Road Transport Management Framework and Principles

26 October 2017

Austroads

Today’s moderator

Eliz Esteban
Communications Officer
Austroads

P: +61 2 8265 3302
E: eesteban@austroads.com.au

About Austroads

The peak organisation of Australasian road transport and traffic agencies

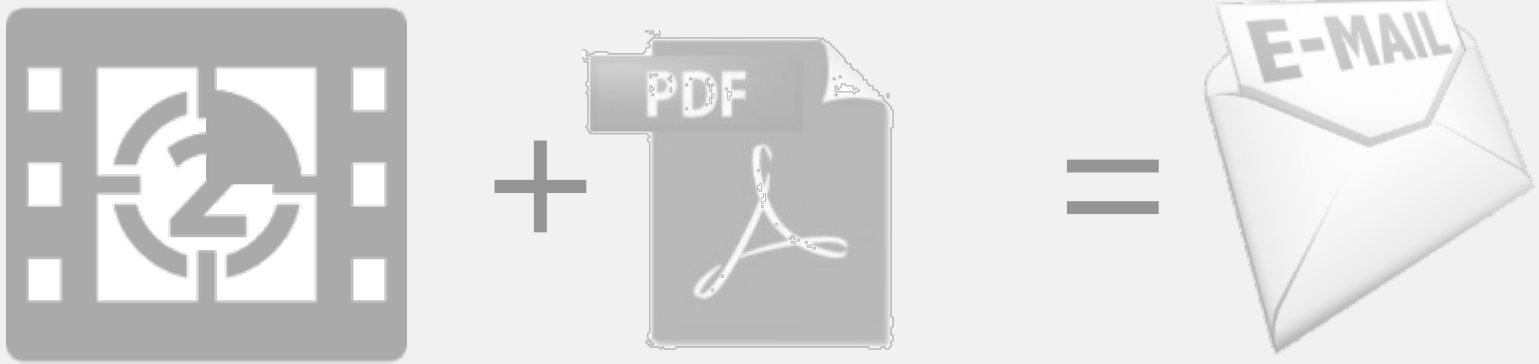
- Roads and Maritime Services New South Wales
- Roads Corporation Victoria
- Department of Transport and Main Roads Queensland
- Main Roads Western Australia
- Department of Planning, Transport and Infrastructure South Australia
- Department of State Growth Tasmania
- Department of Transport Northern Territory
- Transport Canberra and City Services Directorate, Australian Capital Territory
- Commonwealth Department of Infrastructure and Regional Development
- Australian Local Government Association
- New Zealand Transport Agency

Housekeeping

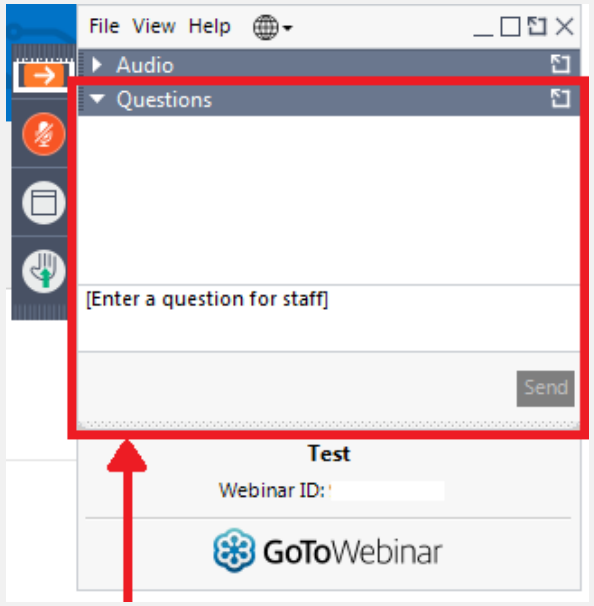
Austroads

Webinar = 35 mins

Question time = 15 mins



GoToWebinar



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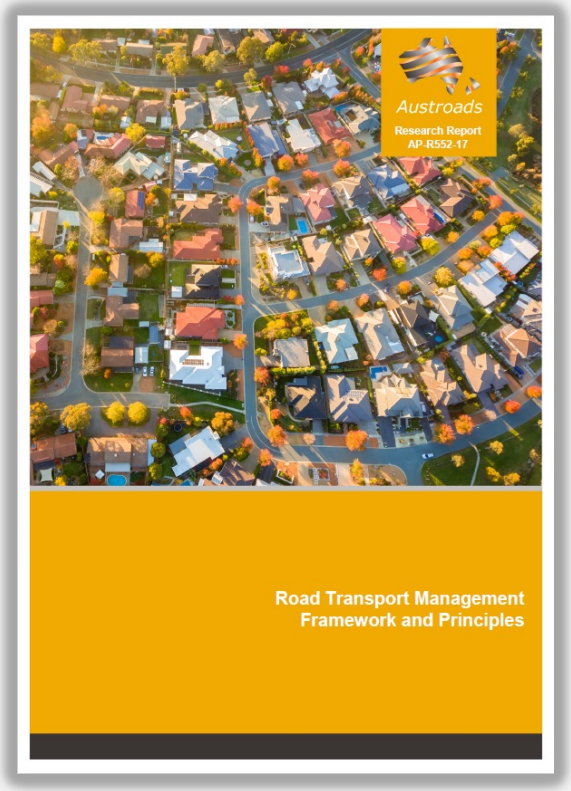
Austroads report



Download from Austroads Website:

https://www.onlinepublications.austroads.com.au/items/AP-R552-17

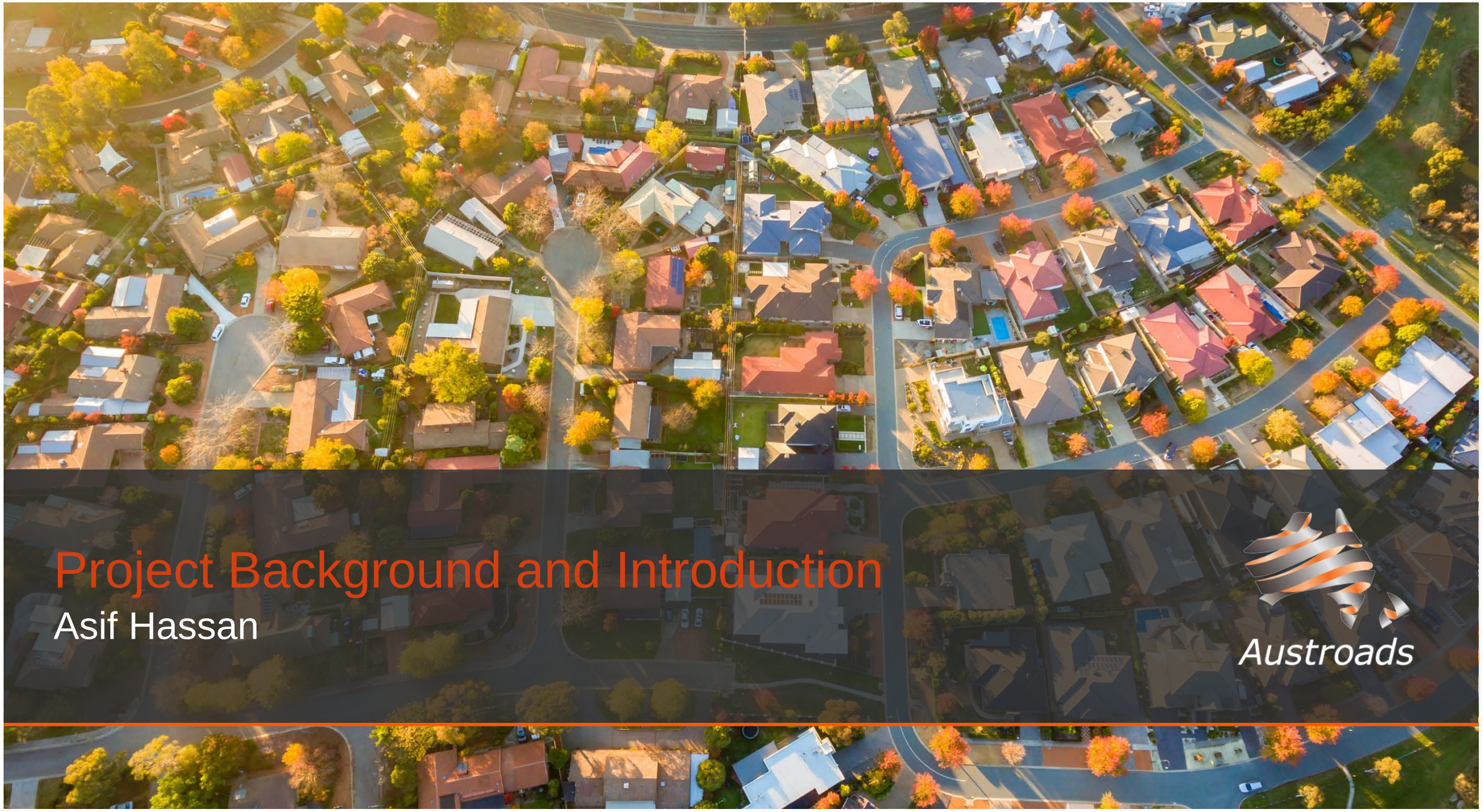
Today’s presenters

Dr Aut Karndacharuk
Senior Research Engineer
Australian Road Research Board (ARRB)
P: +64 2 9282 4405
E: auttapone.karndacharuk@arrb.com.au

Asif Hassan
Professional Engineer
Australian Road Research Board (ARRB)
P: +64 2 9282 4413
E: asif.hassan@arrb.com.au

Agenda

Topic	Presenter
Project Background and Introduction	Asif Hassan
Literature Review Findings	
Current Road Transport Management Practices in Australasia	Dr Aut Karndacharuk
Road Transport Management Framework & Discussion	
Q&A	Both Presenters



Project Background and Introduction

Asif Hassan

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Introduction to team

Project Team

Austroads Project Manager

Cameron Lee

Project Leader, ARRB

Dr Aut Karndacharuk

Team Member, ARRB

Asif Hassan

Review Team

Austroads Project Working Group

Austroads Traffic Management Working Group

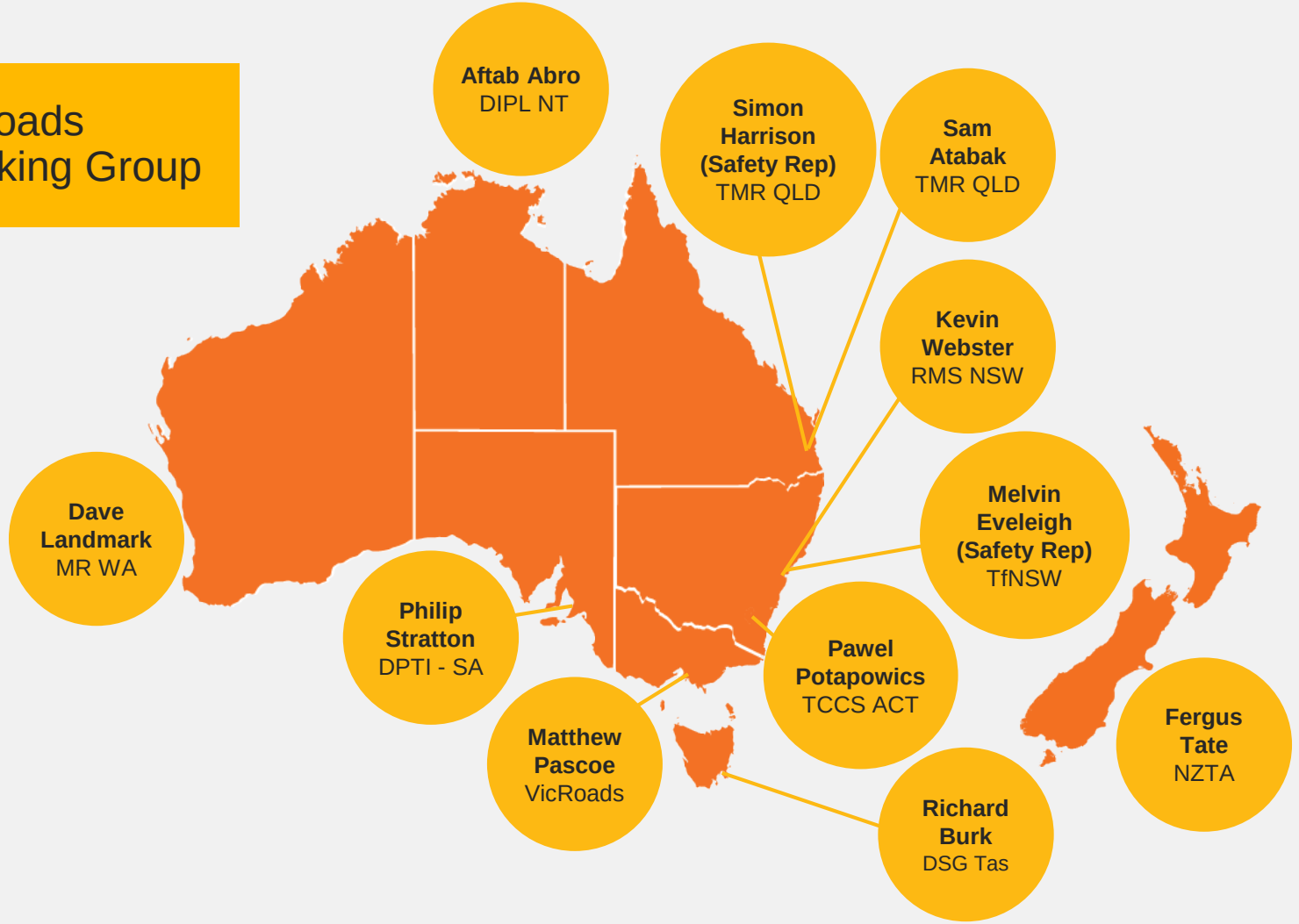
Stakeholders- Road and Traffic Authorities

