



# National Telematics Framework: Setting a Benchmark for Intelligent Access

20 September 2023



# Today's Moderator

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*We acknowledge the Australian Aboriginal and Torres Strait Islander peoples as the first inhabitants of the nation and the traditional custodians of the lands where we live, learn and work. We pay our respects to Elders past, present and emerging for they hold the memories, traditions, culture and hopes of Aboriginal and Torres Strait Islander peoples of Australia.*

*Austrroads acknowledges and respects the Treaty of Waitangi and Maori as the original people of New Zealand.*

# About Austroads & TCA

## Austroads is the collective of Australasian transport and traffic agencies

- Transport for NSW
- Department of Transport and Planning Victoria
- Department of Transport and Main Roads Queensland
- Main Roads Western Australia
- Department for Infrastructure and Transport South Australia
- Department of State Growth Tasmania
- Department of Infrastructure, Planning and Logistics Northern Territory
- Transport Canberra and City Services Directorate Australian Capital Territory
- Department of Infrastructure, Transport, Regional Development, Communications and the Arts
- Australian Local Government Association
- Waka Kotahi NZ Transport Agency

## Transport Certification Australia (TCA) is a national organisation that provides assurance services relating to transport technologies and data to enable improved public purpose outcomes from road transport.

Key aspects of TCA include:

- An independent not-for-profit entity, with government oversight
- Administration of the National Telematics Framework, including its rules, specifications, agreements, digital infrastructure and other supporting services
- Assurance services that support but are appropriately separated from regulators, policy makers and enforcement activities, and underpin telematics applications and associated information and data services
- Advice that is based on evidence and a deep subject matter knowledge
- Trusted partner to both government and industry stakeholders, enabling a nationally consistent open market, with services covering all road vehicle types and associated digital infrastructure.



# Housekeeping



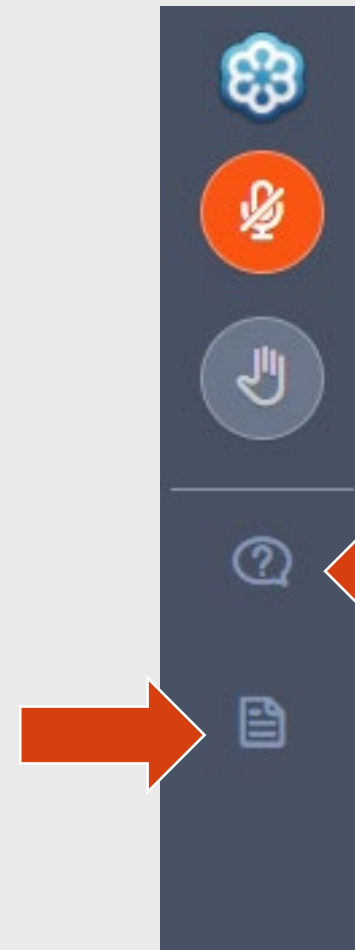
Presentation = 30 mins

Question time = 15 mins



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20 September 2023



Type questions here  
Let us know the slide number your question relates to



# Today's Presenters and Agenda

Topic	Presenter
Introducing Intelligent Access	Gavin Hill
Understanding the Swedish model of intelligent access	Thomas Asp (presentation pre-recorded)
Social Network Analysis and the Intelligent Access Program	Dr Christopher Walker
Q & A	Gavin Hill and Dr Christopher Walker



## Gavin Hill

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# Introducing Intelligent Access

Gavin Hill

General Manager | Strategy and Delivery  
Transport Certification Australia (TCA)



# Who we are

**Transport Certification Australia (TCA) is a national organisation that provides assurance services relating to transport technologies and data to enable improved public purpose outcomes from road transport.**

Priority outcome areas enabled by TCA services include improved road safety, transport efficiency, freight productivity, asset management and sustainability.



## Key aspects of TCA include the following:

- An independent not-for-profit entity, with government oversight and ownership through Austroads
- Administration of the National Telematics Framework including its rules, specifications, agreements, digital infrastructure and other supporting services
- Assurance services that support but are appropriately separated from regulators, policy makers and enforcement activities, and underpin telematics applications and associated information and data services
- Advice that is based on evidence and a deep subject matter knowledge
  - Trusted partner to both government and industry stakeholders, enabling a nationally consistent open market, with services covering all road vehicle types and associated digital infrastructure.





# Intelligent Access

Intelligent Access is defined as a system that remotely monitors vehicles to ensure they comply with their agreed operating conditions...

...ensuring they operate how, where, and when they should.

It was first conceived as a concept in the mid-1990s to advance productivity, safety and efficiency reforms in Australia utilising:

- In-vehicle technologies
- Global Navigation Satellite System (GNSS)
- Global System for Mobile communications (GSM).



# Different Types of Intelligent Access

## A continued evolution driven by innovation

Different applications of intelligent access have been introduced to cater for different uses *and* users.

Road Infrastructure Management (RIM) application

Telematics Monitoring Application (TMA)

Intelligent Access Program (IAP) application

Smart OBM

Intelligent access is now an integral part of Australia's regulatory landscape for heavy vehicles. It has enabled road managers to change the way they manage networks, leading to significant gains in productivity and safety.



