

National Bulk Tanker's Association

Dangerous Goods Movement Study and other telematics developments

Transport Certification Australia

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May

A decorative background graphic consisting of a network of interconnected nodes and lines. The nodes are represented by circles of varying sizes and colors, including shades of blue, green, and light blue. Some nodes are highlighted with dashed circles. The lines connecting the nodes form a complex web-like structure, suggesting a network or data flow.

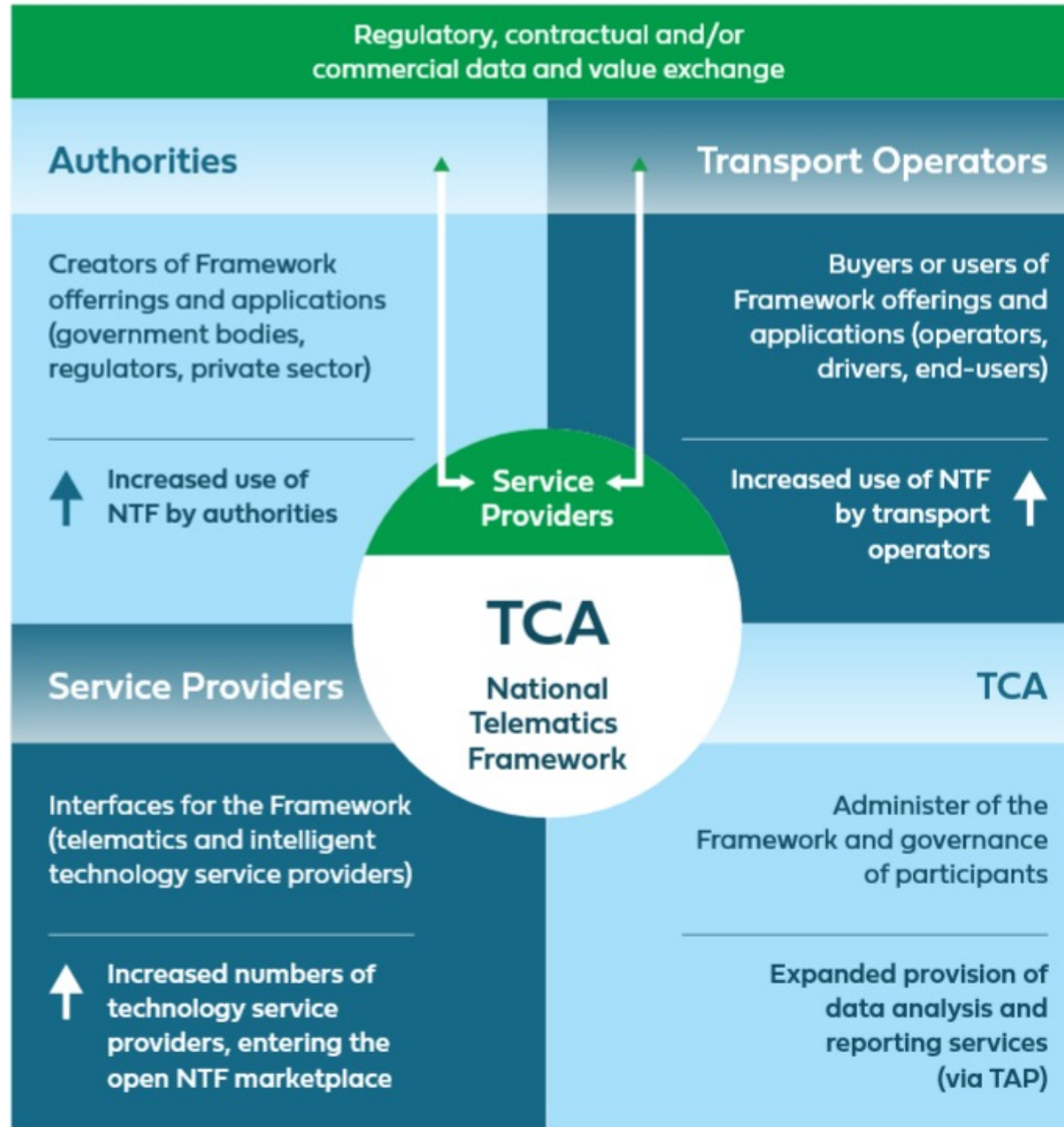
National Telematics Framework Ecosystem



TCA

and the

National Telematics Framework ecosystem



Supporting public good outcomes with data analysis



TCA has long worked with Government and industry to support public good outcomes using data analytics

