Safe System Infrastructure on Mixed Use Arterials

8 February 2018

Austroads

Today’s moderator

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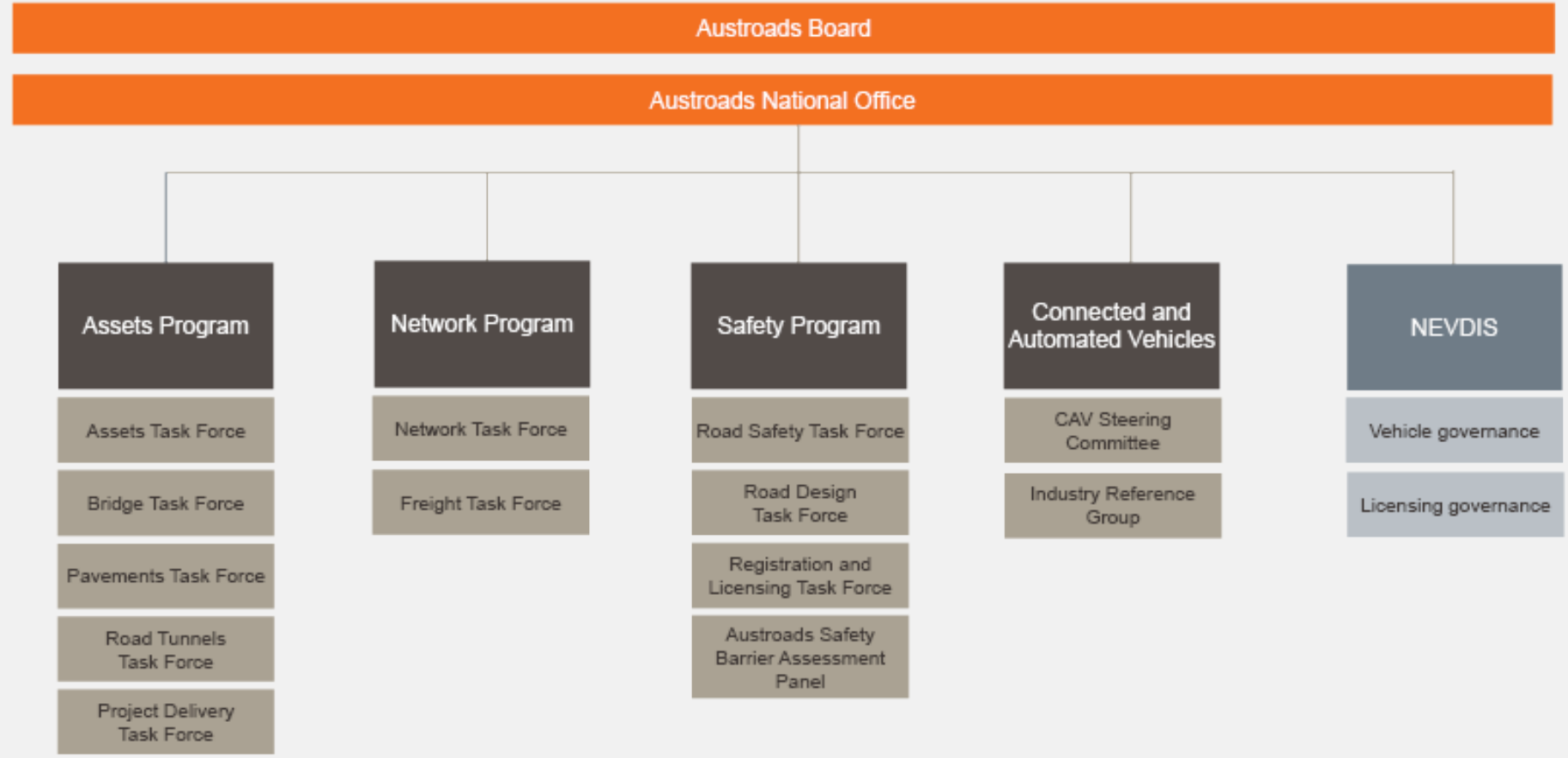
About Austroads

