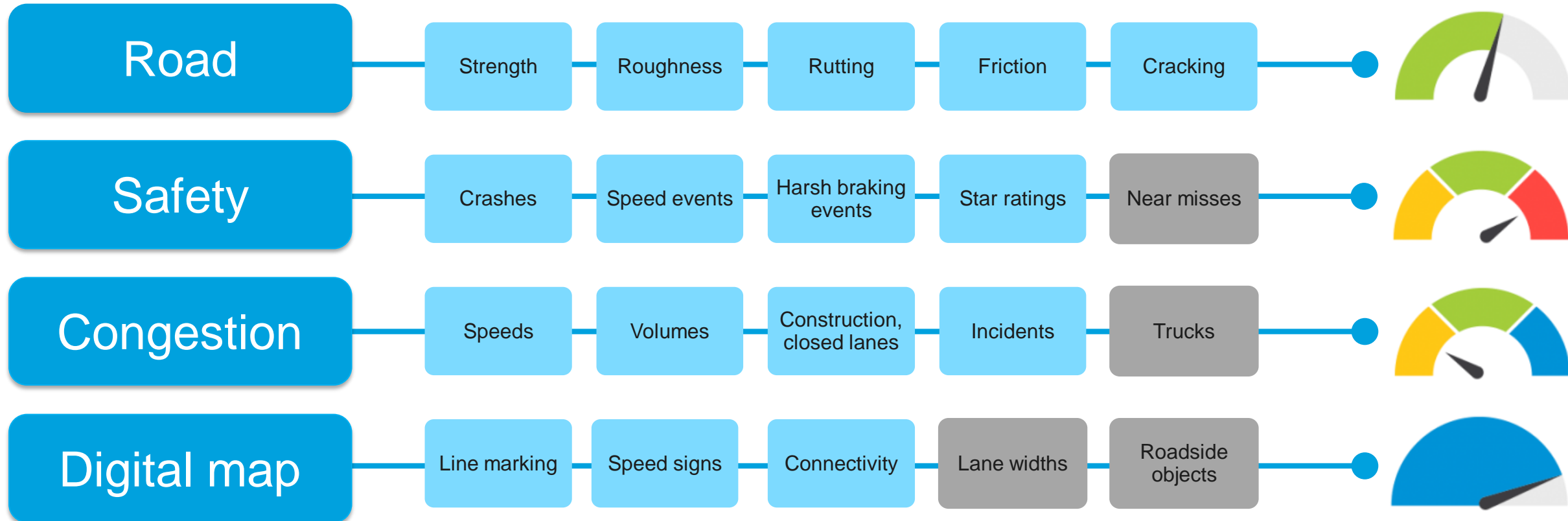
Unique datasets – adding depth of knowledge