Austroads Network Task Force

Austroads Board

The Project Team

Austroads
Project Working Group



Background and motivation

See Section 1

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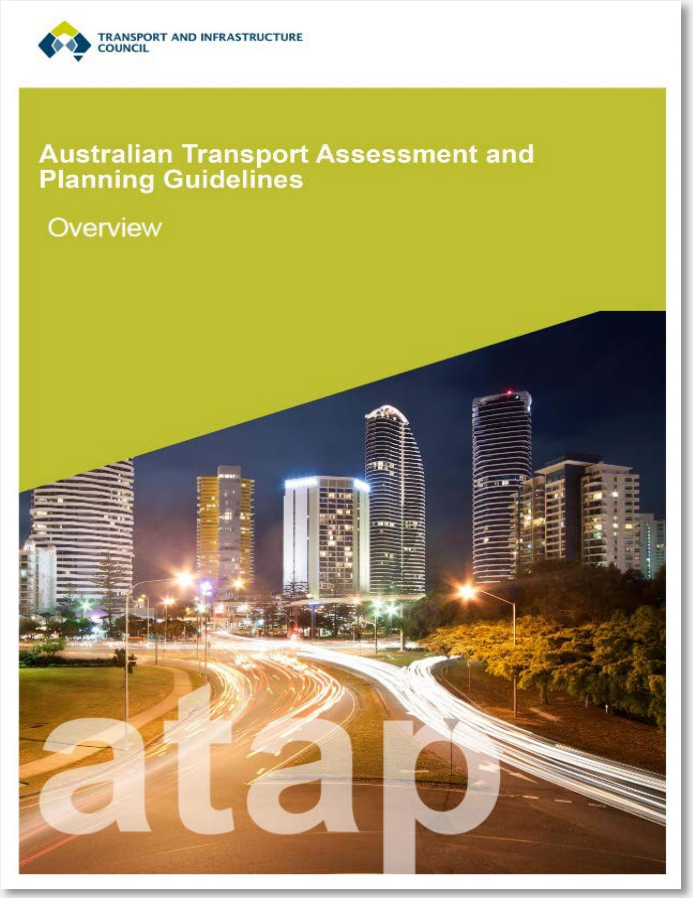
- The *Guide to Road Transport Planning* is being replaced by the *Australian Transport Assessment and Planning Guidelines (ATAP)*
- This Commonwealth document aims at a much higher level of transport planning and does not include New Zealand.
- Austroads has identified the lack of a nationally agreed management framework across the member organisations as a gap in Road Transport Management knowledge.



Project objectives

See Section 1

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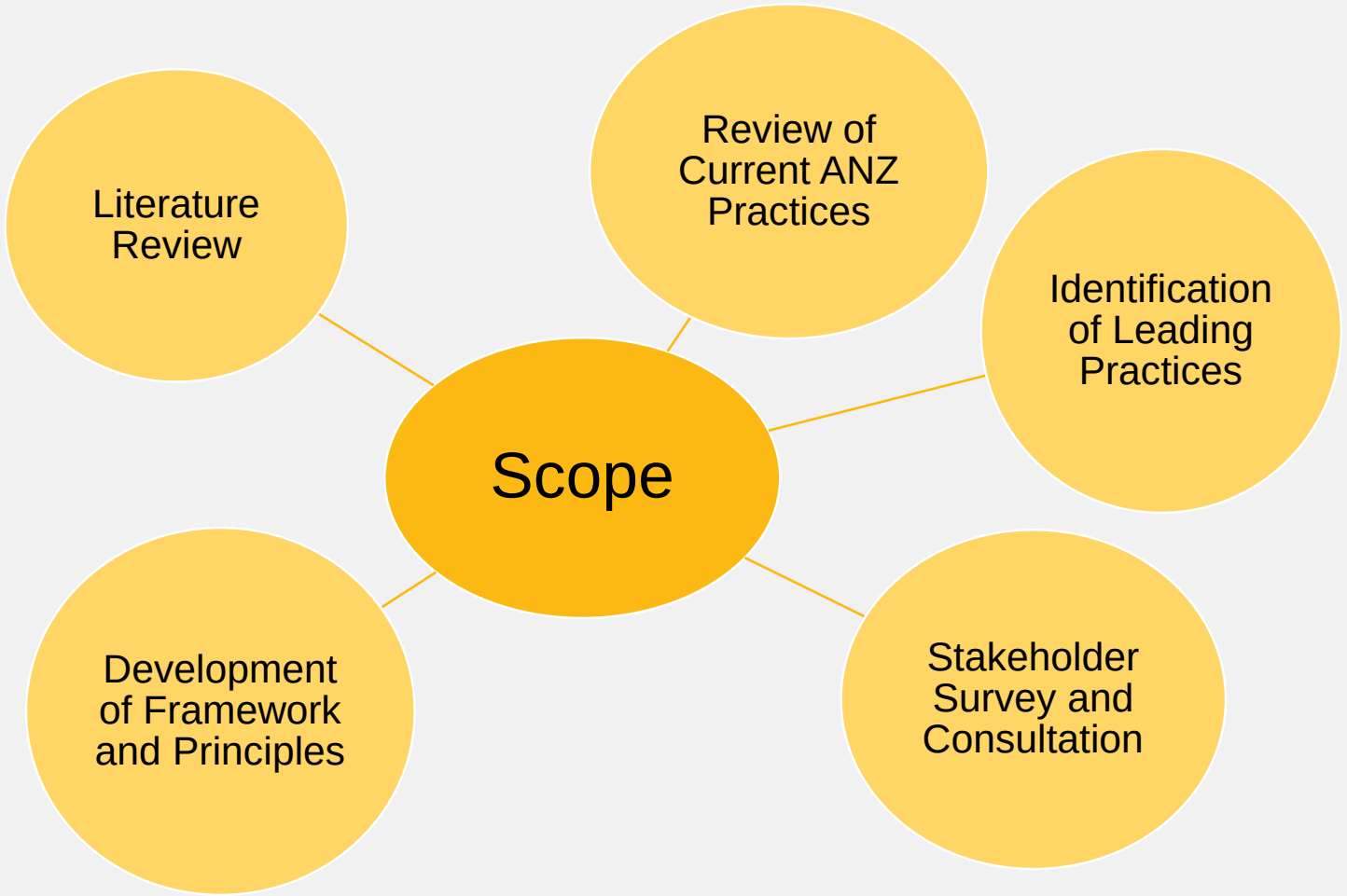

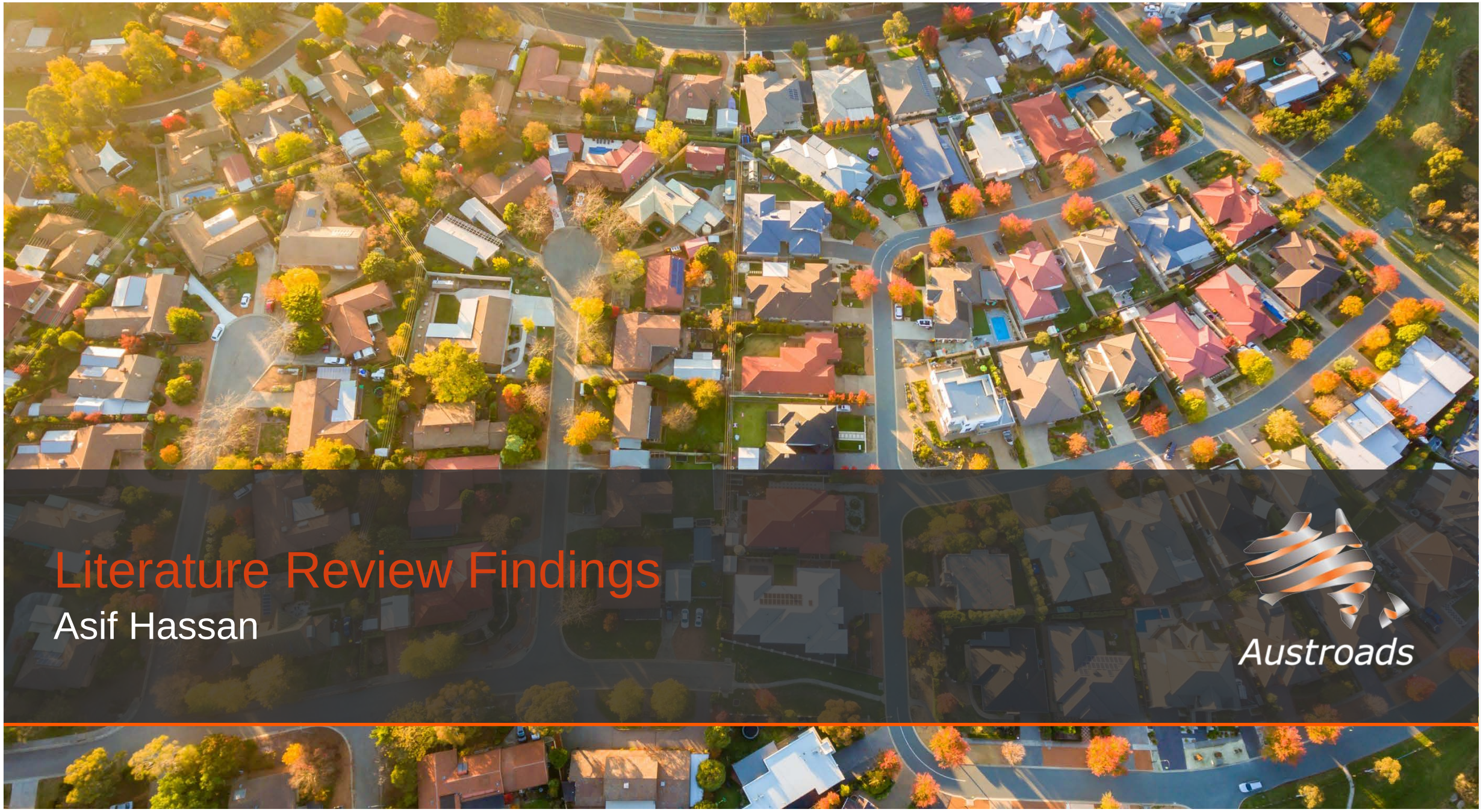

Literature Review Findings

Asif Hassan

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Literature review

See Section 1

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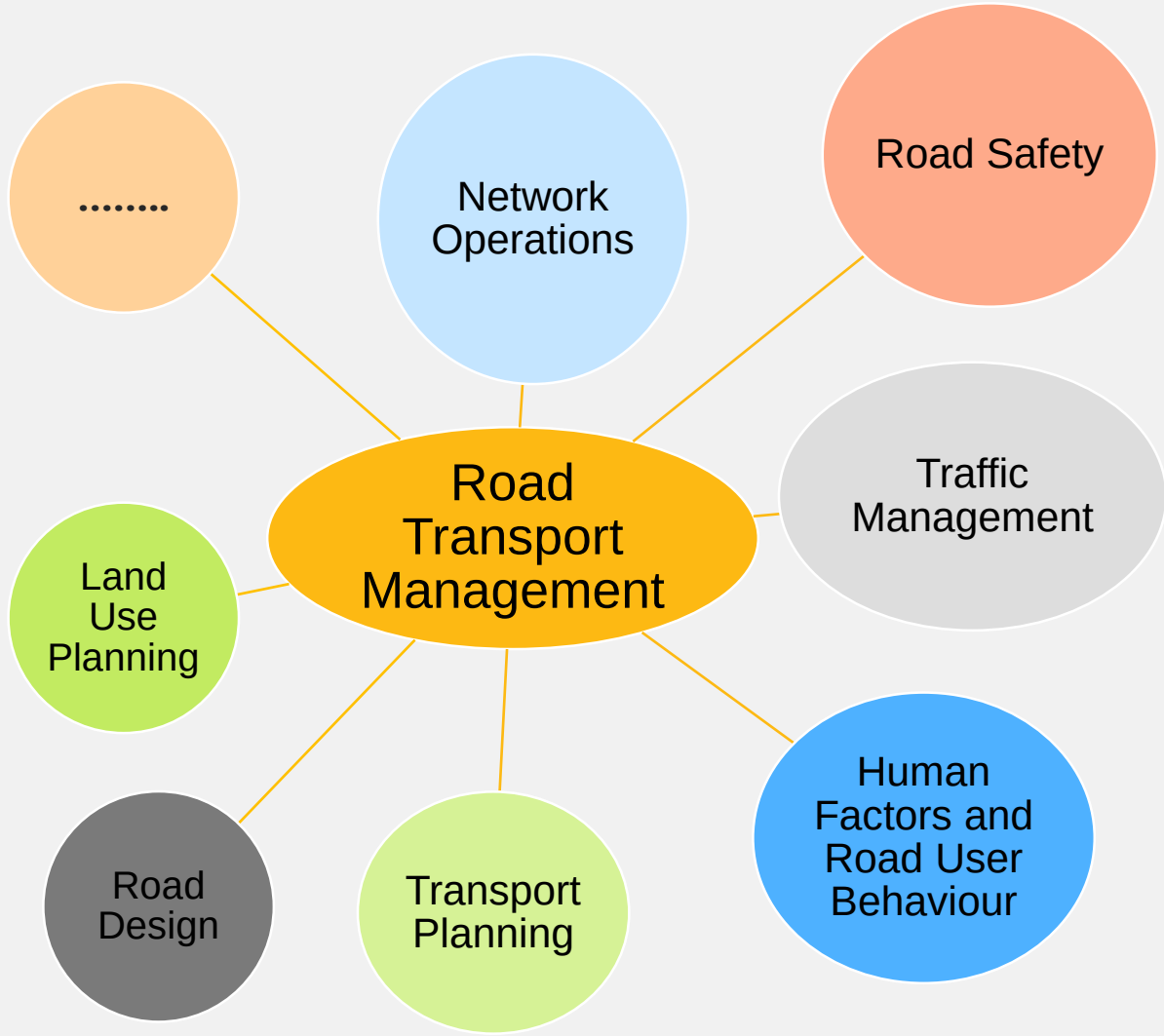