# Different Tools for Different Jobs



	Road Infrastructure Management (RIM)	Telematics Monitoring Application (TMA)	Intelligent Access Program (IAP)
Aggregated, de-identified data	✓	✓	✗
Identifiable vehicle data	✗	✓	✓
Evidentiary data for enforcement	✗	✗	✓
Cost (to transport operators)	←—————→		
<b>Serving suggestions</b>	Use for <b>road use analysis/planning</b>	Use for <b>lower-risk</b> activities (education & regulatory improvement activities)	Use for <b>higher-risk</b> activities (direct compliance & enforcement)



# International Developments

Other regions are now adopting their own versions intelligent access.

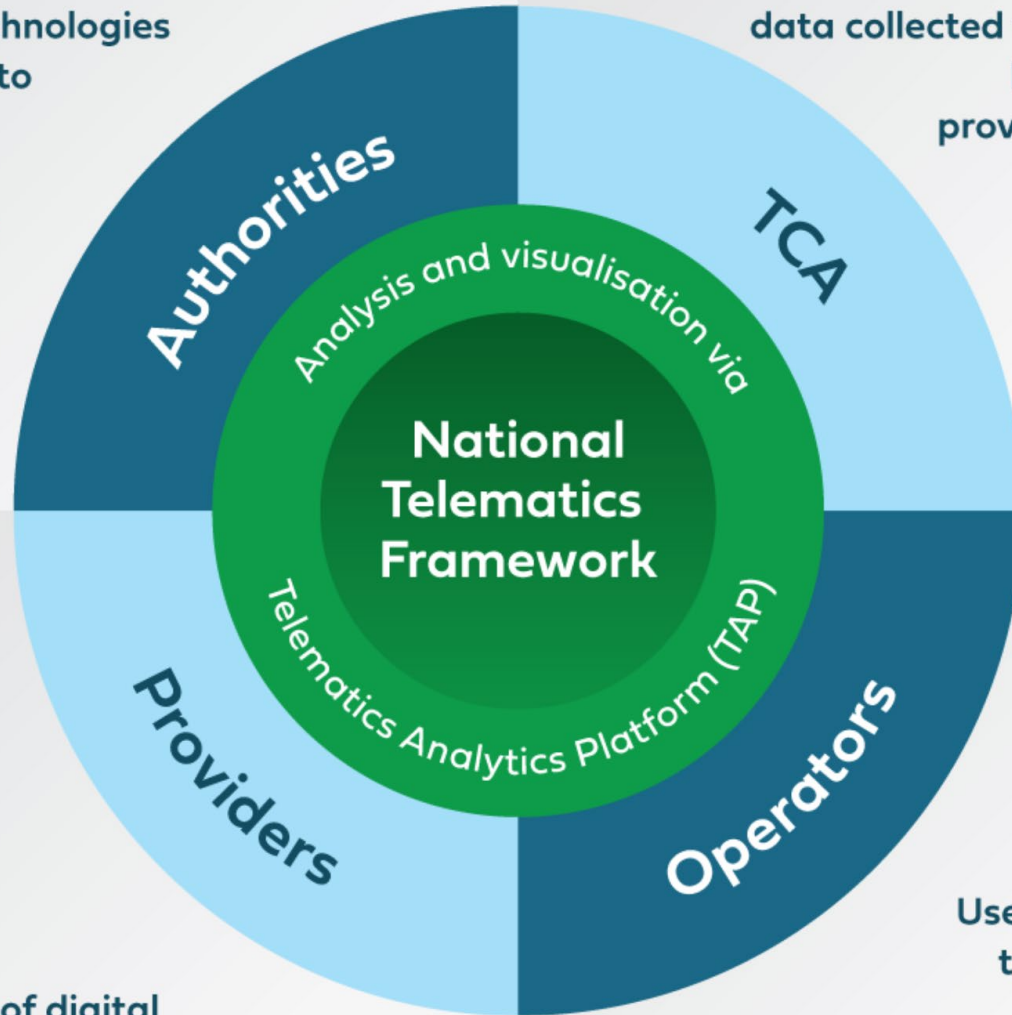
Although different, the similarities outweigh the differences.

At the centre of all developments are structured interactions between:

- Authorities
- Providers
- Operators

Government agencies and other parties that use digital technologies and data to advance public outcomes

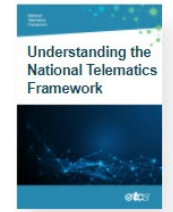
Administrator of the Framework; management of data collected through the Framework; provision of TAP services to data users



Providers of digital technologies and associated services

Users of digital technologies recognised through the Framework

UNDERSTANDING THE FRAMEWORK



COMMON FRAMEWORK COMPONENTS



DIFFERENT ASSURANCE LEVELS FOR APPLICATIONS



USE OF THE FRAMEWORK



# An International Standard

The NTF was recognised as an international standard by the International Standards Organization (ISO) in 2012.