Ready now

Roadmap

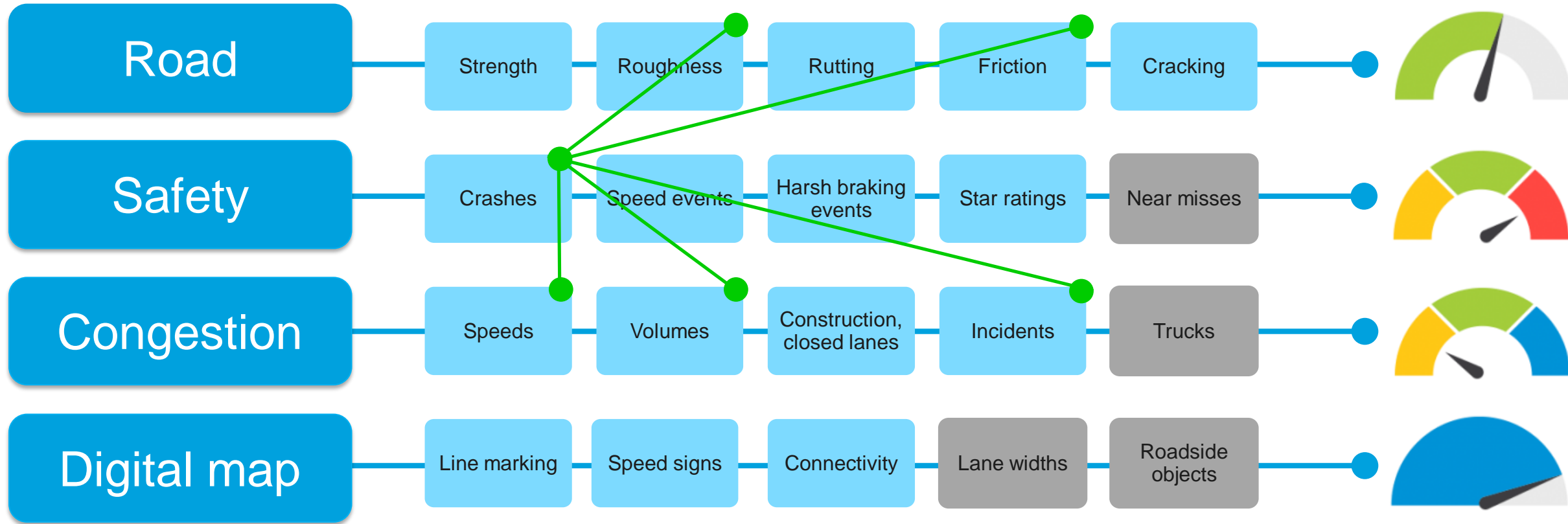
Unique datasets – adding depth of knowledge