Ultimate goals of Road Transport Management (RTM) …

- Safe
- Efficient
- Reliable
- Sustainable

Road Transport Management Principles

See Section 2

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1. Multimodal network operation planning.
2. Functional road classification.
3. Well-connected transport network infrastructure.
4. Traffic control devices and techniques.
5. Traffic calming and local area traffic management.
6. Traffic incident management.
7. Lifecycle asset management.
8. Integrated transport and land use planning.
9. Parking strategy and management.
10. Travel demand management.
11. Safe System approach and principles.
12. Electric, connected, autonomous vehicles.
13. Transport sustainability and resilience.
14. Human factors and road user behaviour.
15. Stakeholder collaboration and engagement.

1. Multimodal Network Operation Planning

See Section 2.1

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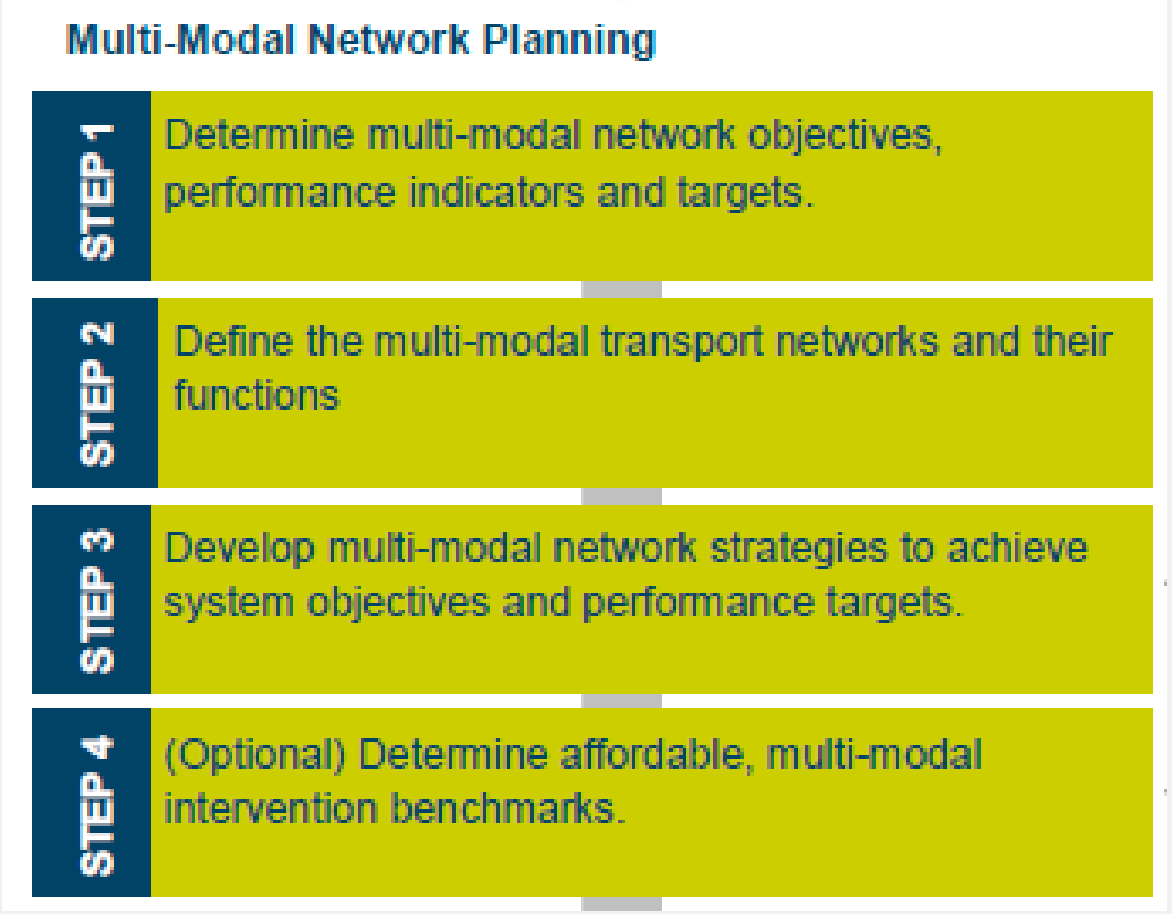
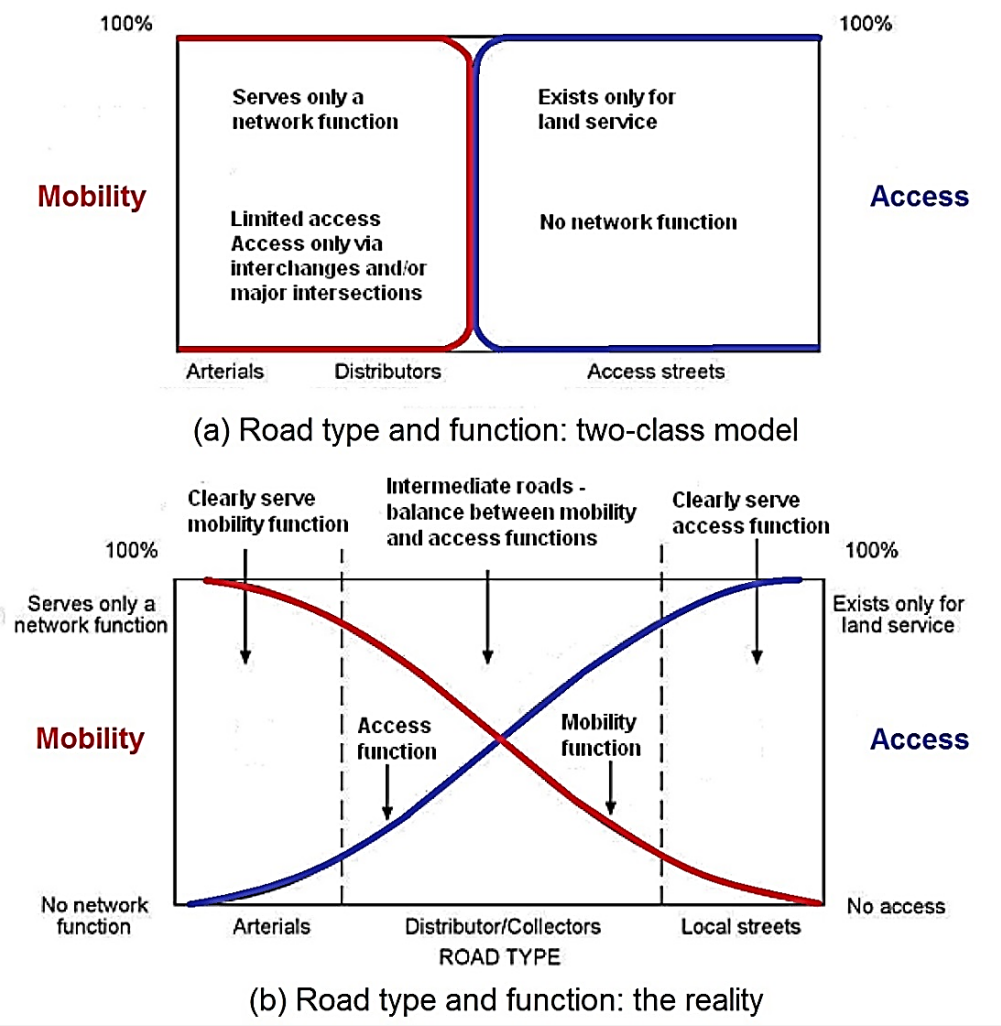
- Road network operation planning is relatively new and its methodology is still evolving.
- A multimodal approach sets out road use priority for each part of the network.
- Research suggests network operation planning is closely related to integrated transport and land use planning as well as transport mode/theme-specific planning documents.



2. Functional road classification

See Section 2.2

Austroads



3. Well-connected transport network infrastructure

See Section 2.3

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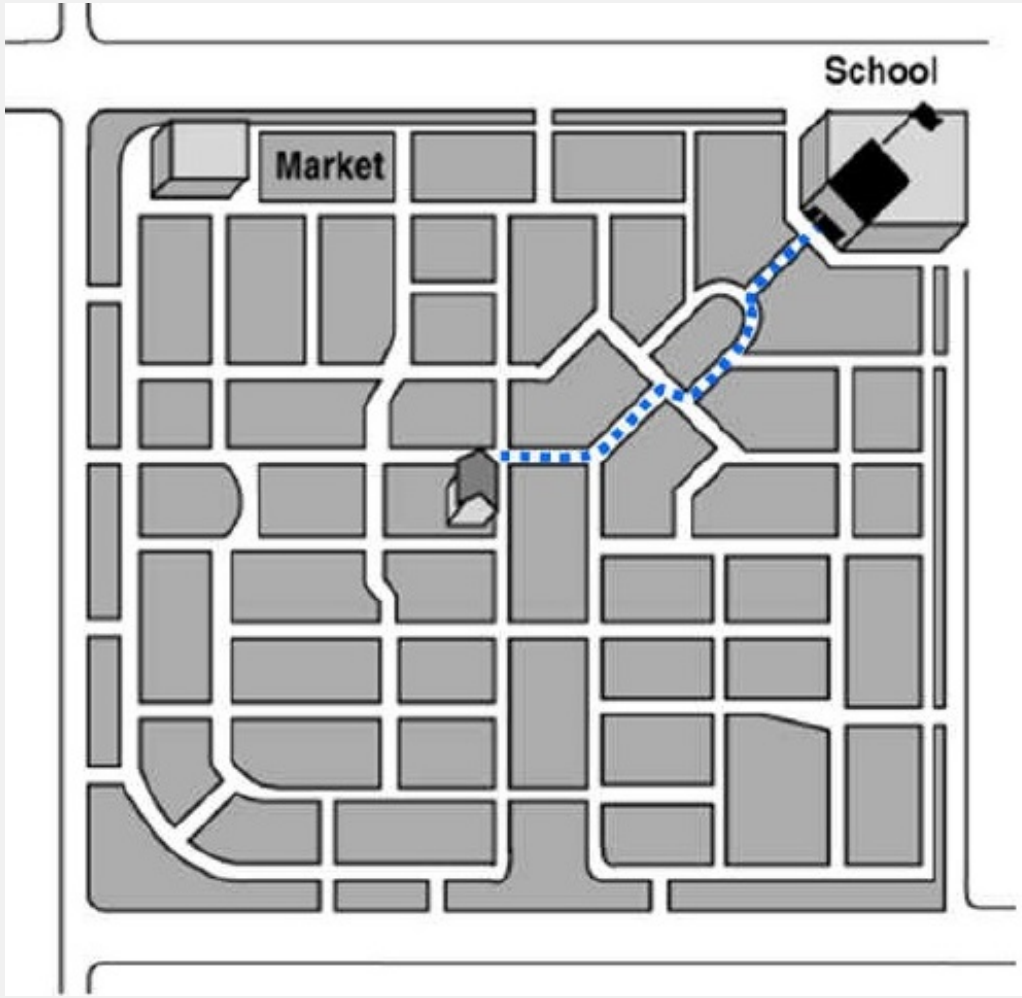