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

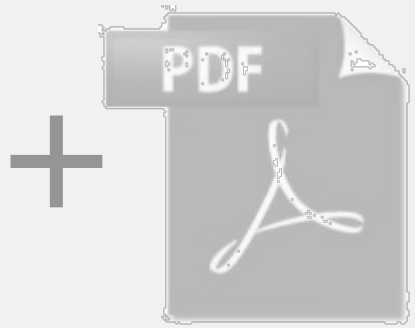
Our structure

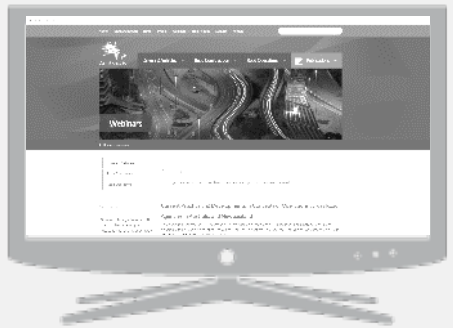


Housekeeping

Presentation = 35 mins

Question time = 15 mins





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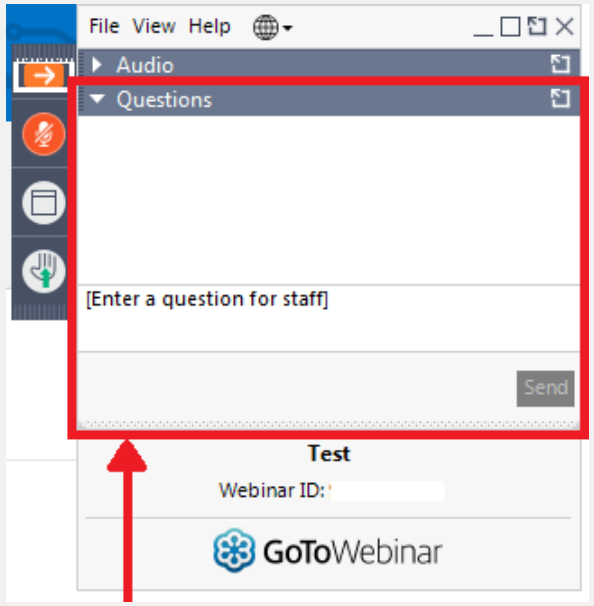

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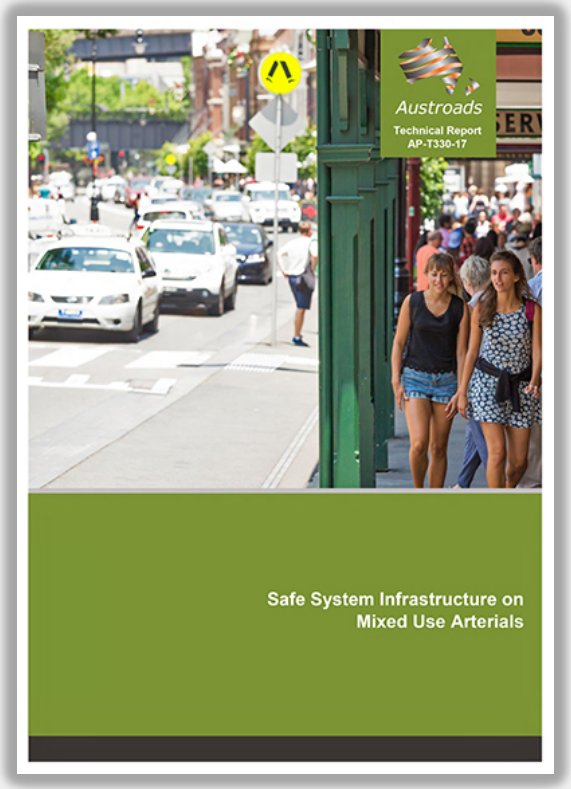

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Today’s presenters

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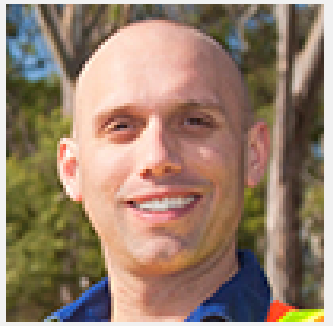

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Agenda

Topic	Presenter
Introduction and Project Background	Kenn Beer
Project Approach	Dr Blair Turner
Report Overview • Using the Report • Safe System Assessment Framework	Kenn Beer
Key Outcomes	Dr Blair Turner
Road Safety Solutions	Dr Blair Turner
Q&A	Both Presenters

Introduction and Project Background

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Introduction and background

See Section 1 and 3

- Urban arterials account for a high number of serious injuries
- Routes with mixed use function of high concern
- Competing demands in these locations
- A need to identify Safe System solutions
- Austroads funded study to address this issue

Introduction and background

See Section 1 and 3

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A reminder on the Safe System approach….

Key Principles:

- Aiming for no death or serious injury
- People make mistakes
- Shared responsibility
- People are vulnerable