## ISO 15638

Framework for cooperative telematics applications for regulated commercial freight vehicles (TARV).

The standard consists of 23 parts which leverage relationships between:

- In-vehicle systems
- Application service providers
- Other digital infrastructure.



# The NTF Enables Reform by Creating Value

The National Telematics Framework evolved (and continues to evolve) from the shared interests of different stakeholders.

## Road agencies

...want improved ways to understand how their infrastructure is used

## Regulators

...want contemporary tools to manage compliance

## The transport industry

...want improved productivity and access to the road network, coupled with suitable protections for the collection, sharing and use of data

## The technology industry

...want confidence to invest in an open, competitive and structured marketplace

## Vehicle and trailer manufacturers

...want confidence that new and innovative vehicles could get access to the road network







# Understanding the Swedish model of intelligent access

Thomas Asp  
Swedish Transport Administration

National Telematics Framework: Setting a Benchmark for Intelligent Access Webinar  
20 September 2023

# Content

- The complexities of Swedish road transport.
- The concept of intelligent access in Sweden and examples.
- The benefits of an intelligent access program for Sweden and lessons learned from the Australian model.



# The complexities of Swedish road transport

- Sparse and unevenly distributed population means limited budget and long distances.
- Large mining and forestry industries with low-value goods cannot bear high transport costs.
- Increasing demands on energy efficiency and reduced climate impact.
- The need for freight transport increasing faster than the capacity can be expanded.
- Shortage of drivers.

# Intelligent Access (IA) in Sweden: Why is it needed?

- Authorities must be able to trust that heavy vehicles only drive where they are permitted.
- Vehicles are getting more and more connected, which makes easier and cheaper to introduce IA.

# The Australia – Sweden Cooperation

- **2009-2010:** A state-of-the-art review showed that Australia was in the lead regarding both Intelligent Access and Performance Based Standards vehicles.
- **2011:** The first meetings and a visit to Australia.
- **2012:** Memorandum of Understanding signed between Transport Certification Australia (TCA) and Swedish Transport Administration (STA).
- **2012-2015:** Test with Intelligent Access Program (IAP) in Sweden, including:
  - TCA as back-office
  - Transtech (Teletrac Navman) as service provider
  - Sweden as a 7<sup>th</sup> state of Australia.
- **2015 – 2023:** Ongoing discussions that include working with the Conference of European Directors of Roads (CEDR).

# IA research in Sweden

- **2014:** Evaluation of IAP tests.
- **2015-2016:** Project with Swedish "light" version of IAP there we specified requirements.
- **2016-2018:** Pilot with test of requirements.
- **2020-2023:** Ongoing projects, including:
  - HCT in cities (High-Capacity Transports)
  - Allowing higher weights when the ground is frozen
  - Digital dispenses for abnormal transports.

# Framework for IA/HCT vehicle reforms

We have found four important parts for this framework:

- Roads, bridges, and streets adapted to allow High-Capacity Transportation (HCT) vehicles.
- Performance and technical specifications for the HCTs.
- Requirements on operating the HCTs on the HCT road network.
  - Access Schemes
  - Compliance Assurance Schemes.
- A legal, institutional, and telematics framework for the above parts.

# Example Project 1: HCT-City

## Scope:

- More efficient and environmentally friendly transport of building materials in cities through the use of HCT vehicles.
- Pilots include design and test of new optimised trucks and new concepts with connected trucks, roads and bridges.

## Challenge:

- Risk that vehicles may leave the permitted route.

## Solution:

- Using intelligent access control, including geofencing of routes and speeds.



# Example Project 2: IA for frozen roads

## Scope:

- Allowing 74-ton trucks instead of 64-ton trucks when the road is frozen.