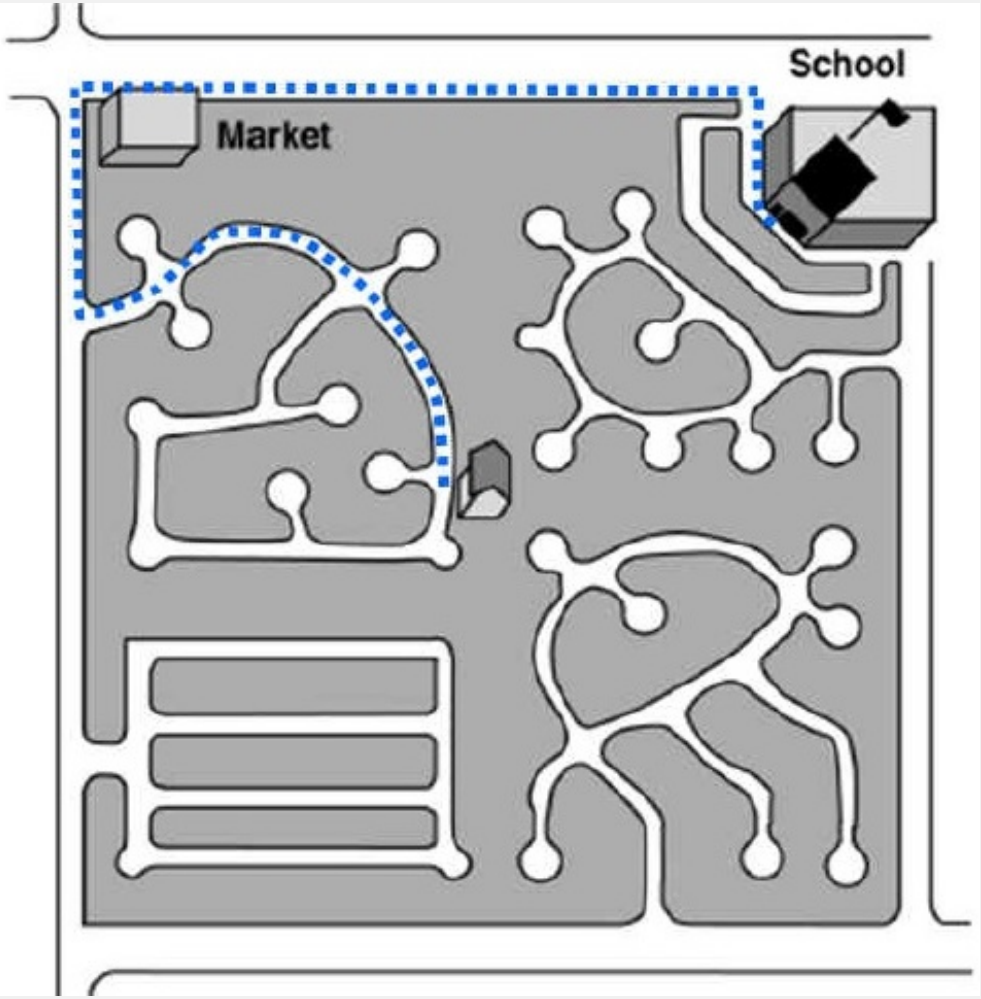

4. Traffic control devices and techniques

See Section 2.4

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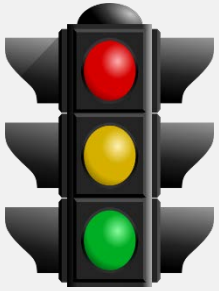
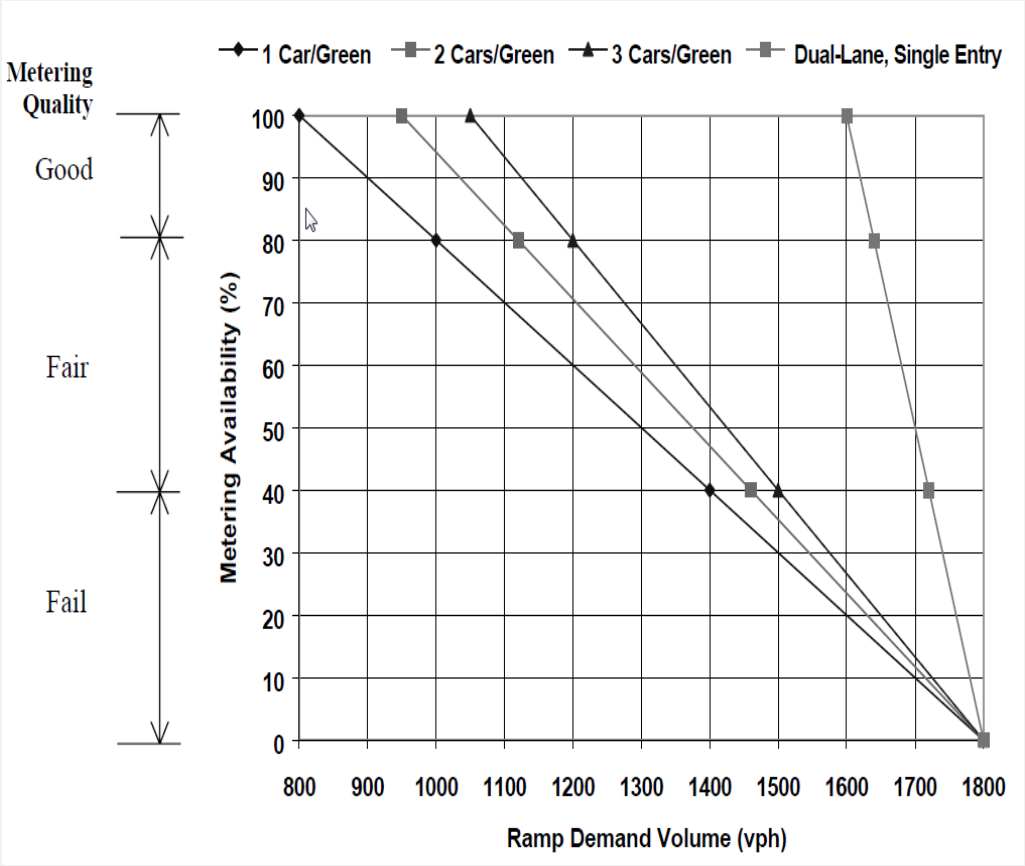
Road signs and symbols

Traffic signals



Application of ITS



Ramp metering

5. Traffic calming and local area traffic management

See Section 2.5

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- Reduce speed via traffic-calming devices
- Examples:
  - Speed humps, speed cushions
  - Slow points
  - Lane narrowing/kerb extensions
  - Roundabouts
  - Driveway links
- Several traffic-calming-related techniques are available
  - Shared zone
  - Self-explaining roads
  - Context-sensitive design
  - .....

6. Traffic incident management

See Section 2.6

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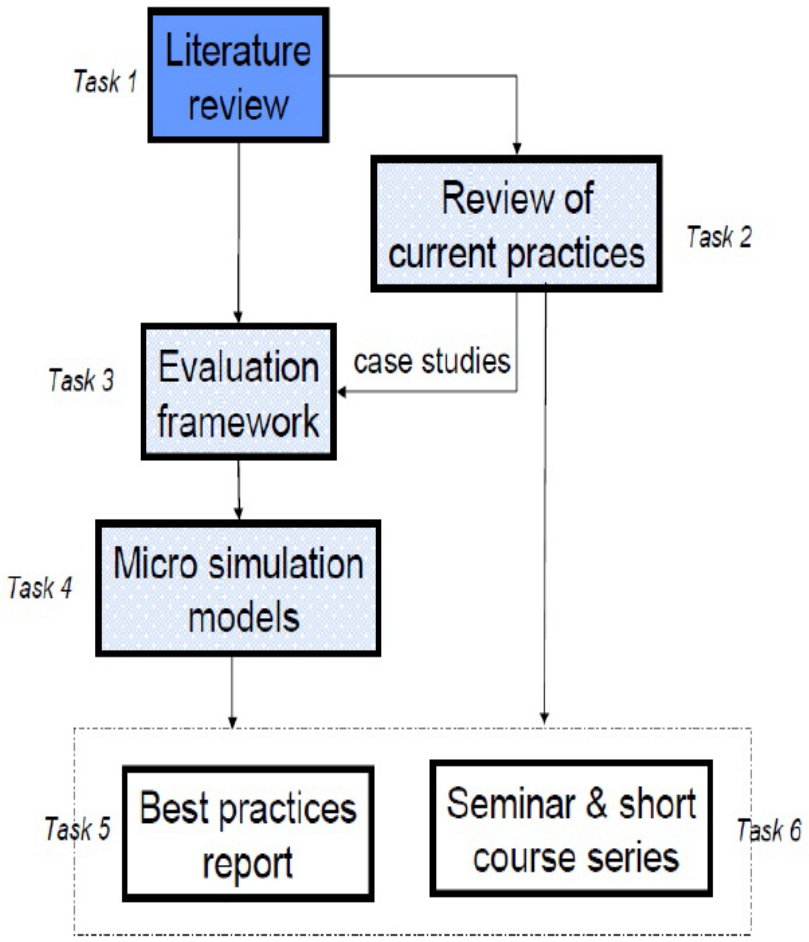
Figure A 1: Six tasks in Austroads Project NS1017



Goal Normal traffic restored quickly and safely

Objective To provide a quick, effective and coordinated incident response to safely restore normal traffic flow

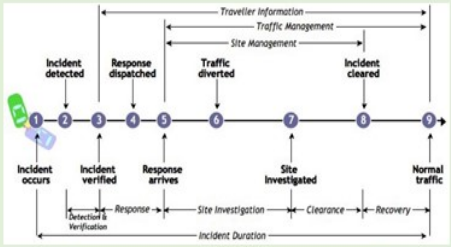
Principles

- Inter-jurisdictional and interagency collaboration
- Modular structure with a common language
- Multi-stage incident response planning
- Prioritisation of TIM initiatives for value for money
- Quick clearance policy
- Technological adaptation at various TIM stages
- Feedback, evaluation and continuous improvement

Integrated Process for Traffic Incident Management (IPTIM)

Multiagency Collaboration

Planning for TIM



Traffic Incident Management

Performance Evaluation

Capability Development

Traffic Incident Management Techniques

- Formal agreements
- Multi-agency teams
- Incident command system

- TIM as a key priority in each responder agency
- Stakeholder involvement with clear understanding of roles and priorities

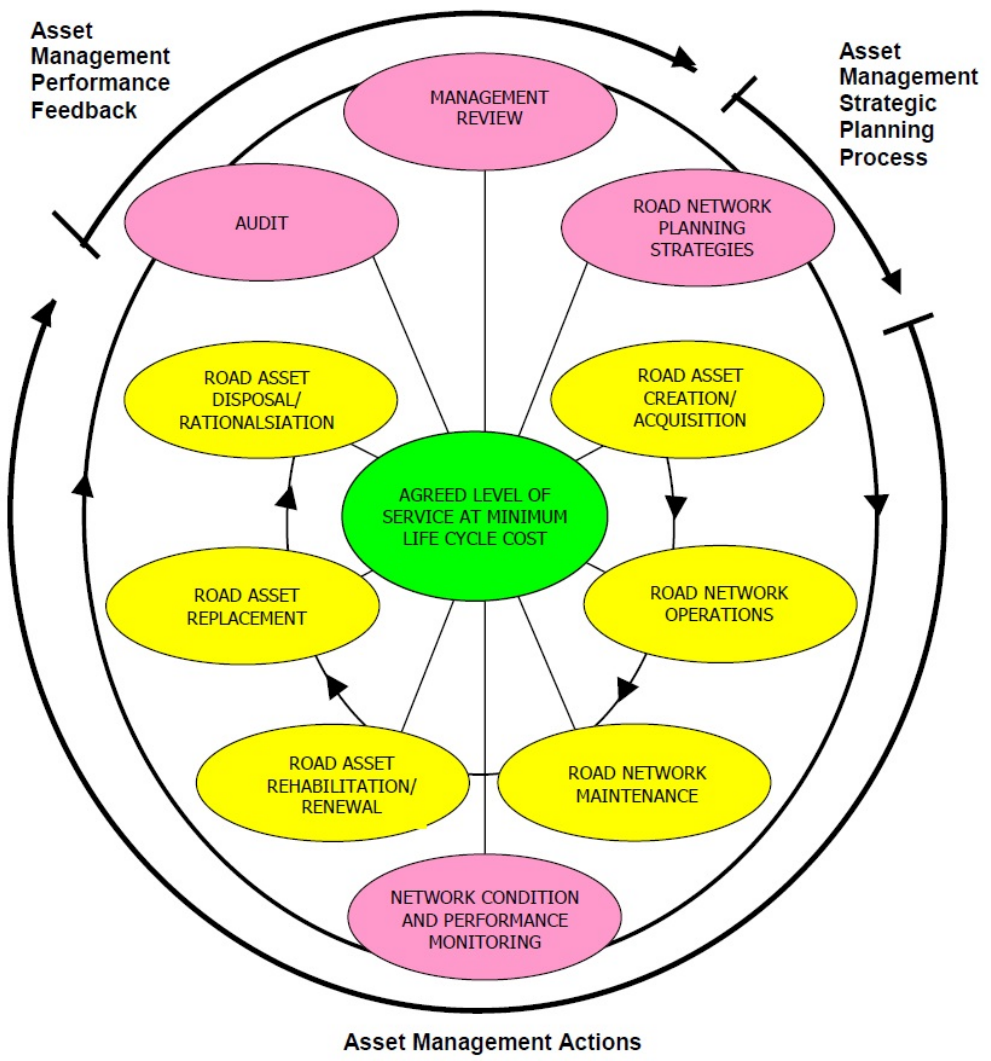
- Incident response units and patrols
- CCTV and roadside emergency phone
- In and over road sensors (e.g. loop and radar)
- Automatic Incident Detection
- Vehicle-based information report (e.g. eCall)
- Smartphones and GNSS
- C-ITS and DSRC (e.g. Bluetooth)
- Social media and crowdsourcing
- Aerial traffic monitoring (e.g. drone)