Project Approach

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Introduction to team

Project Team

Austroads Project Manager
- Kenn Beer

Project Leader, ARRB
- Blair Turner

ARRB Team Members
- Paul Hillier
- Lisa Steinmetz
- Phuong Chau

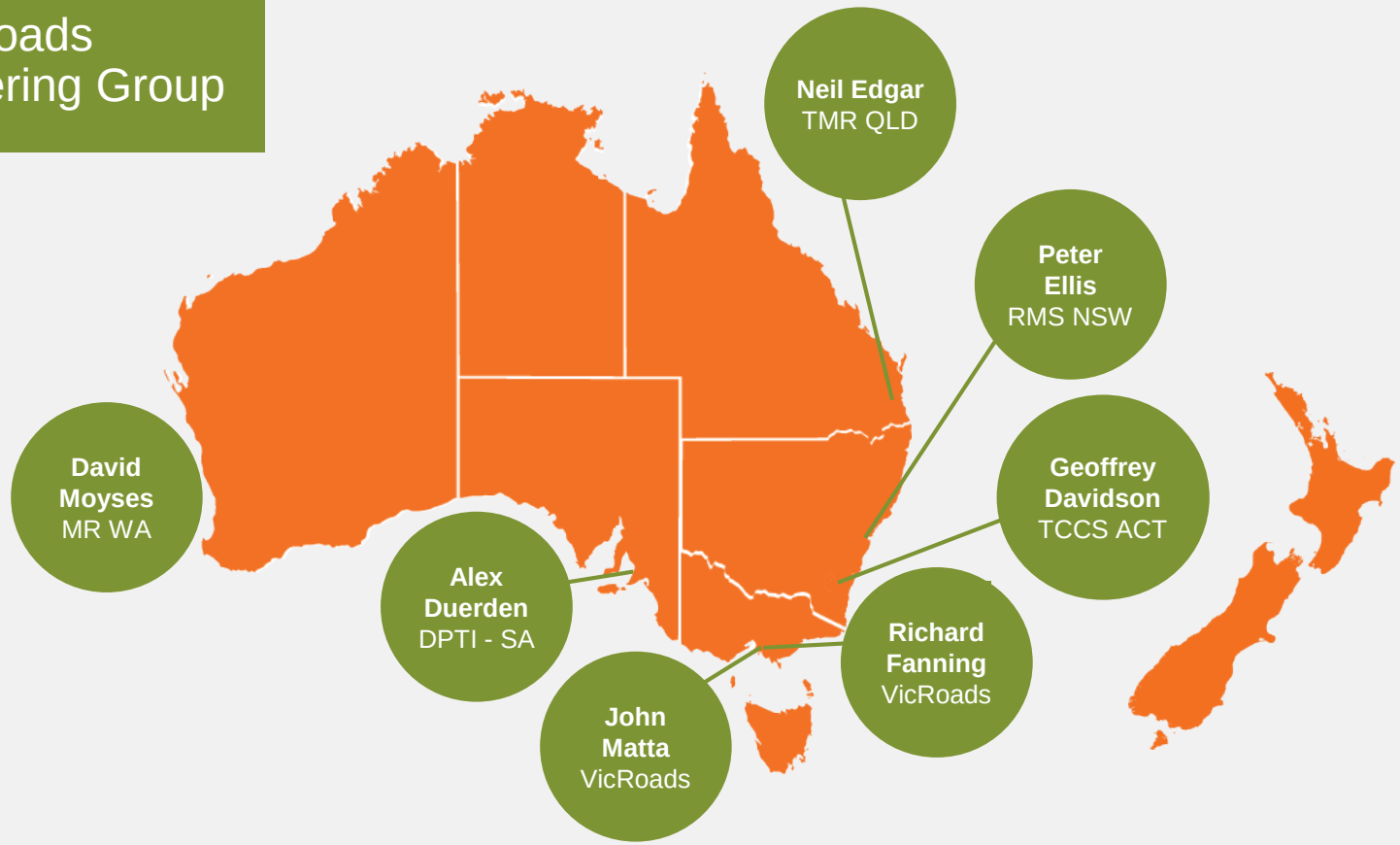
Team Members
- Rob Partridge, Shane Turner - Stantec
- Jeremy Woolley, Chris Stokes - CASR
- Jennifer Oxley, Karen Stephan - MUARC
- Bruce Corben - Corben Consulting

Review Team

- Austroads Project Steering Group
- Stakeholders- Road and Traffic Authorities
- Austroads Road Safety Task Force
- Austroads Road Design Task Force
- Austroads Board

The Project Team

Austroads
Project Steering Group



Method

See Section 3

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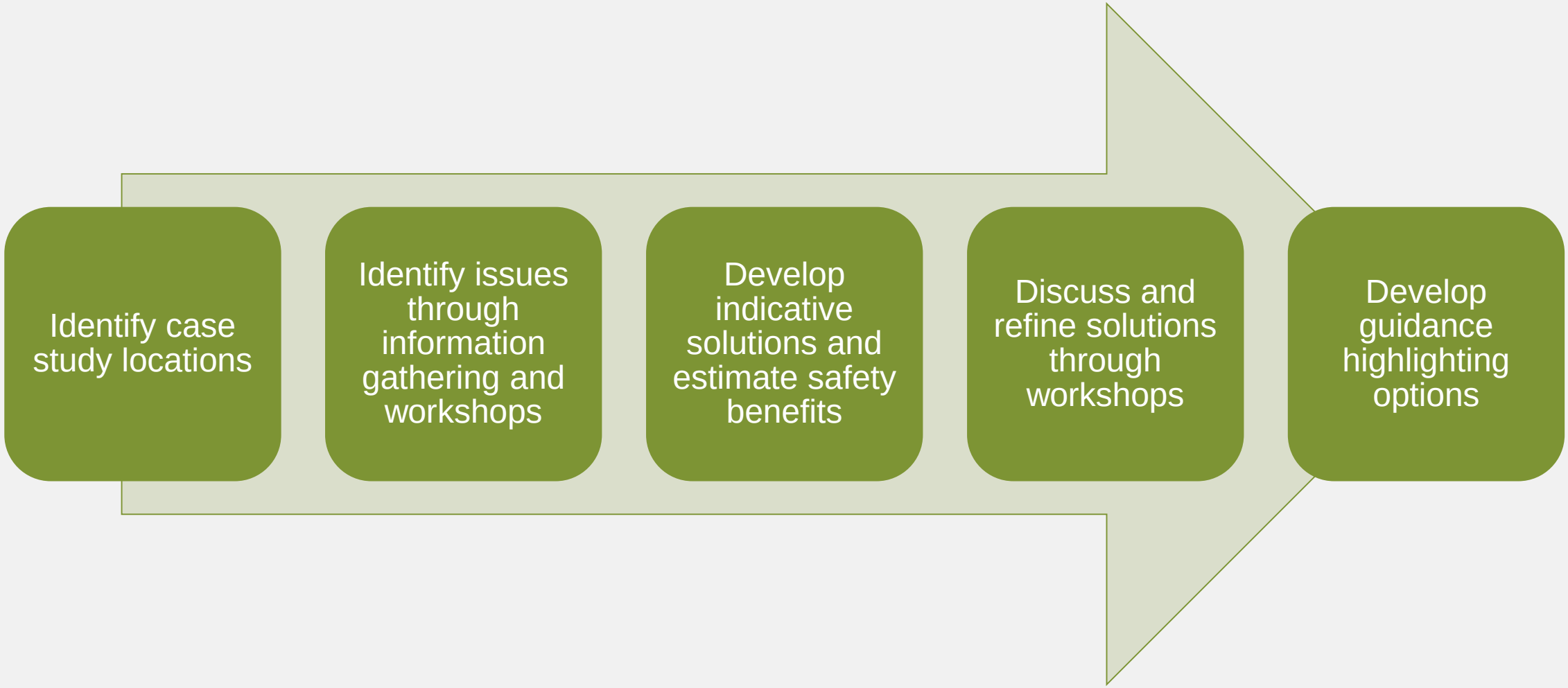