Recent shift to more 'self service' access for road managers to de-identified and aggregated data analytics

Using new applications such as RIM to support research and insights for public policy, planning and road management:

- Dangerous Goods Movement Study

Data and privacy protection

- Voluntary participation and use of de-identified and aggregated data, through TCA as a trusted, third party entity - Privacy by design.
- TCA is a safe harbour, with rigorous data and privacy protection protocols.
- ‘Raw’ data about vehicle movements, operator names etc. are stored in TCA’s secure data store and not provided to external parties.
- Data is aggregated at journey level, by road name within each LGA, and data reported in ‘bundles’ no more granular than 1-20 journeys.
- TfNSW has provided assurances that identifiable data will not be sought from this study.

For example, Sydney Harbour surrounds

Dangerous Goods movements for New South Wales

Journey Count heatmap by Road Segment

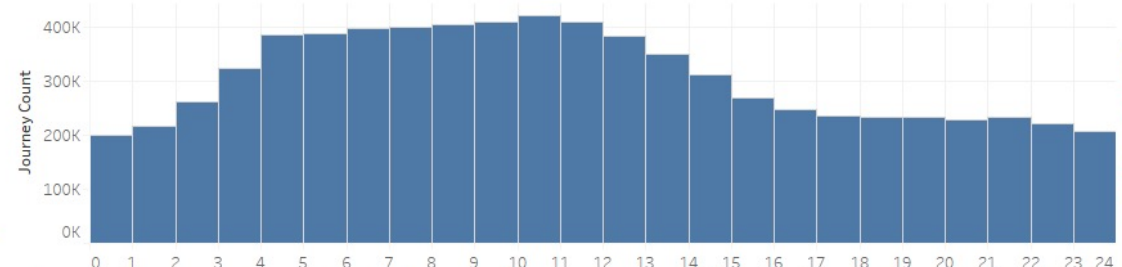


LGA Name
 (Multiple values)
 Year
 (All)
 2018
 2019
 Month
 (All)
 Journey Count
 (All)
 1 - 100
 101 - 500
 501 - 1000
 1001 - 5000
 5001 - 10000
 10001 - 50000
 50001 - 100000
 100000+
 Dangerous Goods Class
 (All)
 Chemicals
 Chemicals and Petr...
 Gas
 Petroleum and Gas

Journey Count by Month



Journey Count by Hour of Day



Colour Legend
 1 - 100
 101 - 500
 501 - 1000
 1001 - 5000
 5001 - 10000
 10001 - 50000
 50001 - 100000
 100000+

Disclaimer: The analysis provided is representative of vehicles provided to TCA for this project and as such may not be representative of all vehicles using these roads. This report was developed by TCA at the request of Transport for New South Wales using telematics data provided by participating and consenting transport operators. It contains aggregated and de-identified information. TCA has not disclosed information which identifies any vehicle to any party. Data was collected between 1 January 2018 and 31 December 2019. Journey counts are aggregated by road name within each local government area.

Some key findings

Key hubs outside of Sydney include:

- Newcastle
- Wollongong
- Cessnock
- Lithgow
- Orange
- Yass
- Wagga Wagga

Key Hubs in Sydney Metro area, LGAs:

- Port Botany
- Liverpool
- Campbelltown
- Sutherland
- Blacktown
- Parramatta

- 152 vehicles, 9 cos.
- 449,000 hours of vehicle movements
- On average 2,957 hours per vehicle

Clear consent arrangements are critical to the success of such studies.

Operators are willing to share data, when privacy is protected (aggregated and de-identified).