## Challenge:

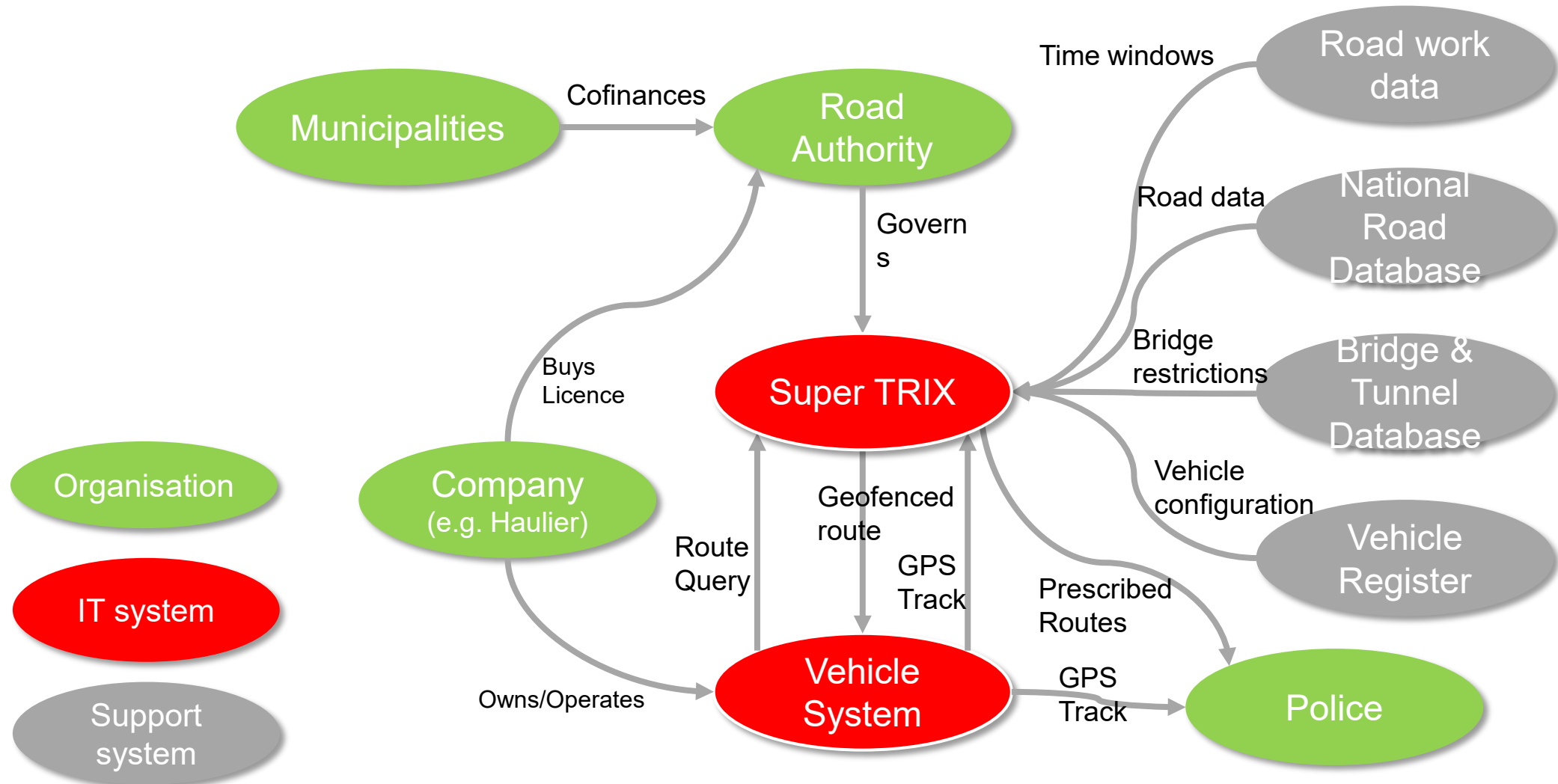
- The bridge bearing capacities are not higher when they are frozen.

## Solution:

- With the help of geofencing, reduce the speed on the bridges
- All involved vehicles need to track their routes and collect their weight.



# Example Project 3: Abnormal transports



# Key takeaways from the CEDR-project

- IA is not used so much in Europe now, but there is ongoing work and interest for IA is growing:
  - Experiences from countries that already use it or have done pre-studies are all positive.
  - All countries could see use cases for IA and could reach policy goals such as better compliance.
  - The most interesting data to collect is position, weight (total and per axle), traffic volume and vehicle type.
- The level of data reliability should be good enough for pre-selection of vehicles, for regulatory or statistical use. Direct enforcement is something for the future.
- All stakeholders, road and vehicle authorities, policy makers, service providers and shippers, could benefit from IA.

# The benefits of an IAP for Sweden and lessons learned from the Australian model

## Lessons learned

- Important to find out which level of compliance you need:
  - Different applications need different levels.
- Need to involve service providers that are different from the OEMs.
- How to collect vehicle data:
  - EU-regulations are a challenge.
- Most importantly, “it made us aware of all the possibilities with the concept of IAP and PBS”.

## Benefits

- Much more efficient use of infrastructure.
- Better traffic safety.
- Fair conditions between companies.

# Thanks for listening

Thomas Asp  
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# Social Network Analysis and the Intelligent Access Program

Dr Christopher Walker

Academic Director (Executive Master of Public Administration)  
Australia and New Zealand School of Government (ANZSOG)



# Outline

- Research focus
- Social Network Analysis
- Methodology
- Sociograms
  - Entire networks
  - Degree centrality
- Findings
- Questions

# Research Focus

1. Regulation of the heavy vehicle industry
2. Policy transfer
3. Social network analysis







Australian road transport sector the most efficient and productive in the world. Vehicle innovation, high dependency for movement of goods, competitive industry, strong regulatory framework and freight rail restricted to bulk goods (iron ore, coal, etc.).

High level of international interest in Australian approaches to industry regulation – particularly the use of telematics.