Report Overview

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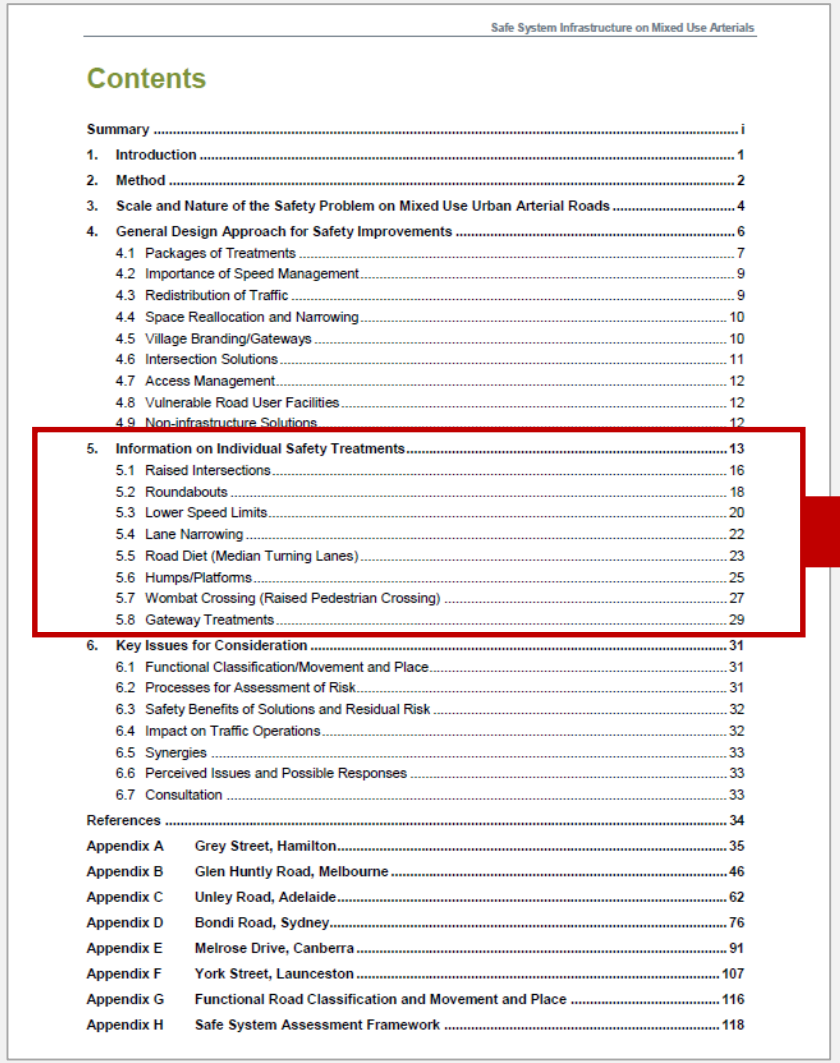
Report overview and using the report



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5. Information on Individual Safety Treatments

- 5.1 Raised Intersection
- 5.2 Roundabouts
- 5.3 Lower Speed Limits
- 5.4 Lane Narrowing
- 5.5 Road Diet (Median Turning Lanes)
- 5.6 Humps/Platforms
- 5.7 Wombat Crossing (Raised Pedestrian Crossing)
- 5.8 Gateway Treatments

5.1 Raised Intersections

Source: VicRoads.

Effectiveness

Crash reduction:

- 40% reduction in casualty crashes (CMF 0.60).

Speed reduction:

- 3 km/h reduction in mean speed.
- 8 km/h reduction in 85th percentile speed.

Cost: Medium to high
Treatment life: 20+ years

Description

Raised intersections (also known as platform intersections, raised junctions or plateaus) are a speed management device, typically with the aim of reducing the speed of vehicles to 50 km/h or less. The entire intersection can be raised, with the pavement surface sometimes flush with the adjoining footpath. Alternatively, raised sections can be placed in advance of the intersection (sometimes referred to as raised stop bars) in order to achieve a similar effect. Raised intersections can be painted or paved in a manner such that they serve to further increase driver awareness of the intersection.

Applicability

- Suggested that raised intersections and raised stop bars are not utilised on roads with posted speed limits of above 70 km/h.
- Should not be used where there is limited or restricted sight distance.

Road user effect/s (delays, congestion, consistency of travel time)

- 'Downgrading' of functionality of road – e.g. urban arterial potentially becomes a lesser road.
- Inconvenience and delay to buses and emergency vehicles, although this can be addressed through appropriate consultation and design.
- Increased noise levels.
- Pedestrians confusing ramp markings for crossing facilities.