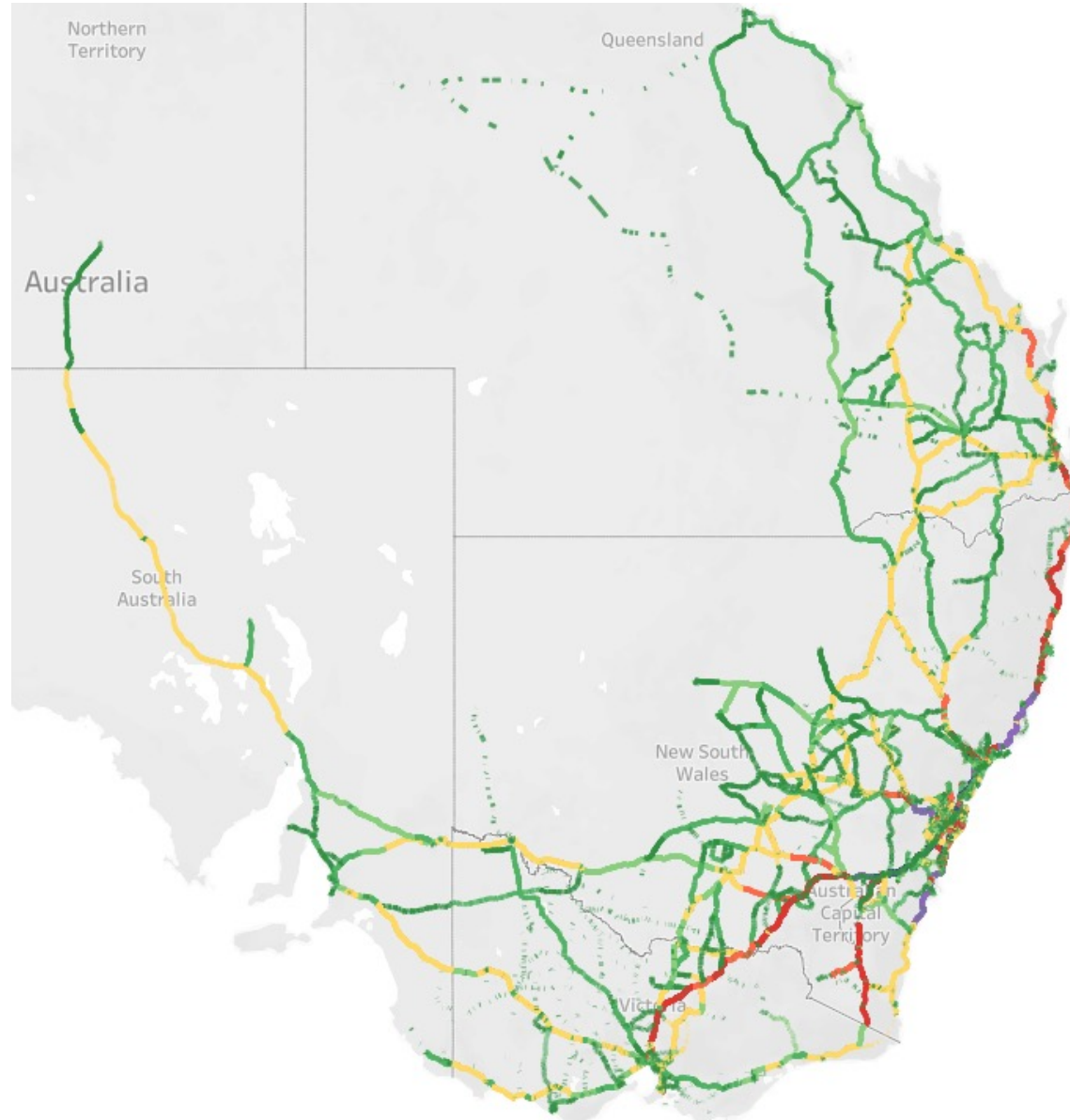
Policy and planning can benefit from shared data analysis.

DG vehicles travel all over Australia



Dangerous Goods vehicles primarily based in NSW travel all over Australia.

Australia's DG movement task is complex, interconnected and widely distributed.



National operators work out of depots across Australia.

Colour Legend

- 1 - 100
- 101 - 500
- 501 - 1000
- 1001 - 5000
- 5001 - 10000
- 10001 - 50000
- 50001 - 100000
- 100000+