- Performance measure setup
- Evaluation of TIM projects
- Review of current TIM practice

- Responder education and training
- Reference library and register of professionals and experts

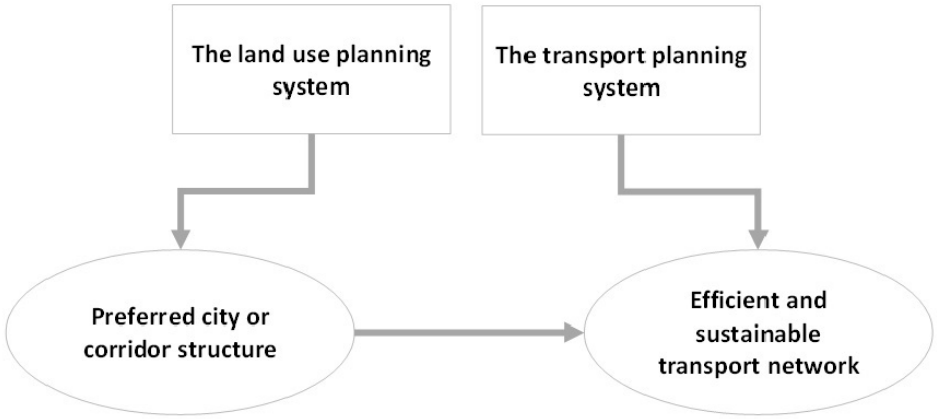
7. Lifecycle asset management

See Section 2.7

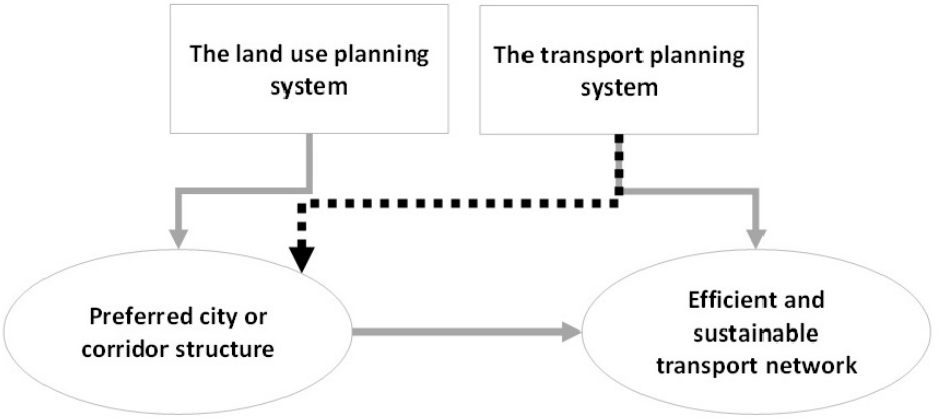


8. Integrated transport and land use planning

See Section 2.8



(a) Traditional approach - cluster & connect



(b) Emerging approach - city shaping impact of strategic infrastructure

9. Parking strategy and management

See Section 2.9

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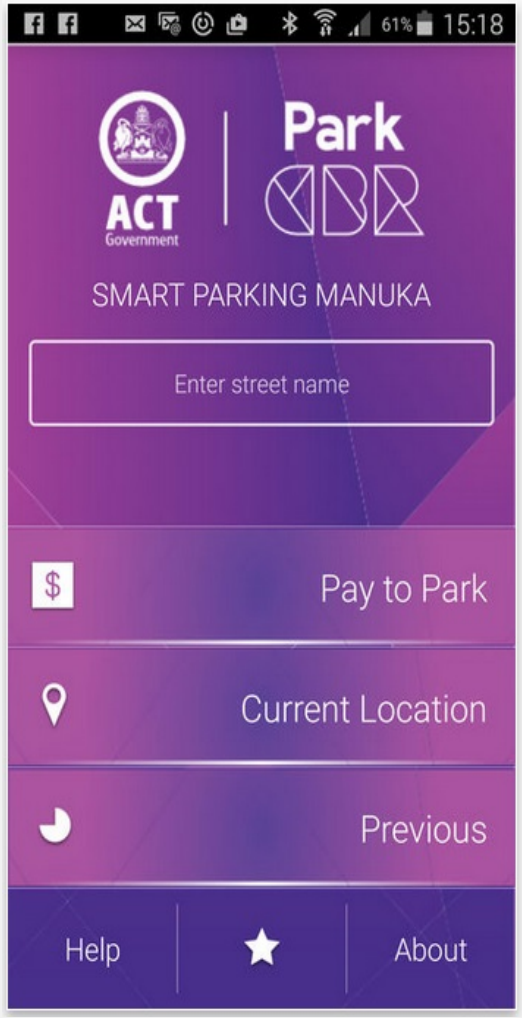

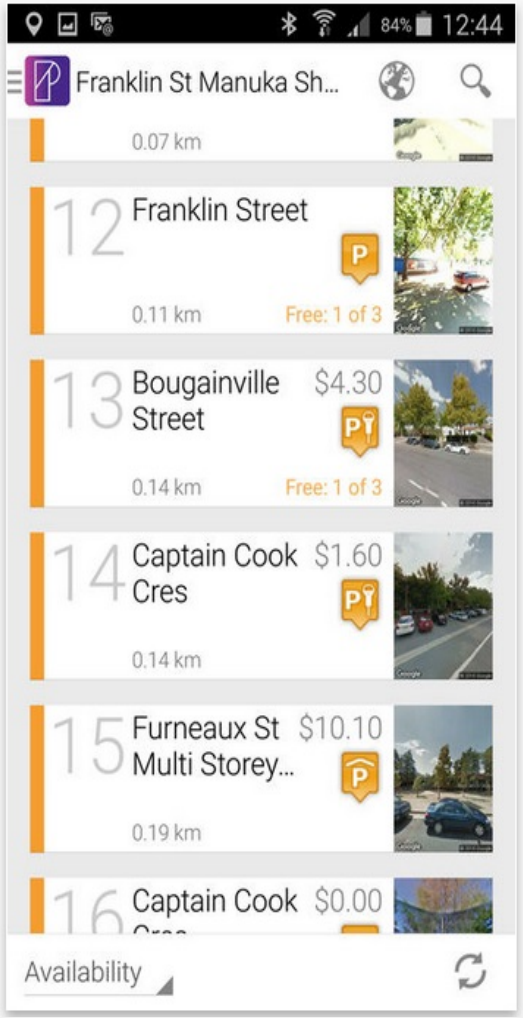

10. Travel demand management

See Section 2.10

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- Objectives of TDM
  - performance-based (e.g. environmental, economic, social)
  - purpose-based (e.g. administrative, incentive-based, educational)
- Different types of TDM actions can be undertaken
  - How?
  - Where?
- TDM actions should be considered at different levels of road transport system planning
  - local level (e.g. CBD or metropolitan activity centre)
  - Region level (e.g. in a congested region such as an inner metropolitan region)
  - City-wide or national initiative

11. Safe System approach and principles

See Section 2.11

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12. Electric, connected, autonomous vehicles

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See Section 2.12

13. Transport sustainability and resilience

See Section 2.13

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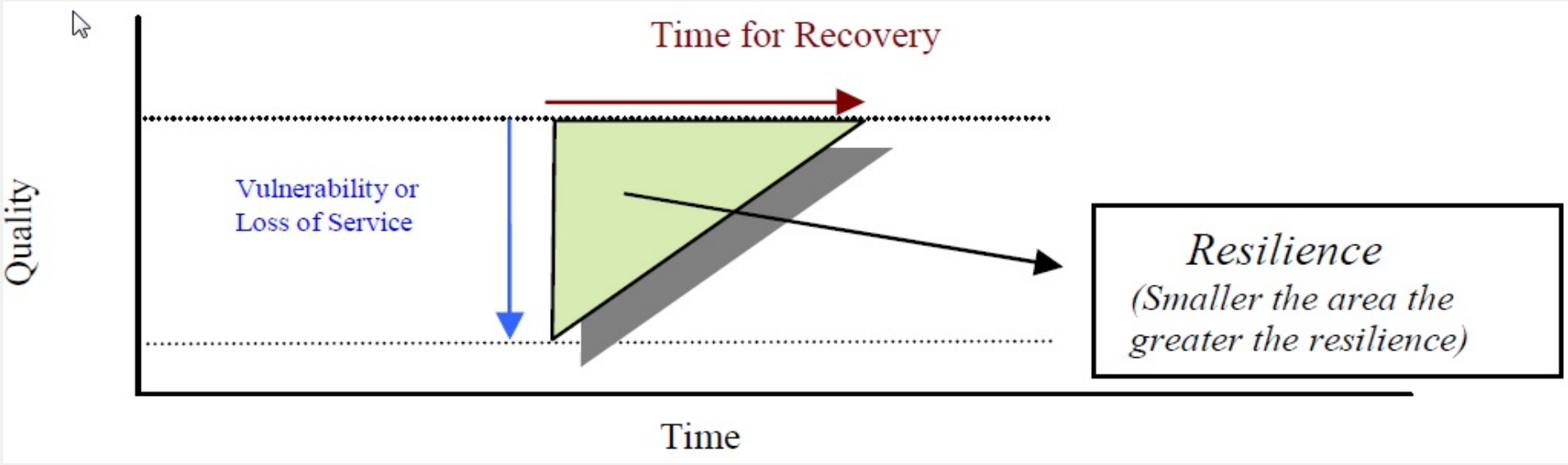
Economic	Social	Environmental
Traffic congestion	Inequity of impacts	Air pollution
Mobility barriers	Mobility disadvantaged	Climate change
Crash damages	Human health impacts	Habitat loss
Transportation facility costs	Community cohesion	Water pollution
Consumer transportation costs	Community livability	Hydrologic impacts
Depletion of non-renewable resources	Aesthetics	Noise pollution



14. Human factors and road user behaviour

See Section 2.14

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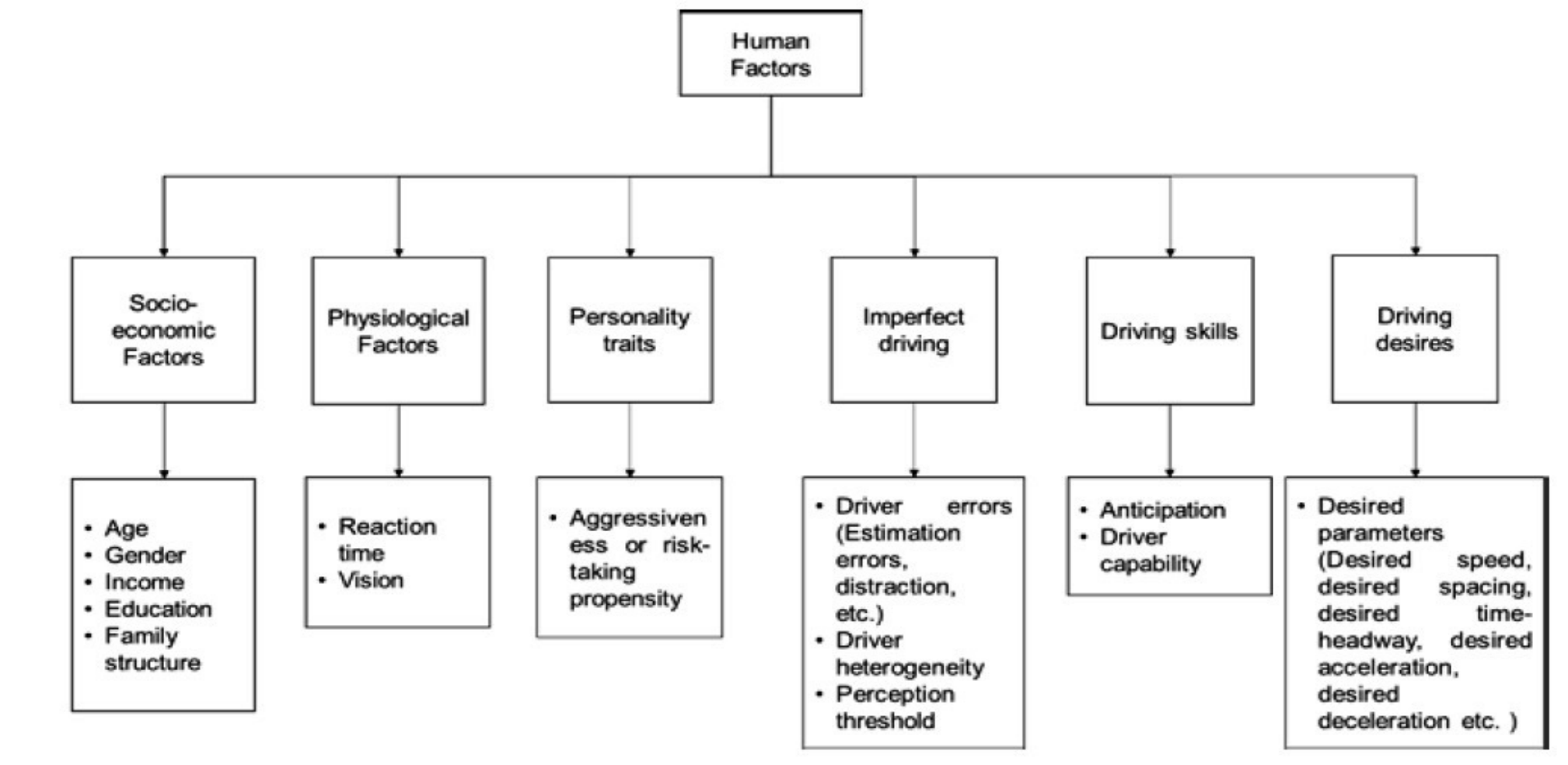