Implementation issues

- Increased height and a steeper ramp gradient lead to a greater level of speed reduction. Austroads classifies a 1:30 gradient as bus friendly, but this flatter ramp may result in less speed reduction for other vehicles.
- Need to consider the impact on drainage.
- Require appropriate delineation.
- Traffic volume, composition and geometry should be taken into considerations when determining the suitability of this treatment.

Effectiveness

Cost

Treatment life

Description

Applicability

Road user effect/s (delays, congestion, consistency of travel time)

Implementation issues

Key references and sources

Key references and sources

Fortuijn, L, Garton, P & Peddes, B 2005, 'Safety impact of raised stop bars on distributor roads: draft', CROW, Ede, The Netherlands.

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Van der Dussen, P 2002, 'Verhoogde plateaus effectief en goedkoop bij terugdringen aantal ongevallen', [in Dutch Raised plateaus effective and cheap in reducing number of crashes], Wegen, vol. 76, no. 8, pp. 18-20.

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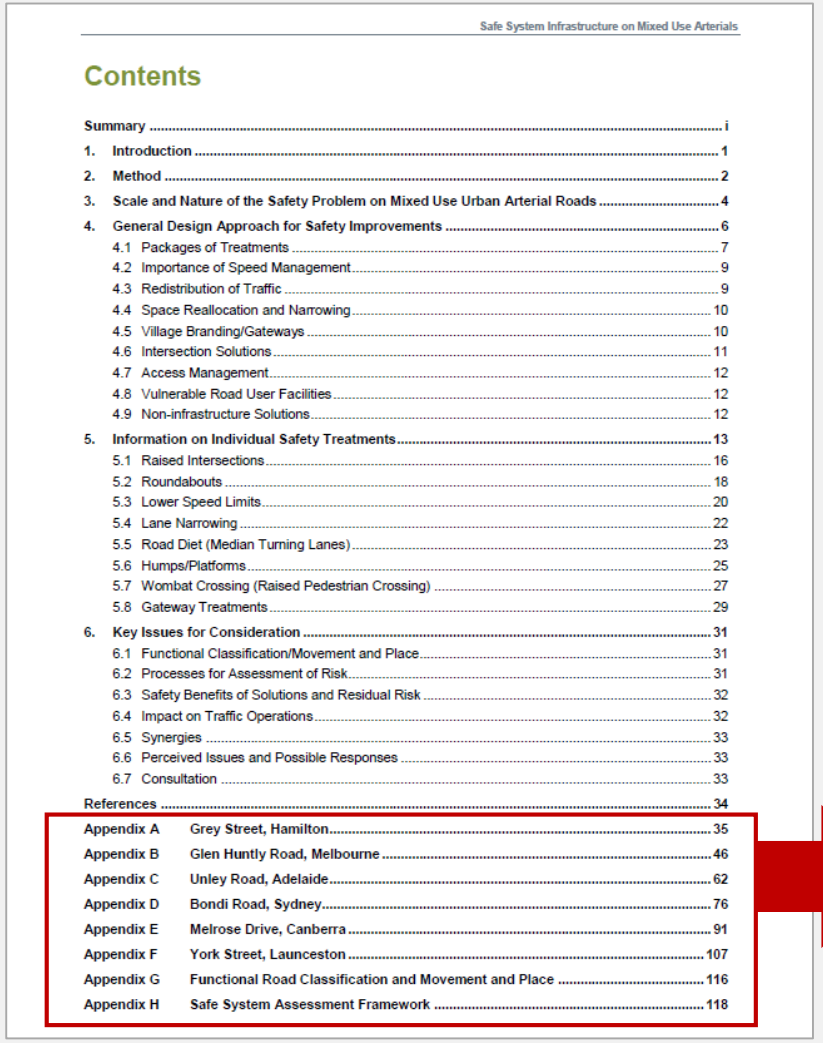
Report overview and using the report