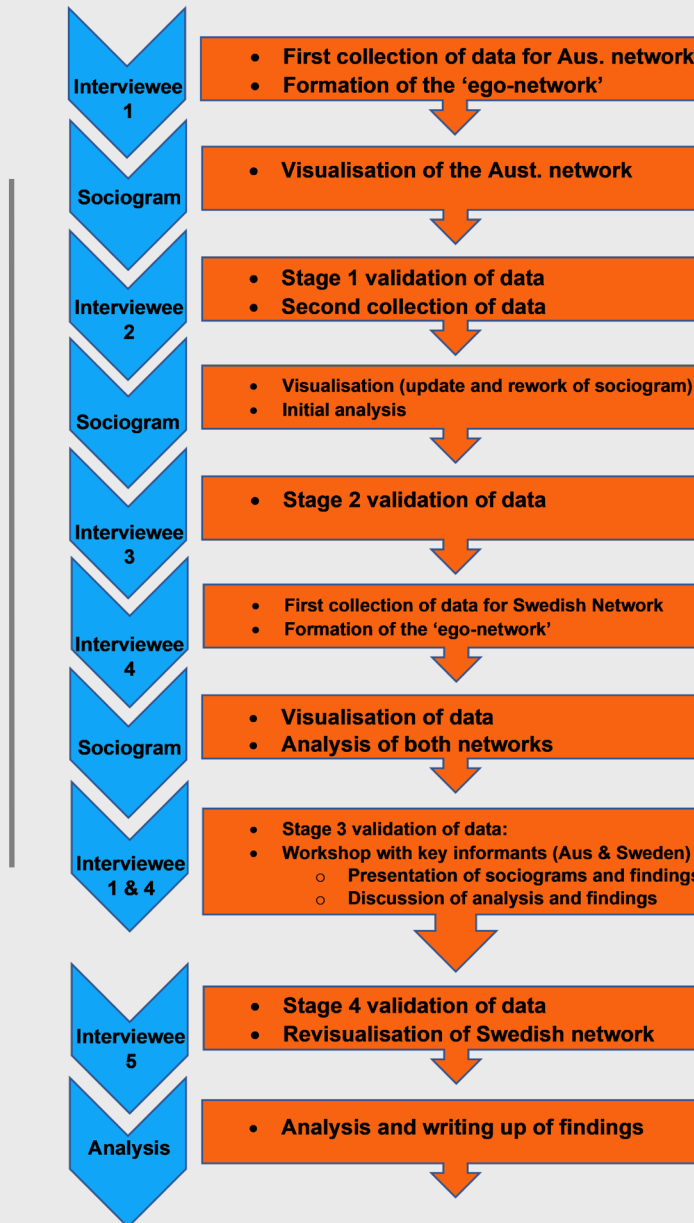


# SNA Definition

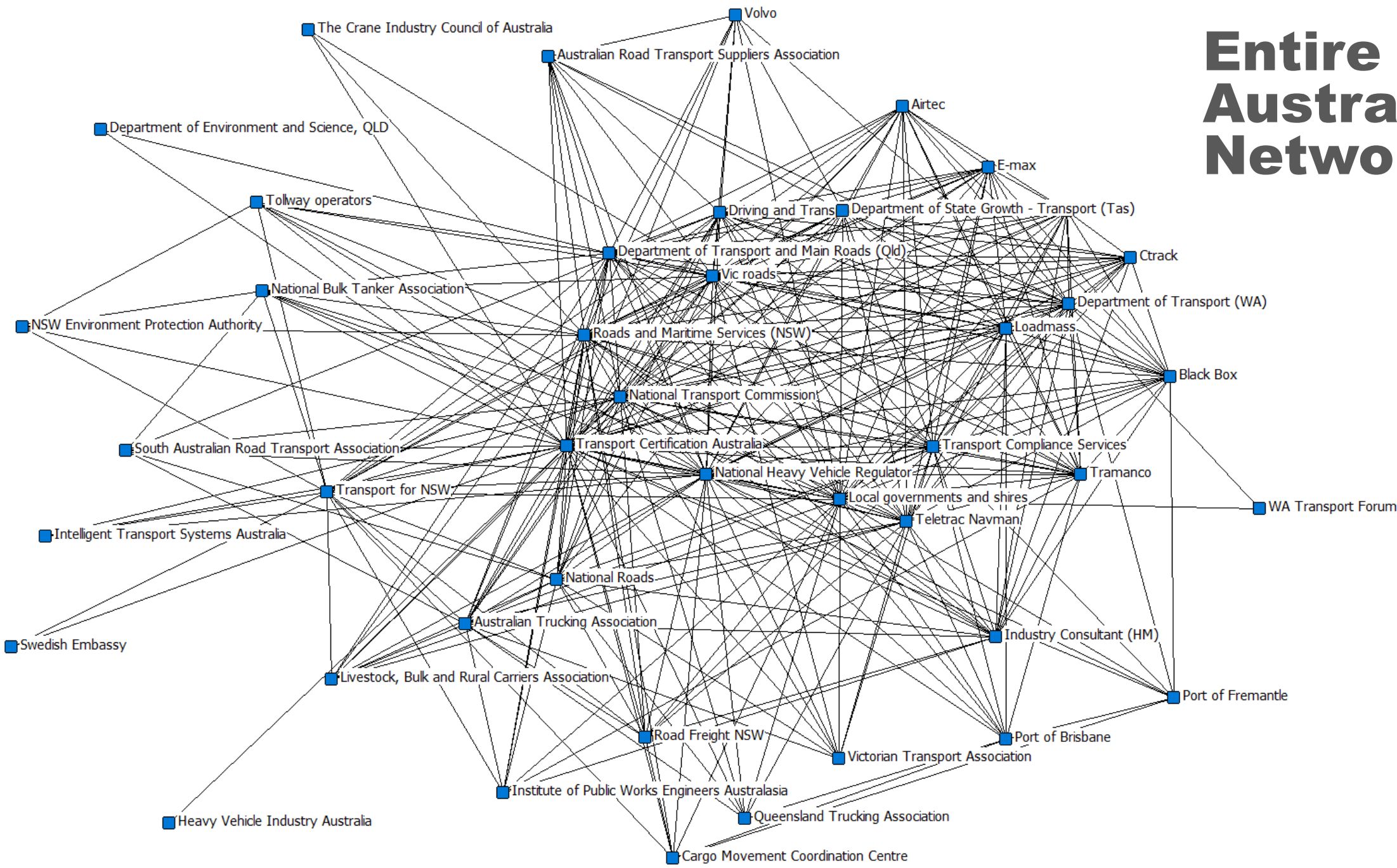
- A methodology that centres networks as the main structure of social systems, foregrounding relationships between actors (or 'nodes') that can be individuals, organisations, collectives and many other entities (Borgatti et al., 2018).
- Sociograms – graphic representations of networks based on data collected.