15. Stakeholder collaboration and engagement

See Section 2.15

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Current RTM Practices in Australasia

Dr Aut Karndacharuk

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Methodology

See Section 3

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Two methods to understand RTM practice in Australia and New Zealand

1. Review of local practice documents
2. Stakeholder consultation survey
   a) Survey questionnaire
   b) Follow-up interviews

Process for local practice review

See Appendix A

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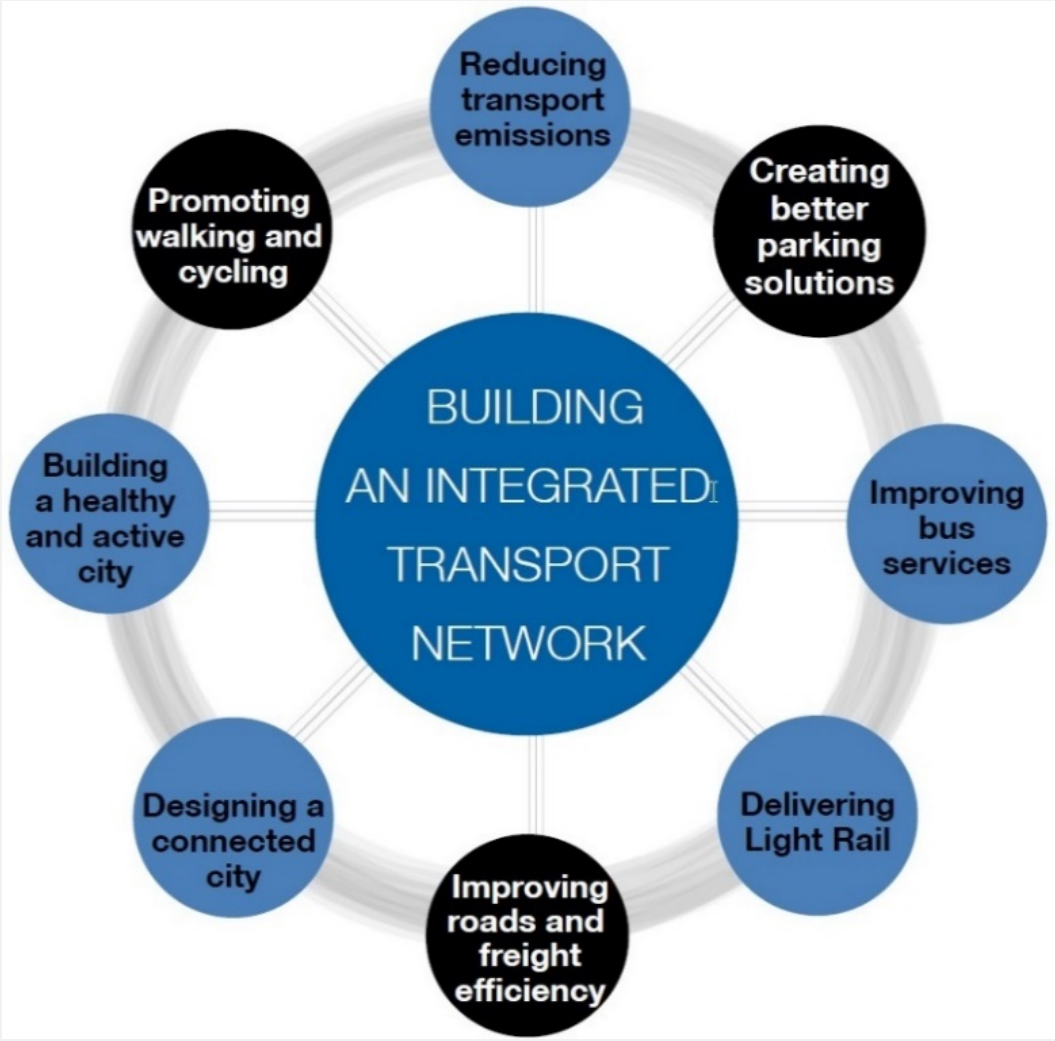
Jurisdiction	Organisation
ACT	Transport Canberra
	Environment, Planning and Sustainable Development Directorate – Planning
	Justice and Community Safety Directorate
NSW	Roads and Maritimes Service
	Transport for New South Wales
	Department of Planning and Environment
NT	Department of Infrastructure, Planning and Logistics
NZ	NZ Transport Agency
	Ministry of Transport
Qld	Queensland Department of Transport and Main Roads
SA	Department of Planning, Transport and Infrastructure
Tas	Department of State Growth
Vic	VicRoads
	Department of Economic Development, Jobs, Transport and Resources
WA	Main Roads Western Australia
	Department of Transport
	Department of Planning

- **Identify agencies** that are responsible for RTM
- **Search the website** for high-level document relating to RTM strategy, policy and plans
- **Use a search engine** to find specific documents (e.g. technical publications)
- **Review the documents** against the 15 literature review topics
- **Assess the documents** based on the five areas considerations (i.e. mobility, safety, assets, technology & environment, social and economic)

Road Transport Management practice: ACT

See Section 3.1



Elements within ACT's integrated road transport network

Road Transport Management practice: NSW

See Section 3.1

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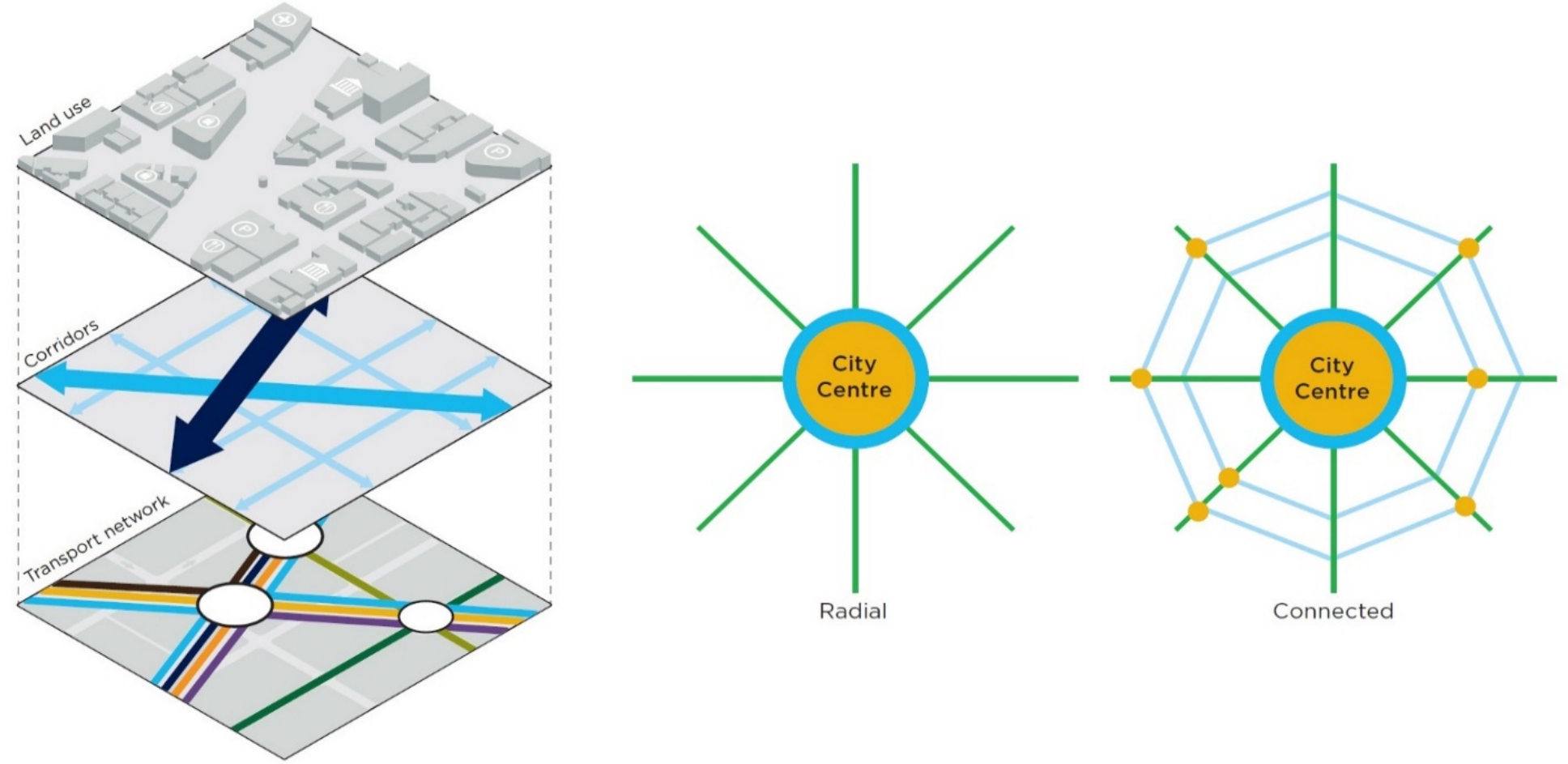

Transport and land use planning in NSW documentation

Road Transport Management practice: New Zealand

See Section 3.1

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The Government's four long-term goals for the transport system in New Zealand			
Effective	**Efficient**	**Resilient**	**Safe and responsible**
Moves people and freight where they need to go in a timely manner	Delivers the right infrastructure and services to the right level at the best cost	Meets future needs and endures shocks	Reduces the harms from transport
Examples of how ITS can contribute to the Government's long-term goals			
Real-time information provided by ITS systems improves the reliability of the network, reduces journey times and cost, and keeps users informed of the best mode of transport to use.	By offering new ways to manage demand for transport services, ITS helps us to use our existing infrastructure more efficiently. Detailed information on the use of transport systems or transport routes can remove or defer the need for future transport investments. More efficient use of vehicles will reduce fuel use.	ITS provides real-time information about the state of transport systems. This allows network operators to manage the network and keep users informed when shocks such as crashes and natural disasters occur.	ITS technologies have a major impact on the safety of transport by reducing the severity and number of crashes in all modes of transport. Some technologies can also reduce emissions by smoothing traffic flow, and improve the efficiency of supply chains by providing operators with real-time information on their driving efficiency.

The role of ITS technologies in relation to long-term goals for NZ transport system

Road Transport Management practice: Victoria

See Section 3.1

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Victorian Safe System approach

Observations

See Section 3.2

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Most jurisdictions practice all of the RTM topics identified. Some of the missing RTM principles are local in nature such as traffic calming (#5) and parking management (#9), which are primarily performed by local government.

Jurisdiction	RTM principle														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
ACT	✓	–	✓	✓	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓
NSW	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NT	✓	–	✓	✓	–	–	✓	✓	–	✓	✓	✓	✓	✓	✓
NZ	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Qld	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
SA	✓	✓	✓	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	✓
Tas.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Vic.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
WA	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Observations

See Section 3.2

- In many cases, the RTM principles are practised in multiple agencies within the jurisdiction. This demonstrates a broad scope and impact of the RTM knowledge.
- The RTM goal in most jurisdictions is largely consistent with that identified in this project that is to enable a **safe, efficient, reliable and sustainable** road transport system.
- Austroads Guides and publications were identified as the major sources of information for preparing policy and plans in road transport planning and management by a number of road transport agencies.