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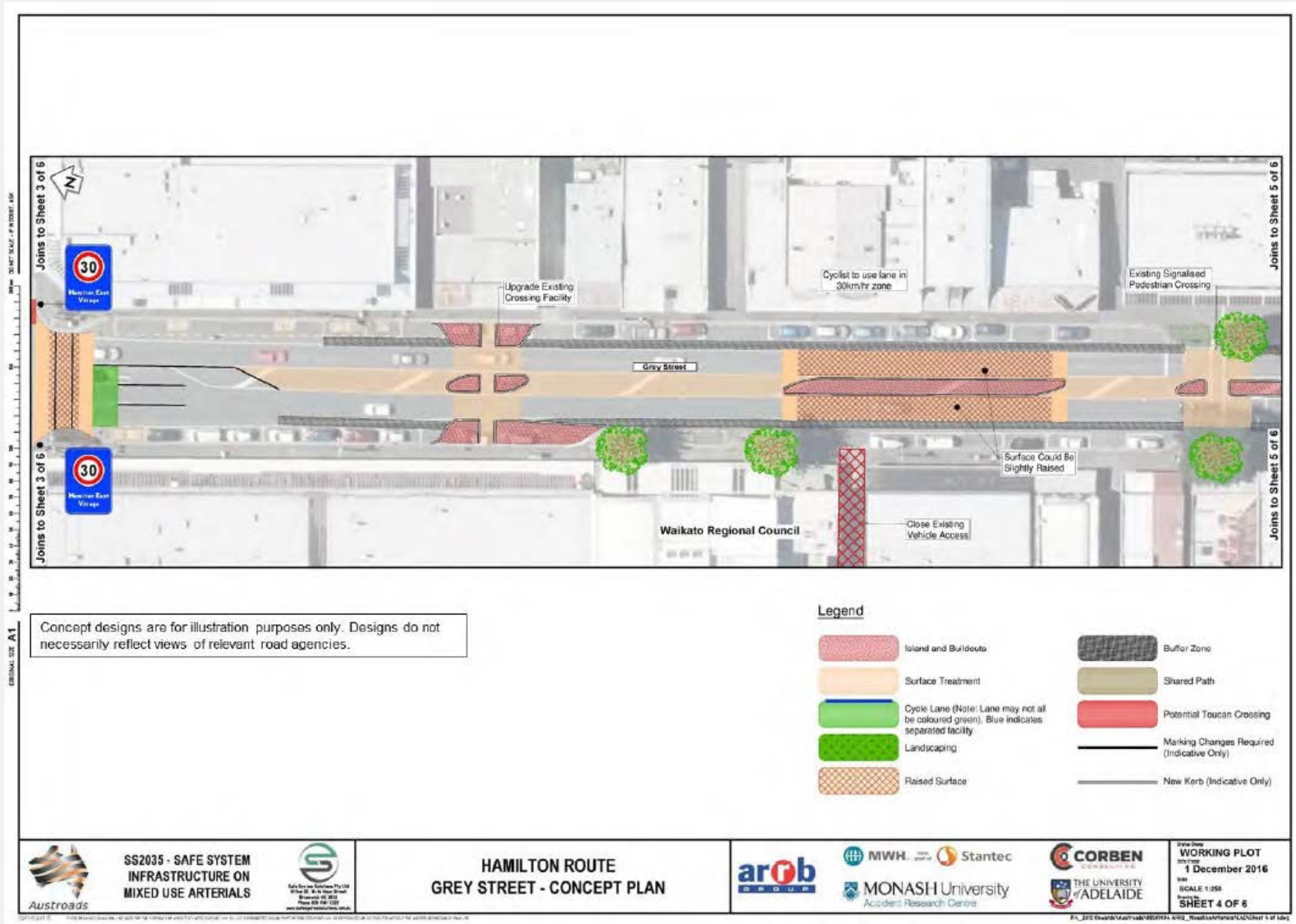
Appendix B	**Glen Huntly Road, Melbourne**
Appendix C	**Unley Road, Adelaide**
Appendix D	**Bondi Road, Sydney**
Appendix E	**Melrose Drive, Canberra**
Appendix F	**York Street, Launceston**
Appendix G	**Function Road Classification and Movement and Place**
Appendix H	**Safe System Assessment Framework**