Regional NSW sees many DG journeys

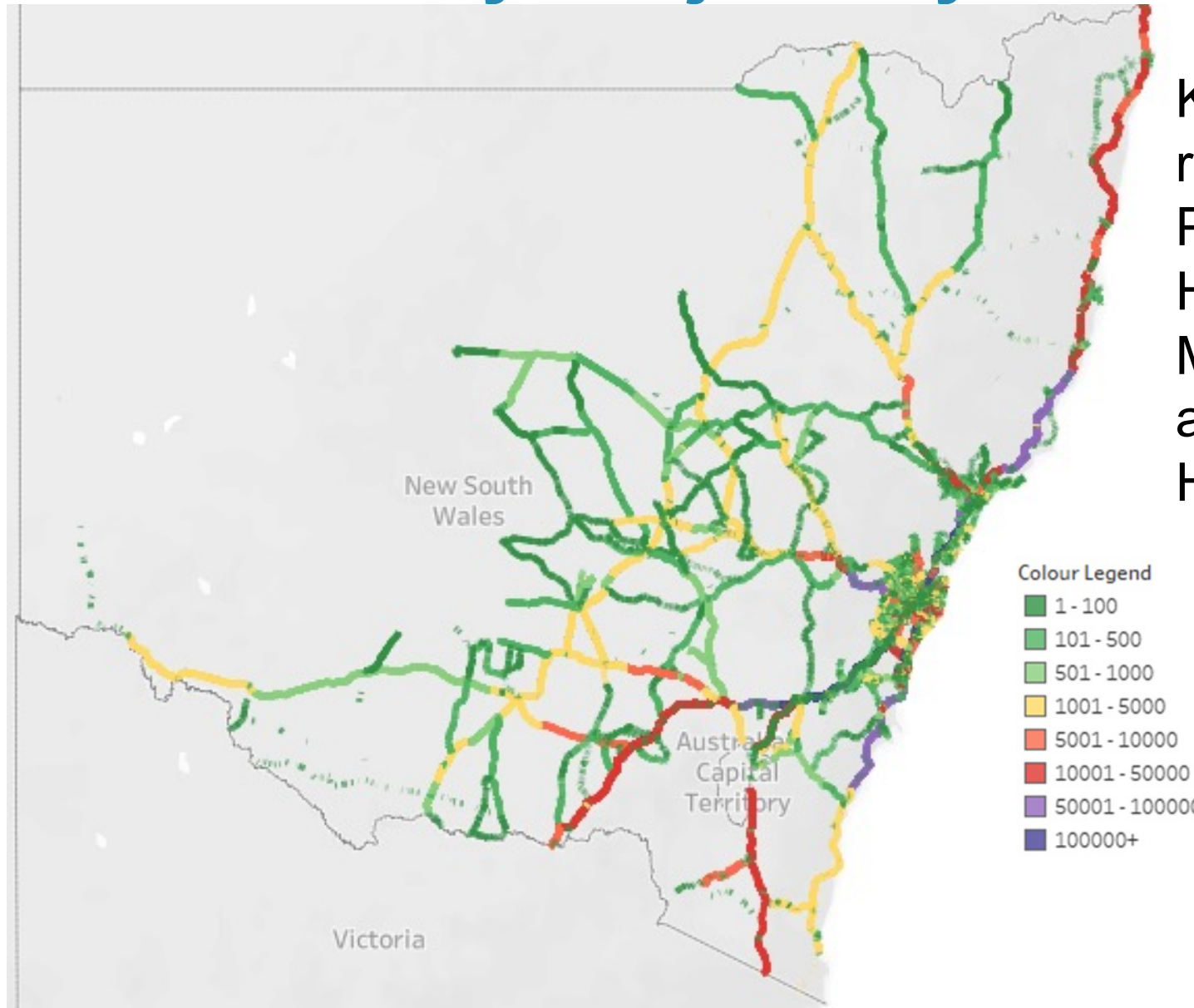


Key hubs outside of Sydney include:

- Newcastle
- Wollongong

Spreading out to regional hubs including:

- Cessnock
- Lithgow
- Orange
- Yass
- Wagga Wagga

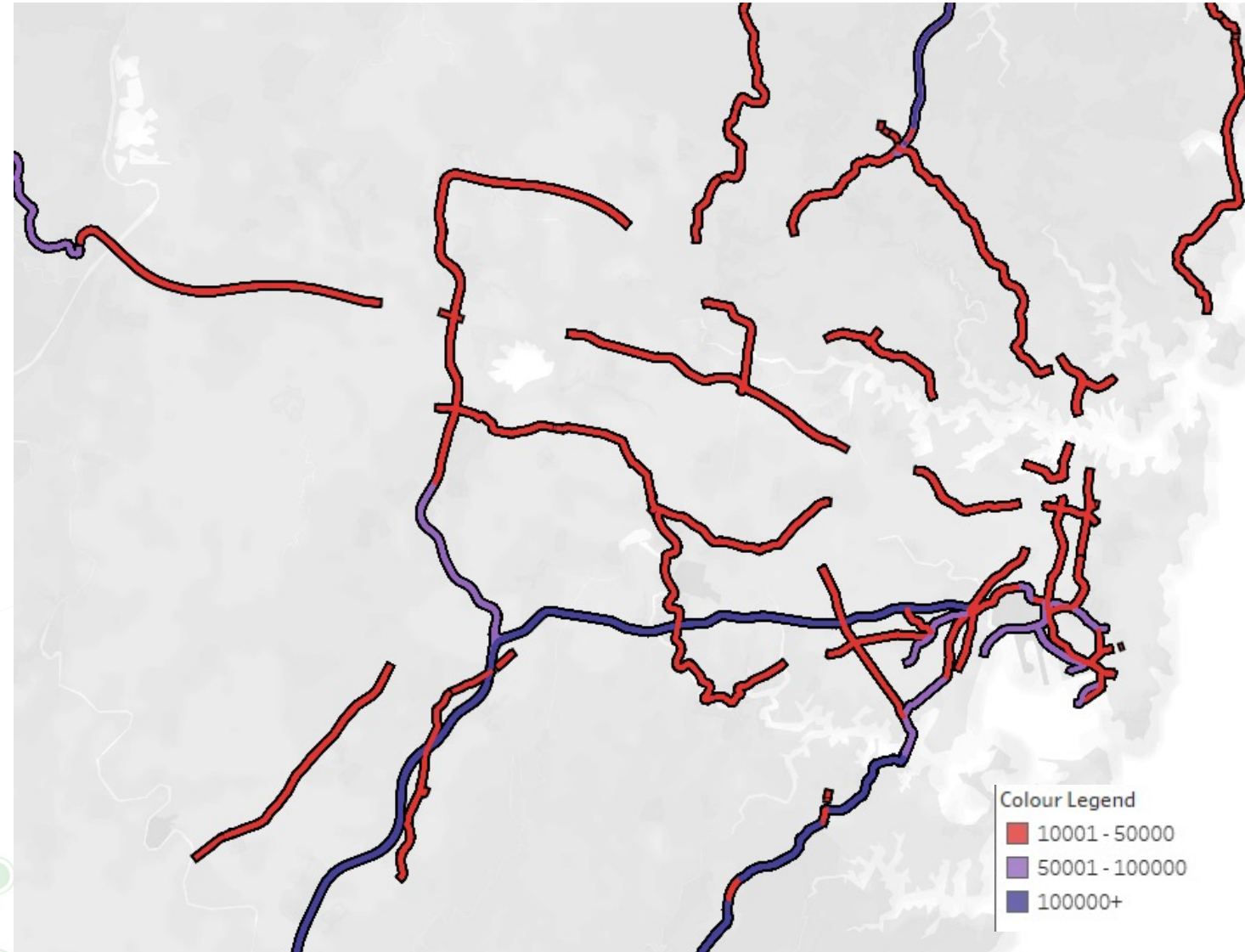


Key regional routes include Princes Hwy, Hume Hwy, Monaro Hwy and Western Hwy

Greater Sydney Metropolitan region

Primary DG routes include:

- Ring road network
- Pacific Hwy and Old Northern Rd (nth)
- Western Mwy,
- Princes and Hume Hwys (sth)
- Port Botany
- Syd Harbour bridge and Harbour tunnel
- Victoria Rd
- Parramatta Rd
- Horsley Dr
- Henry Lawson Dr
- King Georges Rd
- Forest Rd



Learnings

Industry are willing to share data with government under the right consent arrangements, data privacy protections and guarantees.

Having a 'safe harbour' for data to be stored and aggregated, separate from government was identified by some operators as critical for participation.

Data is of varying quality, which significantly complicated the analysis:

- Standard 30 second polling records from telematics devices.
- Longer polling times which could be up to 5 minutes.
- 'Event driven' records (when braking, switching engine off etc) which could be very widely spaced outside metro areas.

Further learnings

TCA has provided each participating transport operator with a personalised dashboard of their own data.

ARRB has undertaken detailed analysis of data and provided these insights to TfNSW.