Ready now

Roadmap

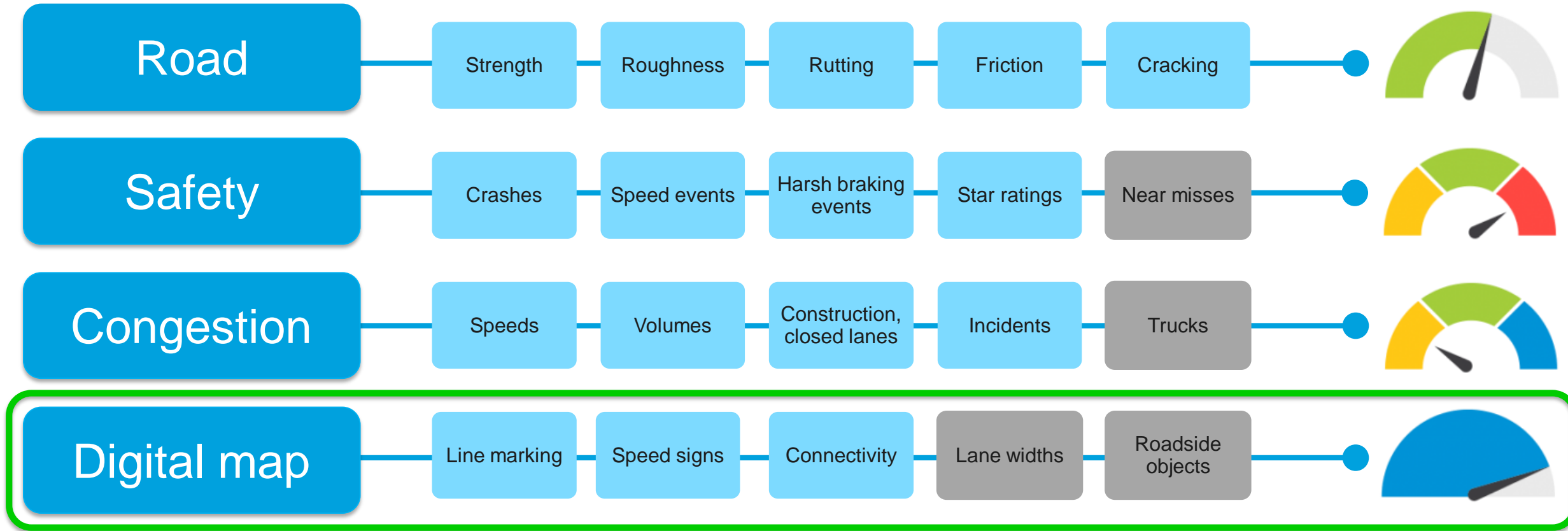
Understanding the relationships



Ready now

Roadmap

Understanding the relationships

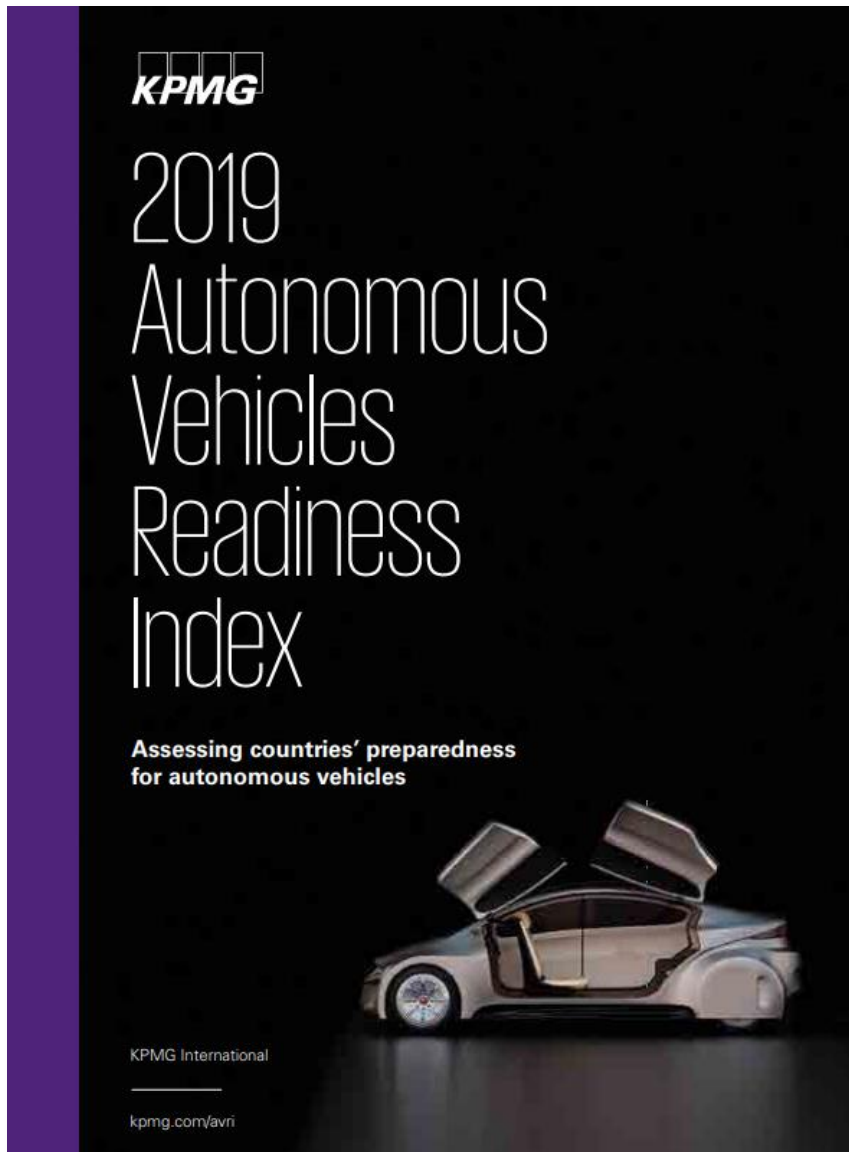


Ready now

Roadmap

Connected & Automated Vehicles (CAV) readiness road audit





Index results

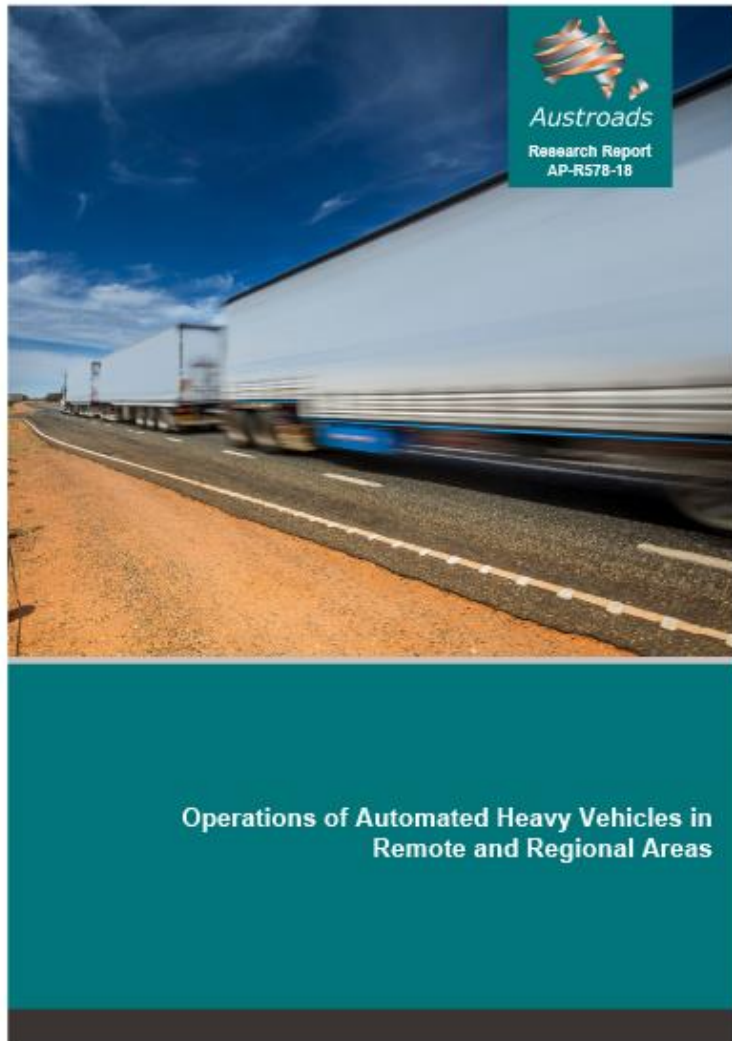
Rank		Country	2019 score
2019	2018		
1	1	The Netherlands	25.05
2	2	Singapore	24.32
3	n/a	Norway	23.75
4	3	United States	22.58
5	4	Sweden	22.48
6	n/a	Finland	22.28
7	5	United Kingdom	21.58
8	6	Germany	21.15
9	8	United Arab Emirates	20.69
10	11	Japan	20.53
11	9	New Zealand	19.87
12	7	Canada	19.80
13	10	South Korea	19.79
14	n/a	Israel	19.68
15	14	Australia	19.01
16	12	Austria	18.85
17	13	France	18.46
18	15	Spain	15.50
19	n/a	Czech Republic	14.46
20	16	China	14.41
21	n/a	Hungary	11.99
22	18	Russia	8.55
23	19	Mexico	7.73
24	20	India	6.87
25	17	Brazil	6.41