Stakeholder consultation survey

See Section 3.3

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Email Survey

- Request circulated to the PWG with survey questionnaire

Follow-up Interviews

- To better understand how and to what extent the RTM principles have been employed

Survey questionnaire

See Appendix B

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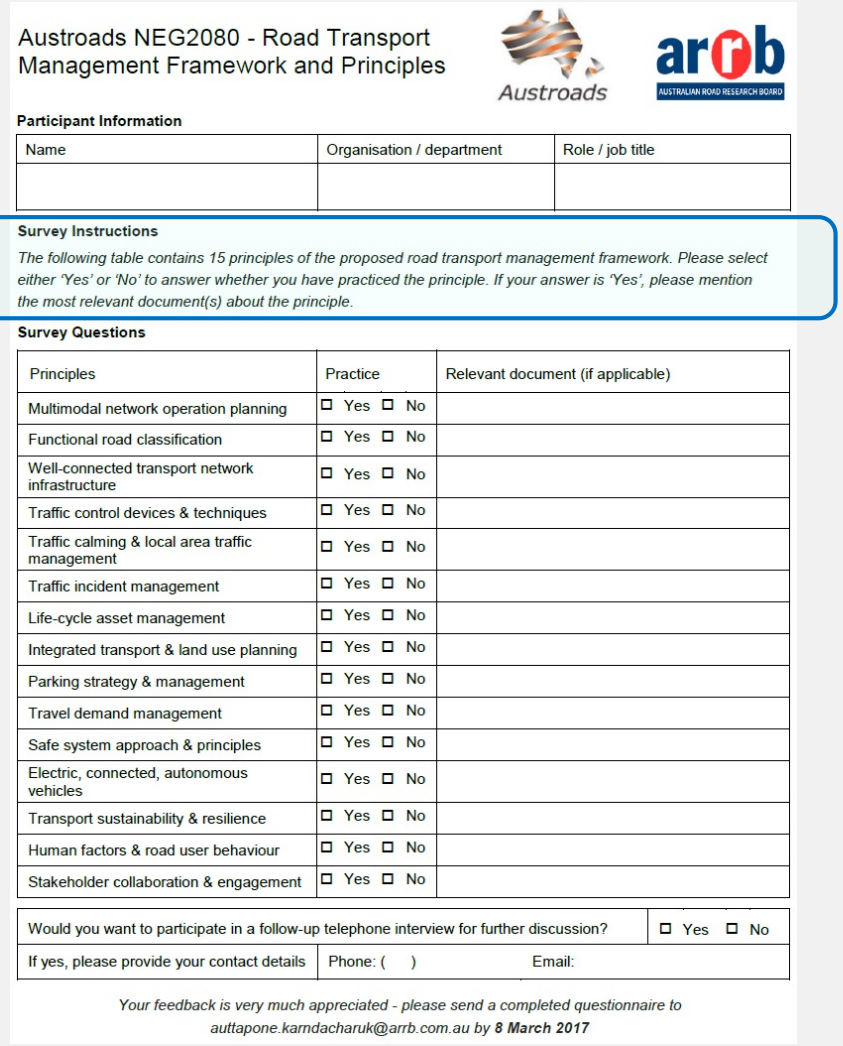

Austroads NEG2080 - Road Transport Management Framework and Principles

Austroads

arrb AUSTRALIAN ROAD RESEARCH BOARD

Participant Information

Name	Organisation / department	Role / job title

Survey Instructions

The following table contains 15 principles of the proposed road transport management framework. Please select either 'Yes' or 'No' to answer whether you have practiced the principle. If your answer is 'Yes', please mention the most relevant document(s) about the principle.

Survey Questions

Principles	Practice	Relevant document (if applicable)
Multimodal network operation planning	☐ Yes ☐ No	
Functional road classification	☐ Yes ☐ No	
Well-connected transport network infrastructure	☐ Yes ☐ No	
Traffic control devices & techniques	☐ Yes ☐ No	
Traffic calming & local area traffic management	☐ Yes ☐ No	
Traffic incident management	☐ Yes ☐ No	
Life-cycle asset management	☐ Yes ☐ No	
Integrated transport & land use planning	☐ Yes ☐ No	
Parking strategy & management	☐ Yes ☐ No	
Travel demand management	☐ Yes ☐ No	
Safe system approach & principles	☐ Yes ☐ No	
Electric, connected, autonomous vehicles	☐ Yes ☐ No	
Transport sustainability & resilience	☐ Yes ☐ No	
Human factors & road user behaviour	☐ Yes ☐ No	
Stakeholder collaboration & engagement	☐ Yes ☐ No	

Would you want to participate in a follow-up telephone interview for further discussion?		☐ Yes ☐ No
If yes, please provide your contact details	Phone: ( )	Email:

*Your feedback is very much appreciated - please send a completed questionnaire to auttapone.karndacharuk@arrb.com.au by **8 March 2017***

Survey Instructions

The following table contains 15 principles of the proposed road transport management framework. Please select either ‘Yes’ or ‘No’ to answer whether you have practiced the principle. If your answer is ‘Yes’, please mention the most relevant document(s) about the principle.

Survey responses

See Section 3.4

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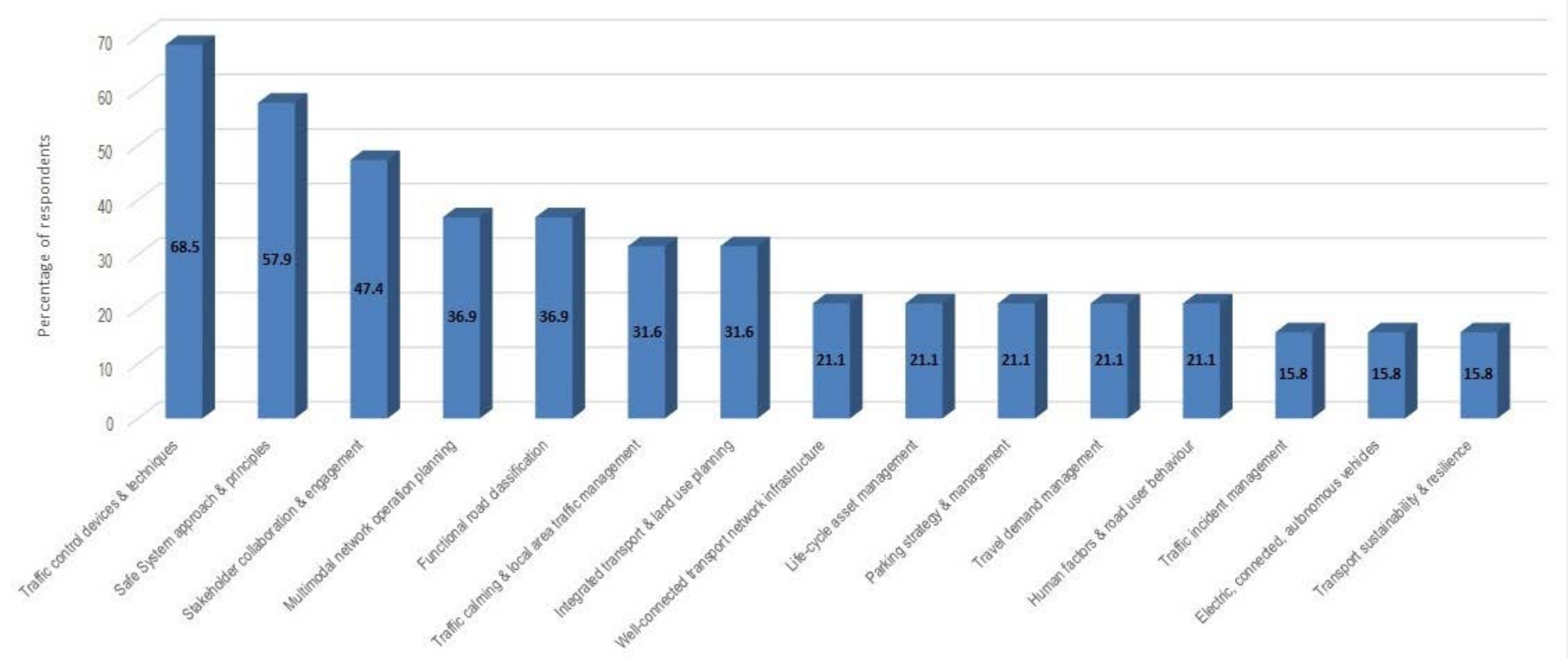

Interview responses

See Section 3.4

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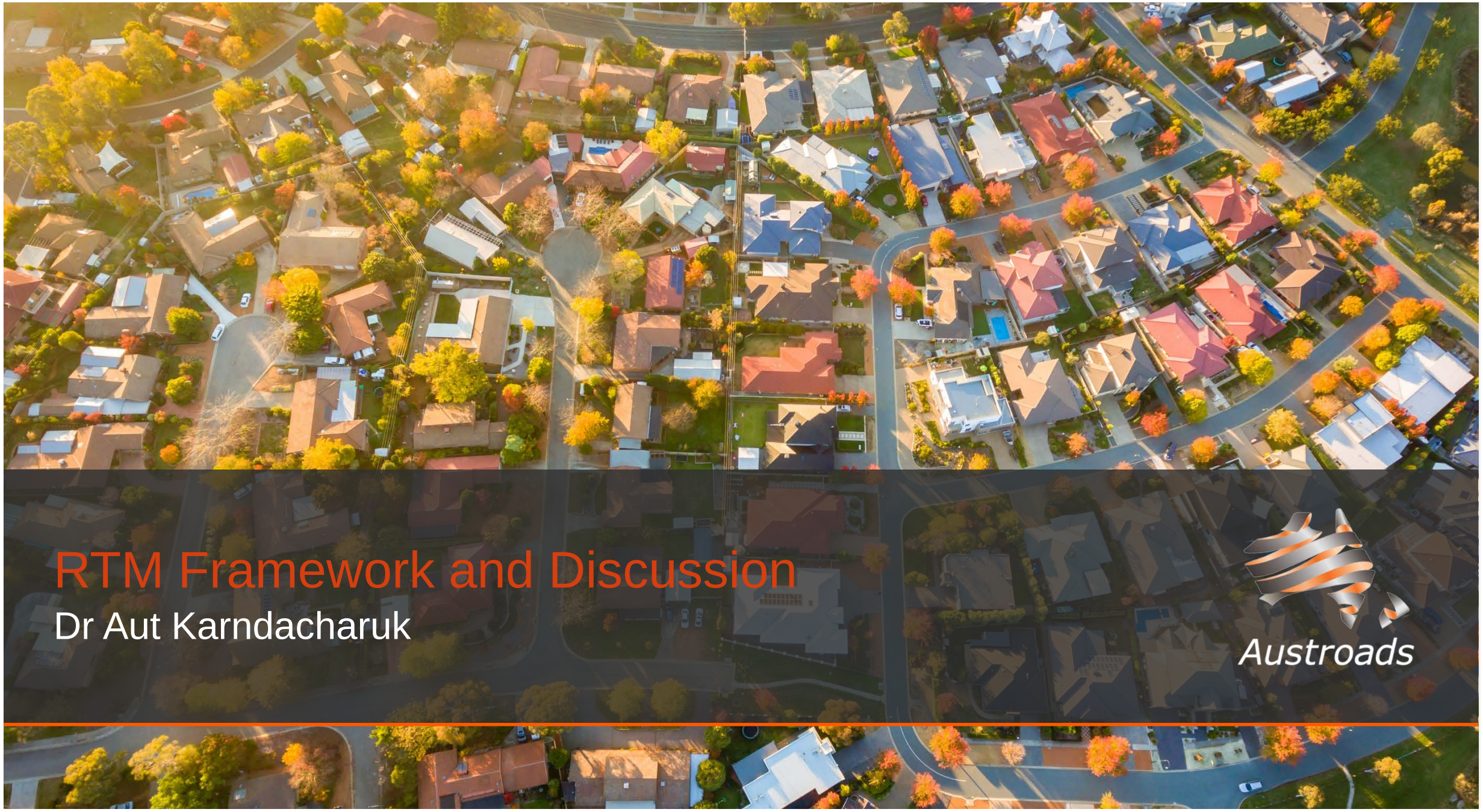
Principle		Interviewee					
		A	B	C	D	E	F
1	Multimodal network operation planning	✓	–	–	–	✓	–
2	Functional road classification	✓	–	✓	–	✓	–
3	Well-connected transport network infrastructure	–	–	–	–	✓	–
4	Traffic control devices & techniques	–	–	✓	✓	✓	✓
5	Traffic calming & local area traffic management	–	–	✓	–	✓	✓
6	Traffic incident management	✓	–	–	–	✓	–
7	Lifecycle asset management	✓	–	–	–	–	–
8	Integrated transport & land use planning	–	–	–	–	✓	✓
9	Parking strategy & management	–	–	✓	–	✓	✓
10	Travel demand management	–	–	✓	–	✓	–
11	Safe System approach & principles	–	–	✓	–	✓	✓
12	Electric, connected, autonomous vehicles	–	✓	–	–	✓	–
13	Transport sustainability & resilience	–	–	–	–	✓	–
14	Human factors & road user behaviour	–	–	✓	–	✓	–
15	Stakeholder collaboration & engagement	✓	–	✓	–	✓	✓