# Methodology

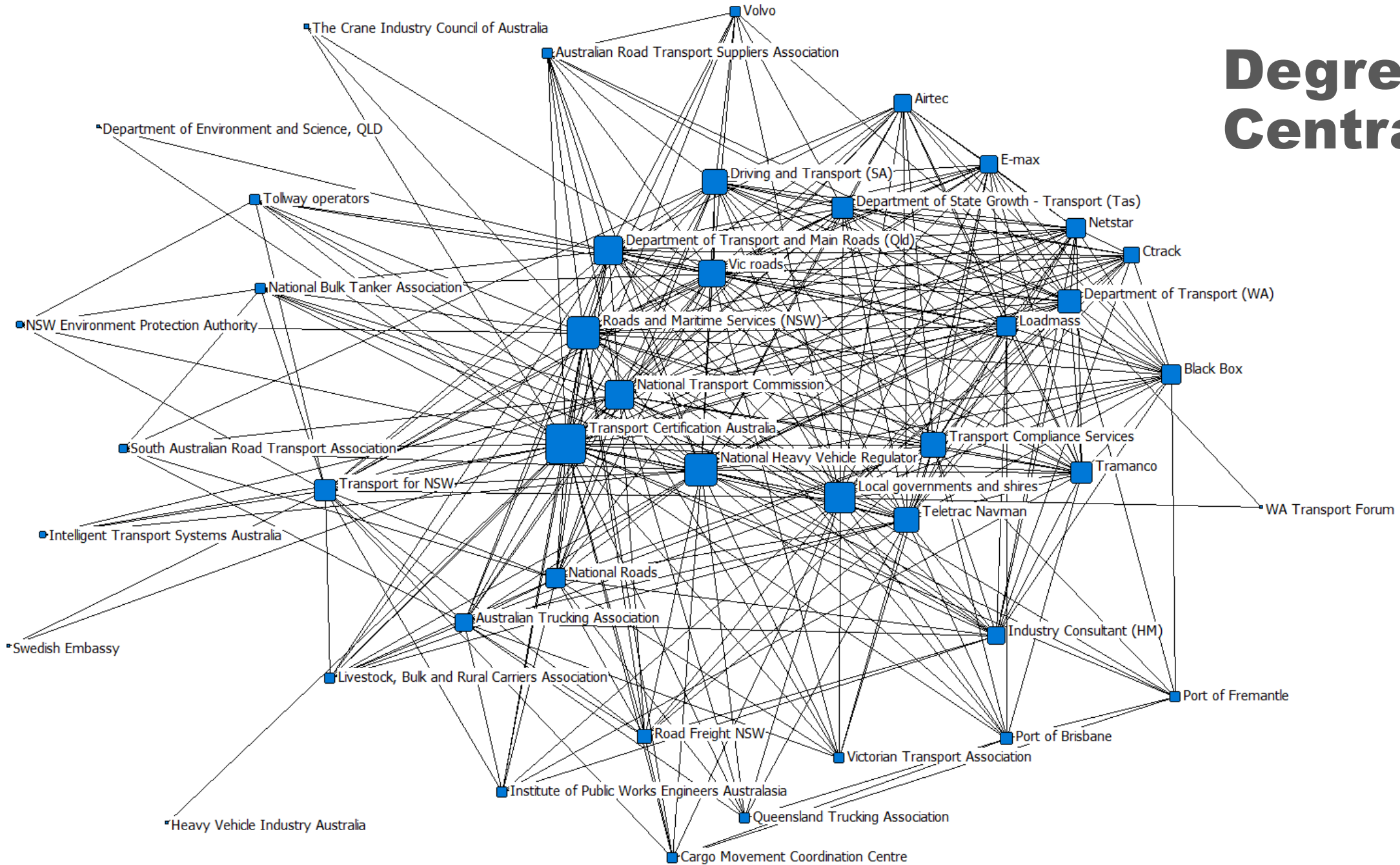
## Methodological Steps – Data collection, visualisation, validation and analysis