Future areas for investigation include more granular analysis of:

- Movements to and from specific precincts such as Ports
- Analysis of specific corridors under pressure of urban consolidation
- National travel patterns and trends.

With increasing complexity of analysis, and increasing volumes of data, TCA is investing in enhanced analytical systems to support road managers in undertaking analysis

Future opportunities

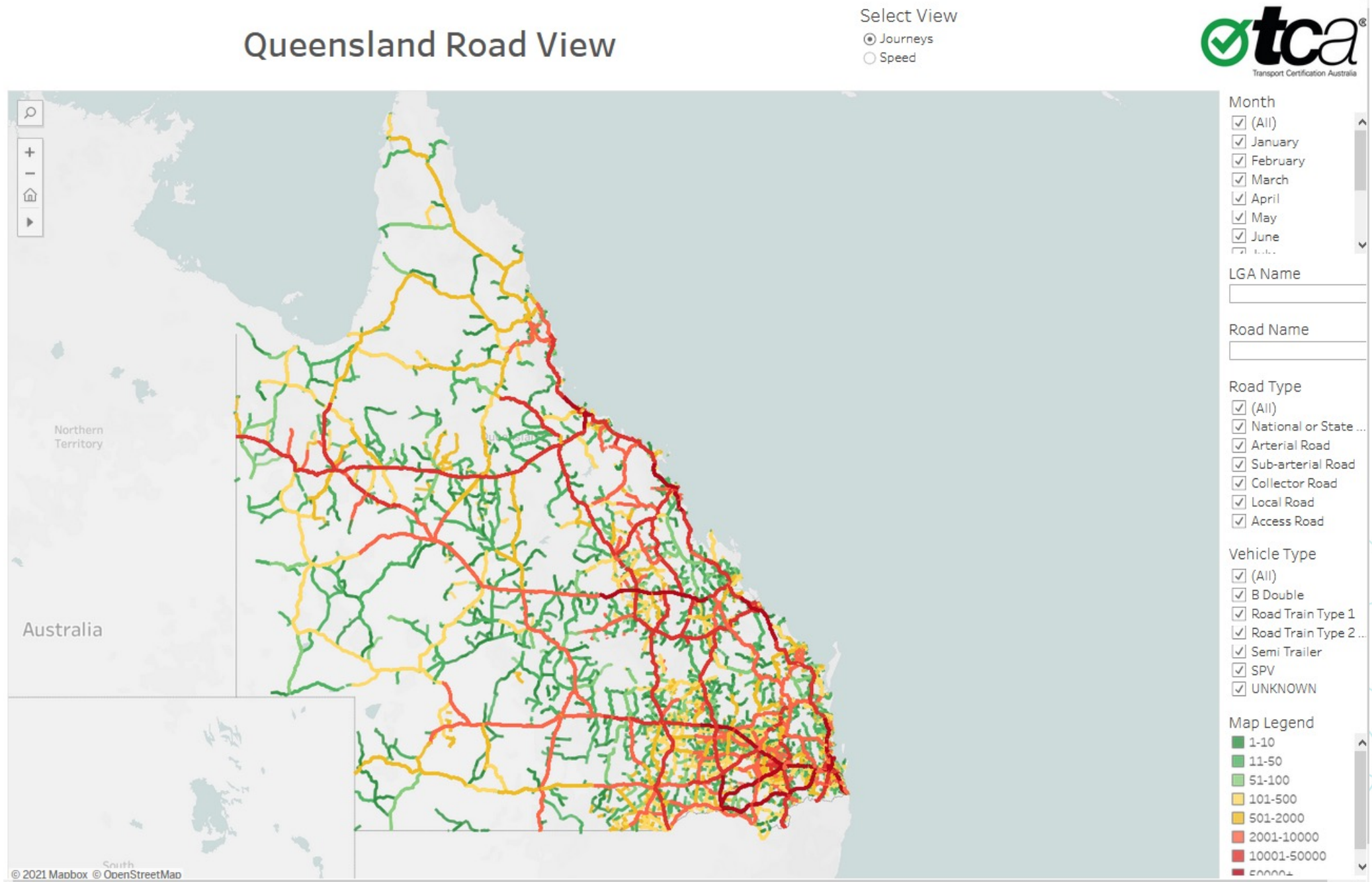
There are significant opportunities for future data collection.