AUSTRALIA ↓

2018: 14th
2019: 15th

Preceding research

Operations of Automated Heavy Vehicles in Remote and Regional Areas



Scope

- Physical infrastructure and impact
- Technology and digital requirements

Aim

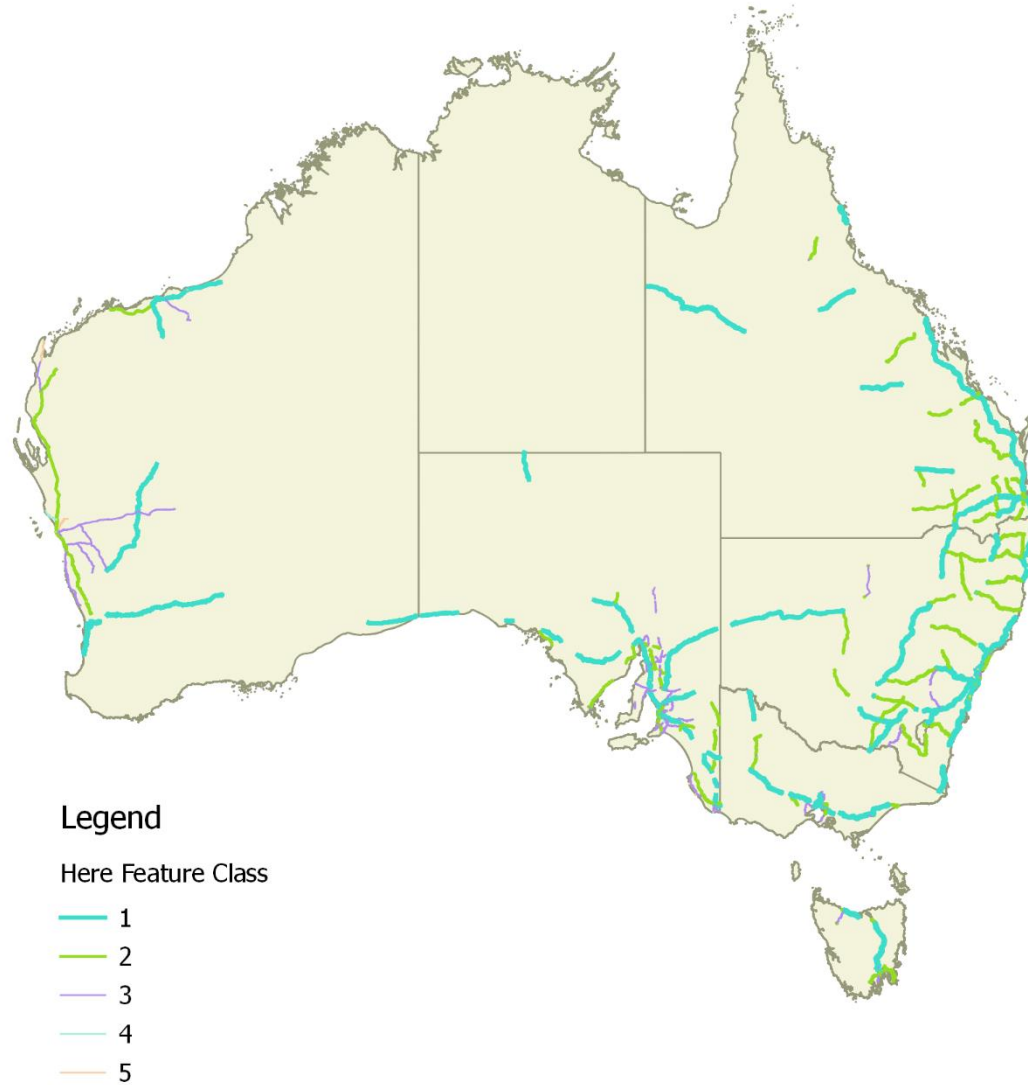
- Provide road managers with direction for future AHV deployment
- Preparing assets for AHV readiness

Australia AHV roadmap

Research findings

Timeline	Policy	Infrastructure	Technology
Short-term (preparation)	<ul style="list-style-type: none"> • Road rules • ODD / access • Accreditation / safety assurance • Complementary aspects (DSM, other telematics) 	<ul style="list-style-type: none"> • Line markings • Digital infrastructure (maps, cellular) • Impact on structures 	<ul style="list-style-type: none"> • Collaborate with OEM. • Technology requirements • “White layer” for interoperability and management • Incentivise uptake appropriately
Medium-term (implementation & further refinement)	<ul style="list-style-type: none"> • Complementary equipment regulation (e.g. DSM) applied carefully to specific levels and use cases • Interoperability-related policy • CAV commercialisation regulatory options 	<ul style="list-style-type: none"> • Line marking upgrade • Digital infrastructure deployment • HD maps provision • Establish control centre (if applicable) 	<ul style="list-style-type: none"> • Disallow white layer around road (owned by govt) to allow interoperability based on feedback from industry
Long-term (commercialisation)	<ul style="list-style-type: none"> • Refine any other specific operational regulations • Implement CAV commercialisation regulations 	<ul style="list-style-type: none"> • White layer (for interoperability) set up 	<ul style="list-style-type: none"> • Collaborate with OEMs to encourage uptake of CAV