Joins to Sheet 3 of 6
Joins to Sheet 5 of 6
Upgrade Existing Crossing Facility
Cyclist to use lane in 30km/hr zone
Existing Signalised Pedestrian Crossing
Grey Street
Surface Could Be Slightly Raised
Waikato Regional Council
Close Existing Vehicle Access
30
Concept designs are for illustration purposes only. Designs do not necessarily reflect views of relevant road agencies.
Legend
Island and Buildouts
Surface Treatment
Cycle Lane (Note: Lane may not all be coloured green), Blue indicates separated facility
Landscaping
Raised Surface
Buffer Zone
Shared Path
Potential Toucan Crossing
Marking Changes Required (Indicative Only)
New Kerb (Indicative Only)
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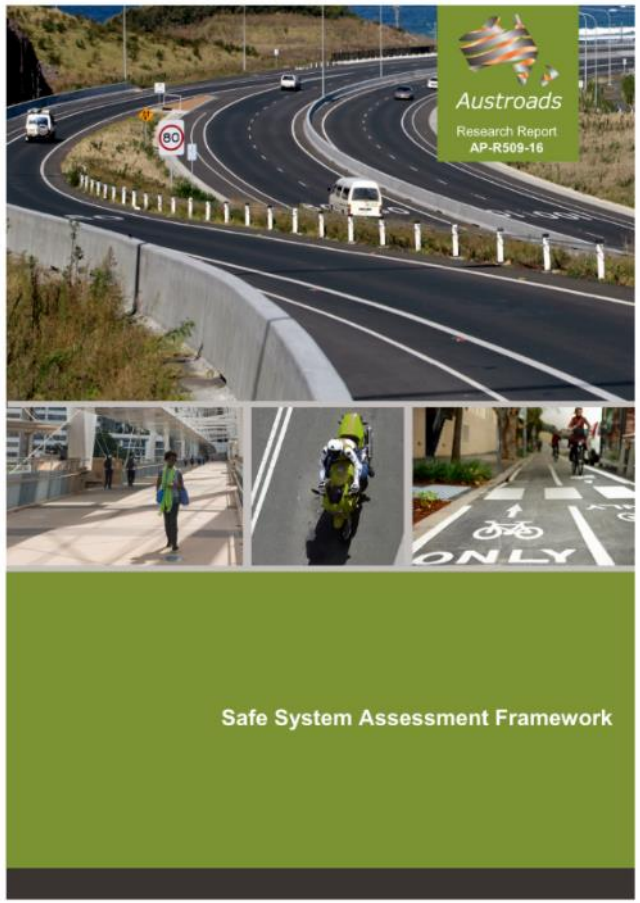
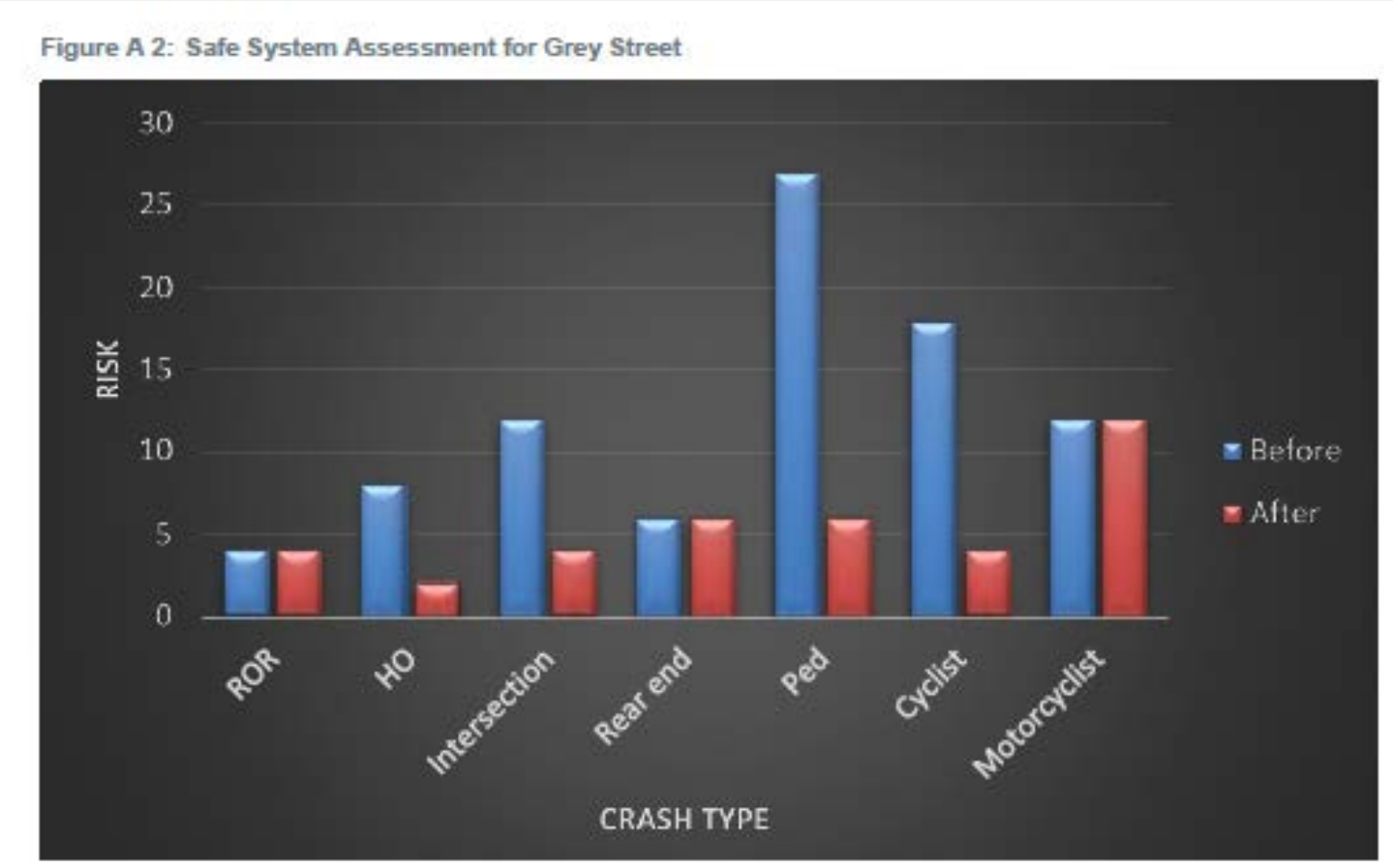
SHEET 4 OF 6