Observations

- Interconnectivity
- Multifaceted nature
- Level of practice



RTM Framework and Discussion

Dr Aut Karndacharuk

Austroads

Road Transport Management Framework

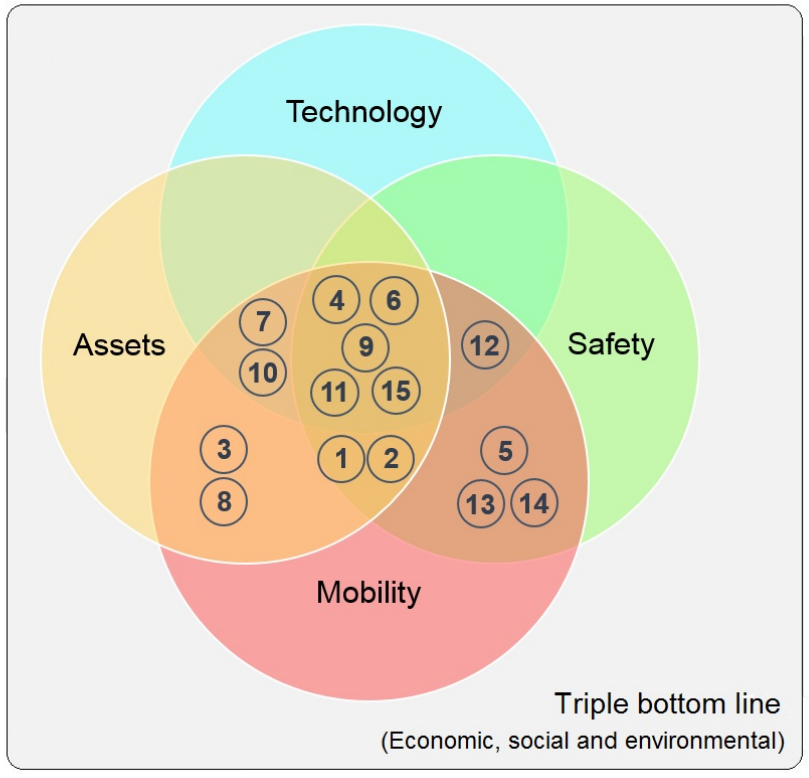
Goal A safe, efficient, reliable and sustainable road transport system

Objective To present the interconnectivity of multifaceted approaches in road transport management (RTM) to achieve the goal of enabling a safe, efficient, reliable and sustainable transport system

RTM Principles

1. Multi-modal network operations planning
2. Functional road classification
3. Well-connected transport network infrastructure
4. Traffic control devices and techniques
5. Traffic calming and local area traffic management
6. Traffic incident management
7. Lifecycle asset management
8. Integrated transport and land use planning
9. Parking strategy and management
10. Travel demand management
11. Safe System approach and principles
12. Electric, connected, autonomous vehicles
13. Transport sustainability and resilience
14. Human factors and road user behaviour
15. Stakeholder collaboration and engagement

RTM Landscape



Road Transport Management landscape

See Section 4.2

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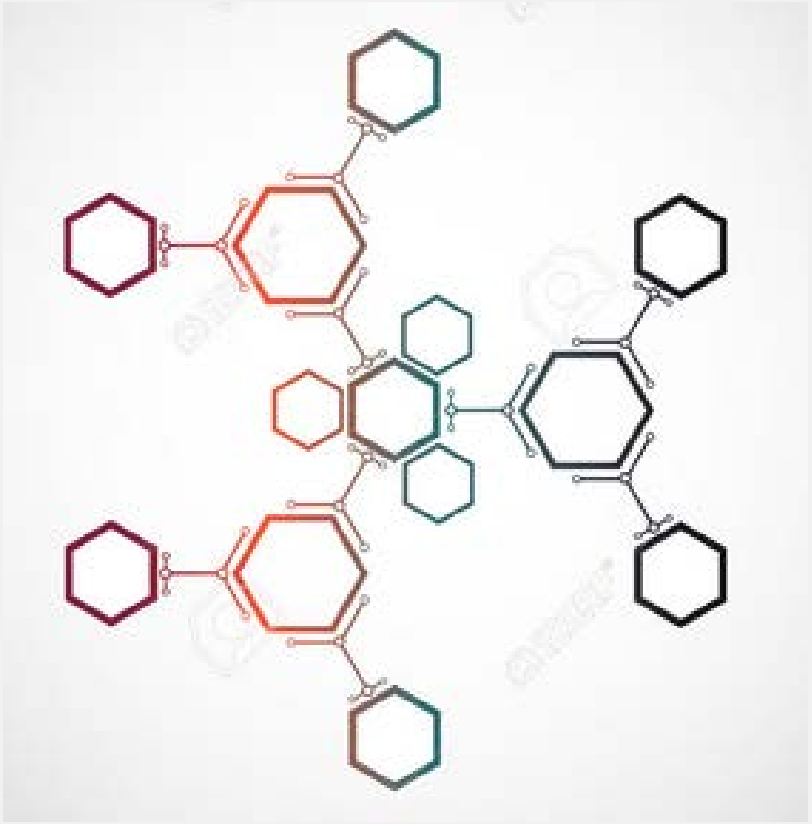
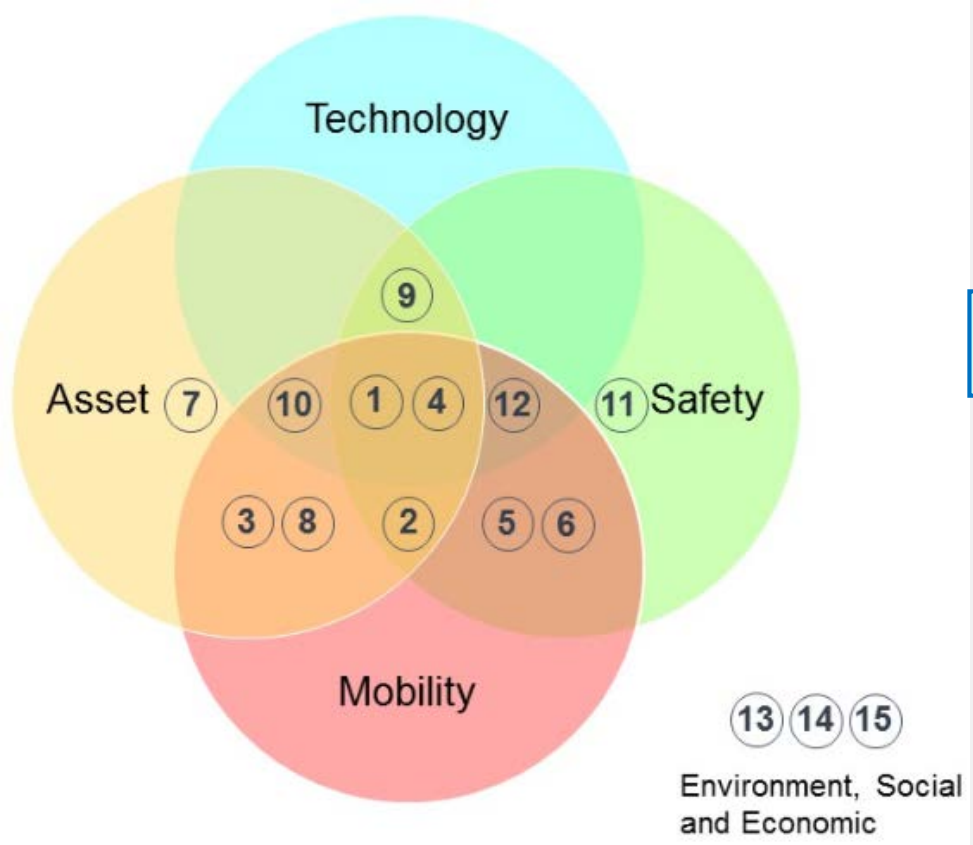
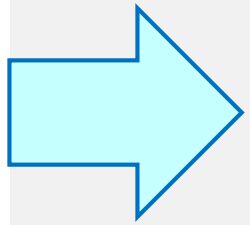
Five connected areas of consideration

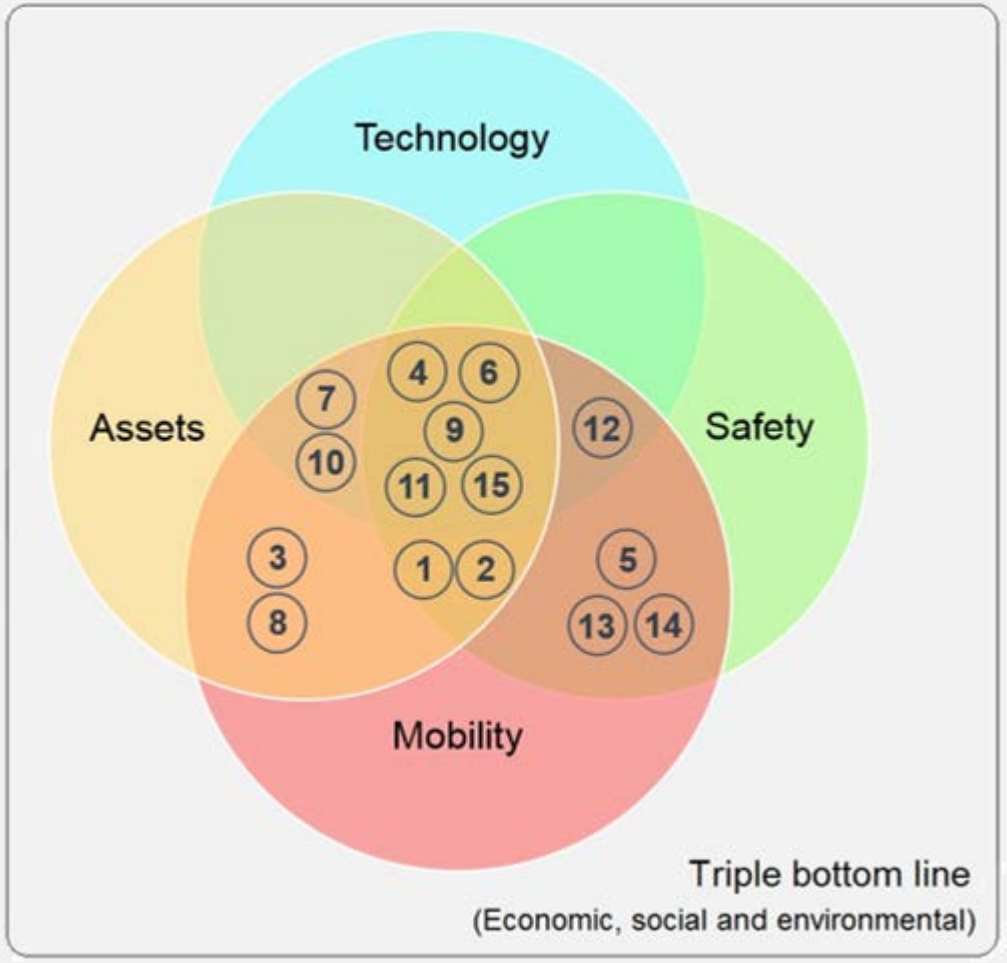
- Mobility
- Safety
- Assets
- Technology
- Triple bottom line (economic, social and environmental aspects)



Road Transport Management landscape as a collective view







Pre-workshop with Project Working Group

Discussion of Road Transport Management landscape

See Section 4.4.1

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- Implication of technological advancement of ECAVs (principle 12)
- Digital connectivity for intelligent mobility (principle 3)
- Reorganisation of road classification and asset management (principles 2 & 7)
- Provision of automated vehicles in integrated land use & transport planning (principle 8)
- Evolution of parking strategy and management (principle 9)
- Human factors consideration in a transition to full automation (principle 14)

Road Transport Management in integrated system planning

See Section 4.4.2

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Level of planning	RTM principle														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
City, region, and jurisdiction	✓	✓	✓	✓	✓	✓	✓	★	✓	★	✓	✓	★	✓	✓
Network	★	★	★	✓	✓	✓	★	✓	✓	✓	✓	✓	✓	✓	✓
Corridor and area	✓	✓	✓	✓	★	★	✓	✓	★	✓	✓	✓	✓	✓	✓
Route	✓	✓	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Link and node	–	–	–	✓	✓	–	–	✓	–	–	✓	–	–	✓	✓

★	HIGH RELEVANCE
✓	SOME RELEVANCE
–	NO RELEVANCE

Road Transport Management in infrastructure life cycle

See Section 4.4.3

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Development stage	RTM principle														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Strategic transport planning	✓	✓	✓	✓	✓	✓	✓	★	✓	✓	✓	✓	★	✓	✓
System and solution planning	✓	★	★	✓	★	✓	✓	✓	★	★	★	✓	✓	★	★
Design and construction	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Operation and maintenance	★	✓	✓	★	✓	★	✓	✓	✓	✓	✓	✓	✓	✓	✓

★	HIGH RELEVANCE
✓	SOME RELEVANCE
–	NO RELEVANCE

Questions?

Dr Aut Karndacharuk
Senior Research Engineer
Australian Road Research Board (ARRB)
P: +64 2 9282 4405
E: auttapone.karndacharuk@arrb.com.au

Asif Hassan
Professional Engineer
Australian Road Research Board (ARRB)
P: +64 2 9282 4413
E: asif.hassan@arrb.com.au

Upcoming Austroads webinars

Topic	Date
Intersections: • Guide to Traffic Management Part 6 • Guide to Road Design Part 4 and 4A	6 November
Road Safety Environment: Guide to Traffic Management Part 13	16 November
Current Practice and Developments in Concept of Operations	21 November
Traffic Studies and Analysis: Guide to Traffic Management Part 3	30 November

Register at http://www.austroads.com.au/event

Thank you for participating