Audit coverage



Total survey km: 25,000 km
Map links (lines): 90,000
Lines assessed: 8.4 million
Signs assessed: 8,500



Data collection vehicles



The vehicle

ARRB network survey vehicle
with front facing cameras

The driving task

A survey of 1000 km of priority
roads



Hardware and software

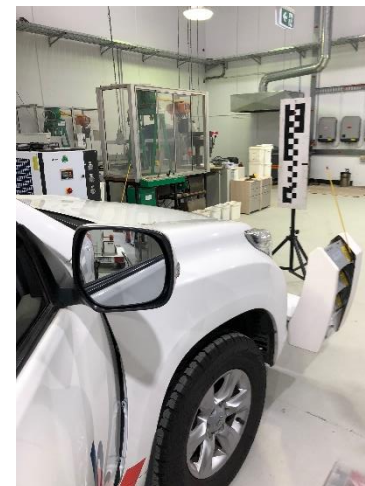
Installing the hardware and configuring the software



ARRB workshop



Testing and calibration



Test drive

Driving our roads

Collecting a sample of the road network



Data collection

- Driving the machine vision equipped Network Survey Vehicle

Sample of data outputs



GPS data

Lat, long, time, distance, speed

Line markings

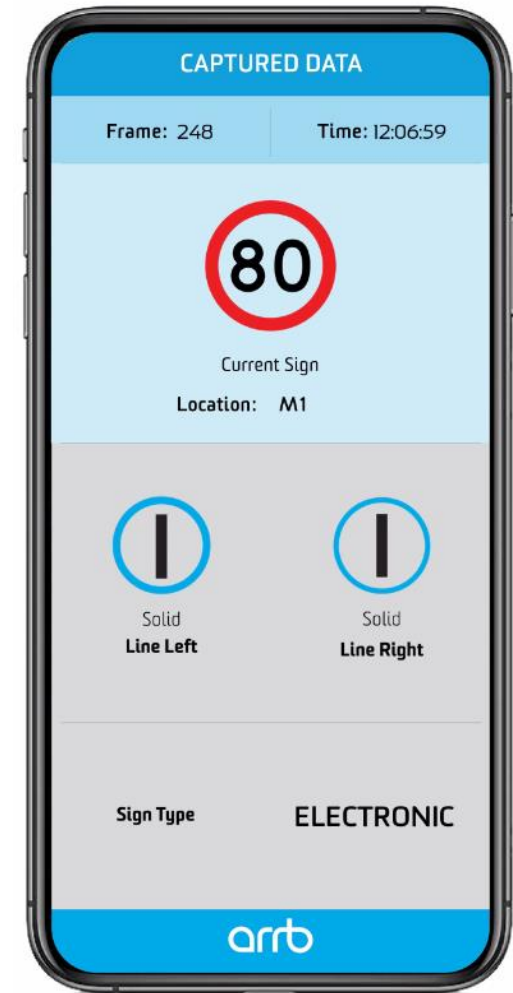
- **Type:** 6 variations
- **Quality:** low or high
- **Width:** 1cm resolution

Signs

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



Optional video outputs



CAV readiness audit

Machine vision with real-time processing



FORGING
the FUTURE
TODAY

WWW.IDVS4.COM.AU
ANZ STADIUM SYDNEY
OLYMPIC PARK

4th International Driverless
Vehicle Summit

27 – 29
OCT 2019



Australia &
New Zealand
Driverless Vehicle
Initiative



Transport
for NSW

navya
be fluid

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, 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