This research has significant potential to provide valuable insights into the movement of DG vehicles across the nation, between states, or in specific local geographical areas and structures (such as bridges and tunnels).

Periodical repeat of the survey would show trends and allow more granular analysis over time.

Similar methodology used for OSOM vehicles in Qld, and other pilots.

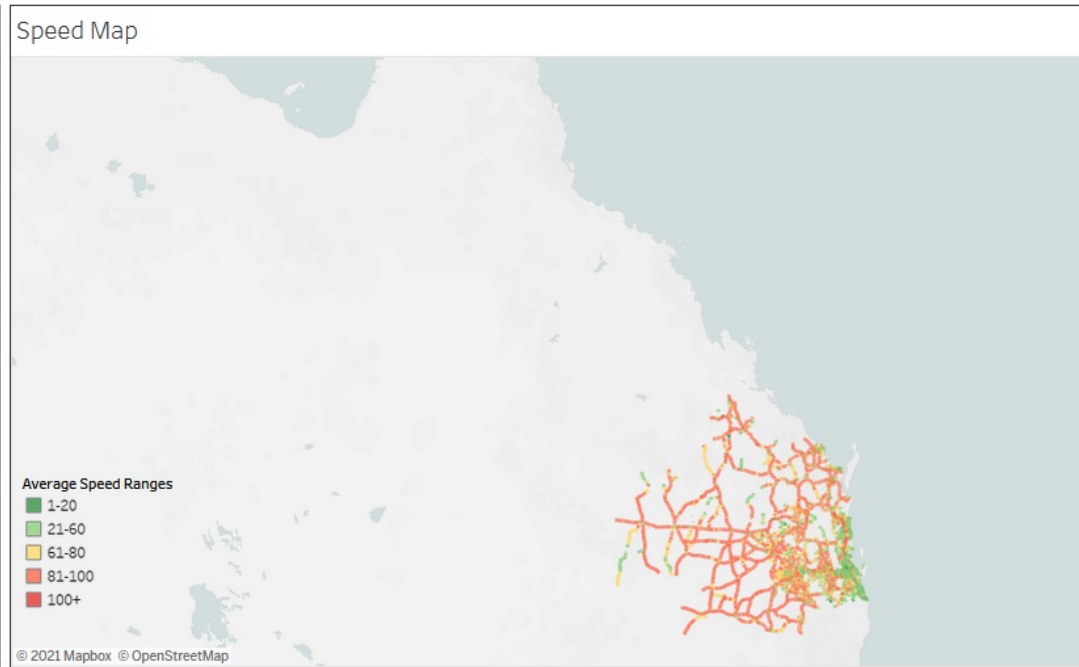
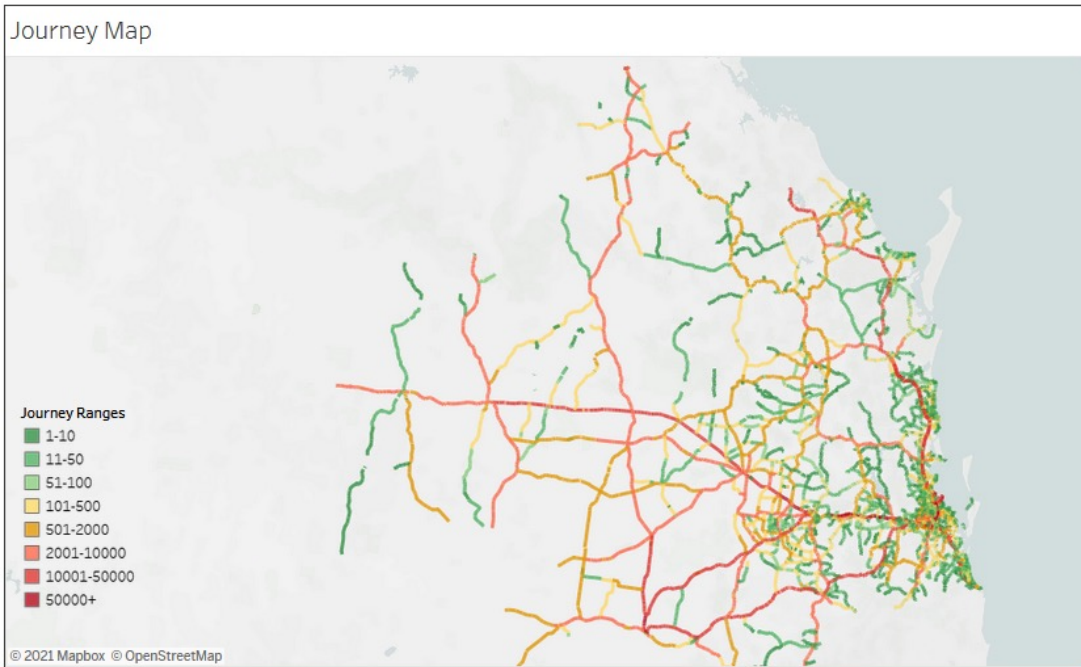
Road use analysis