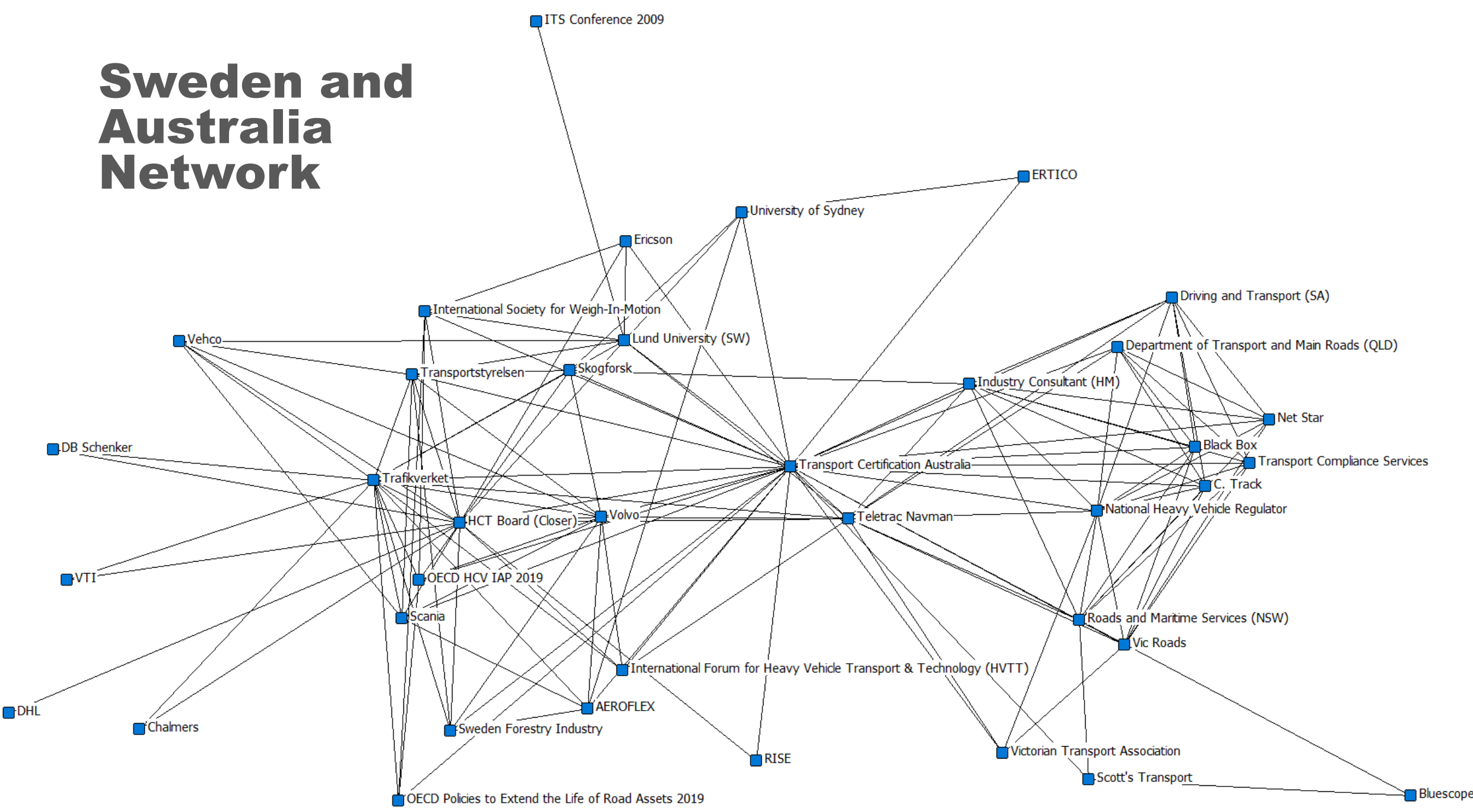
# Entire Australian Network



# Degree Centrality



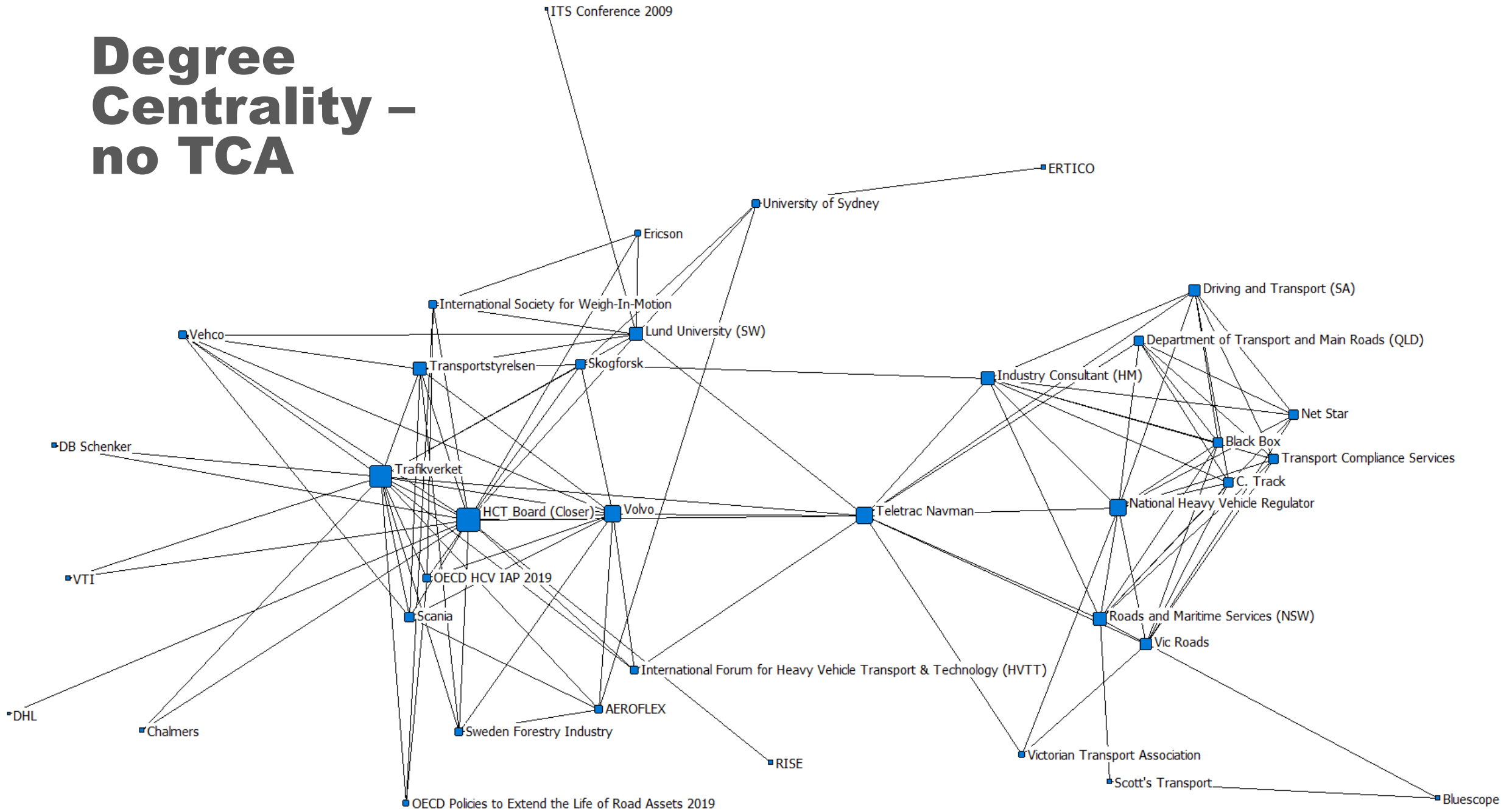
# Sweden and Australia Network







# Degree Centrality – no TCA



# Findings so far

- Dynamics and complexity of policy sector appear more stark and evident from SNA and sociograms.
- Actors at centre of network are identified – may indicate their influence in the policy field.
- Multiple interactions between actors that may not be so evident from only qualitative interviews are highlighted.
- Degree centrality shows TCA is not in control of network nor has the power to reshape the regulatory environment – the strong influence road agencies have in setting the policy limits of the IAP is visible.

# Shortfalls of SNA

- Plotting networks in relation to time - Sociograms are inherently static, so it becomes difficult to express the shifting nature of networks.
- Dependence on individuals' knowledge of networks which can have gaps.
- Binary matrixes – do not express the quality of relationships or frequency of interactions, only that relationships exist.
- Publication: **Walker, C** & Moulis, A. (2022), Understanding policy transfer through social network analysis: expanding methodologies with an intensive case study approach', *Policy Sciences*, doi.org/10.1007/s11077-022-09477-z. <https://rdcu.be/cYhyi>

# References

- Borgatti, S. P., Everett, M. G. & Johnson, J. C. 2018. *Analyzing Social Networks*, London, SAGE Publications.
- Hanneman, R. A. & Riddle, M. 2005. *Introduction to social network methods* [Online]. Riverside, CA: University of California, Riverside Available: <http://faculty.ucr.edu/~hanneman/> [Accessed 10/10/2019 2019].



# Questions?



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# Upcoming Webinars

Topic	Date
Australia and New Zealand Roads Capability Analysis 2022-2032	22 September
2023 National Walking and Cycling Participation Survey	3 October
Update to the Guide to Road Design – Detailed Review of Supplements	5 October
Physical Infrastructure to Support Connected and Automated Vehicles	18 October
Austrroads Vehicle Classification Scheme – Heavy Vehicles	25 October
Austrroads Vehicle Classification Scheme – Light Vehicles	2 November
Austrroads Vehicle Classification Scheme – Measuring Active Transport	9 November

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