Trend analysis of SEQ



Queensland Road Network



Select LGA

Australia

LGA Name
(All)

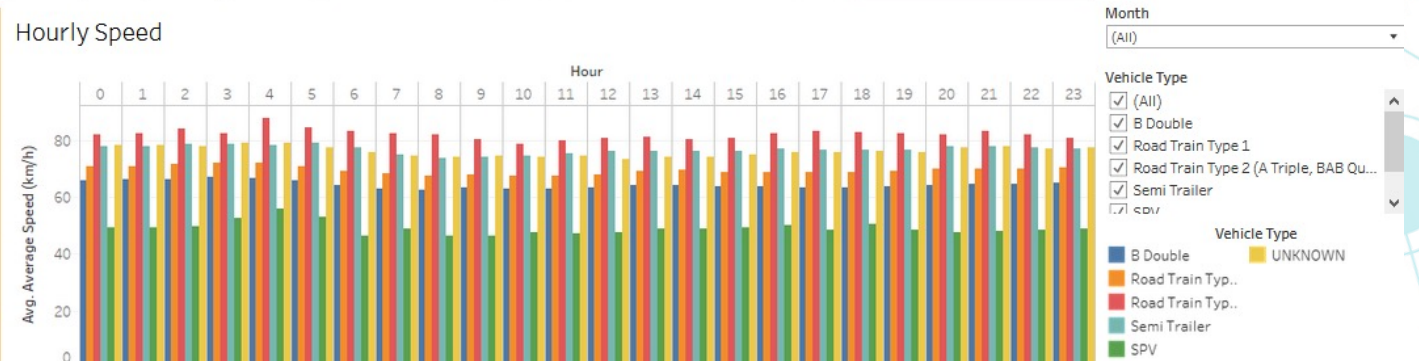
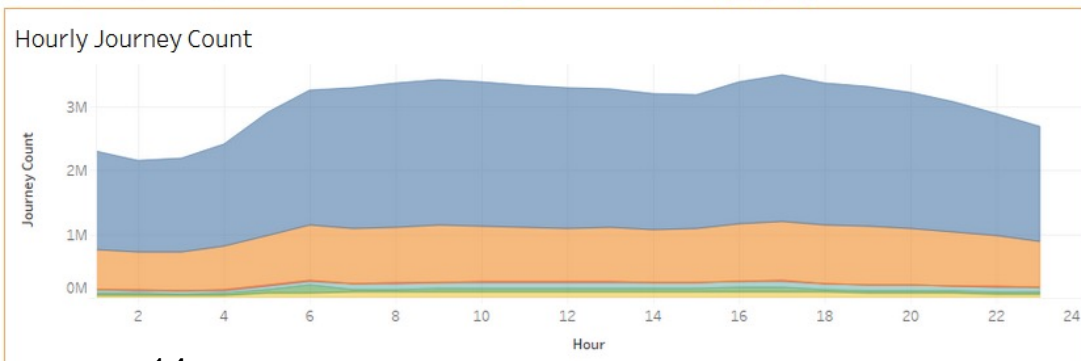
Road Type

- (All)
- Arterial Road
- Local Road
- National or State Highway
- Sub-arterial Road

Road Name

Road Segment ID

Month
(All)



Other developments in technology

Near real-time data for traffic optimisation, congestion monitoring, specific vehicle route planning, and research

Two-way data flows:

- Data on vehicle speeds, density, queue times etc to road managers
- Data on traffic lows, journey reliability, congestion, rest area availability and queue times back to operators

TCA facilitating machine readable RAV maps for telematics providers to support in-vehicle routing to legal networks

TCA thanks TfNSW, ARRB, and the many transport operators and drivers who agreed to participate in this research study.