Safe System Assessment Framework





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Key Outcomes

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Key outcomes

See Section 4 and 6

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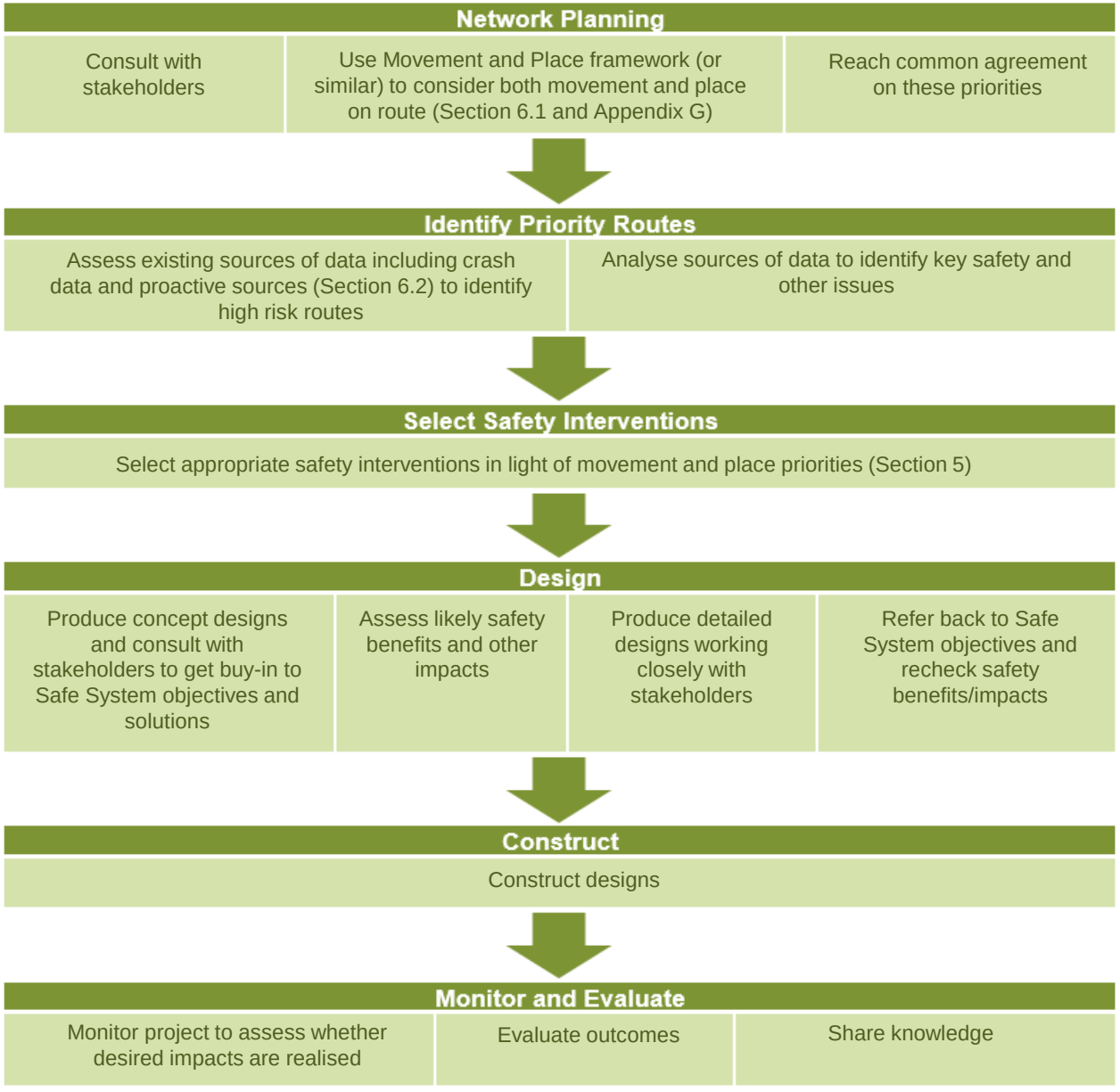
1. Recommended design approach
2. Functional classification/ Movement and Place
3. Packages of treatments
4. Speed
5. Processes for risk assessment
6. Safety benefits of solutions and residual risk

Recommended design approach

See Section 4

Figure 4.1: Steps for effectively addressing risk on mixed use arterials



Functional classification Movement and Place

See Section 6.1

- Common understanding and agreement on intended use of routes within the broader urban context
- Identify different road user groups
- Consultation and agreement from stakeholder
- Movement and Place framework
- Impact on traffic operations

Download Austroads *Guide to Traffic Management Part 5*
https://www.onlinepublications.austroads.com.au/items/AGTM05-17

Figure G 1: Movement and Place Framework

Source: Austroads (2016a).

Packages of treatments

See Section 4.1

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- Route/network perspective vs treating isolated sites

  → consistent approach

- Greater benefits likely when compatible combinations are used

Table 4.1: Packages of treatment options for each route

Route	Speed environment	Gateway	Intersection and/or midblock platform	Raised pedestrian crossing	Roundabout	Narrowing	Colour or texture surface	Cycle path (on or off road)	Access management
Grey Street	✓	✓	✓	✓	✓	✓	✓	✓	✓
Glen Huntly Road	✓	✓	✓			✓	✓		✓
Unley Road	✓	✓	✓	✓		✓	✓	✓	✓
Bondi Road	✓	✓	✓	✓			✓	✓	✓
Melrose Drive	✓	✓	✓	✓	✓	✓	✓	✓	✓
York Street	✓		✓	✓		✓			

Speed

See Section 4.2

Austroads

- Safe System speeds required
- For pedestrians (Corben, D'Elia and Healy 2006):

  40 vs 50 km/h = 75% reduction in fatal risk

  30 vs 50 km/h = 95% reduction
- Higher speeds = need for better vulnerable road user facilities
- Infrastructure to support lower speed environments

Processes for risk assessment

See Section 6.2

Austroads

- Importance and limitations of crash data
  - e.g. change in traffic use and roadside development
- Other risk assessment tools
  - Safe System Assessment Framework: potential fatal and serious injury risks

Safety benefits of solutions and residual risk

See Section 6.3

Austroads

- Risk reduction around 40 – 70% maximum
- Substantial residual risk
- Addressing residual risk:
  - more substantive interventions
  - multiple pillar response required – vehicles / communications, education, publicity and enforcement / post crash care

Table 6.1: Expected fatal and serious injury risk reduction

Route	Location	Expected FSI risk reduction – all road users	Expected FSI risk reduction – pedestrians and cyclists
Grey Street	Hamilton, New Zealand	55%	75%
Glen Huntly Road	Melbourne, Victoria	65%	55%
Unley Road	Adelaide, South Australia	65%	50%
Bondi Road	Sydney, New South Wales	40%	35%
Melrose Drive	Canberra, ACT	40%	35%
York Street	Launceston, Tasmania	55%	50%

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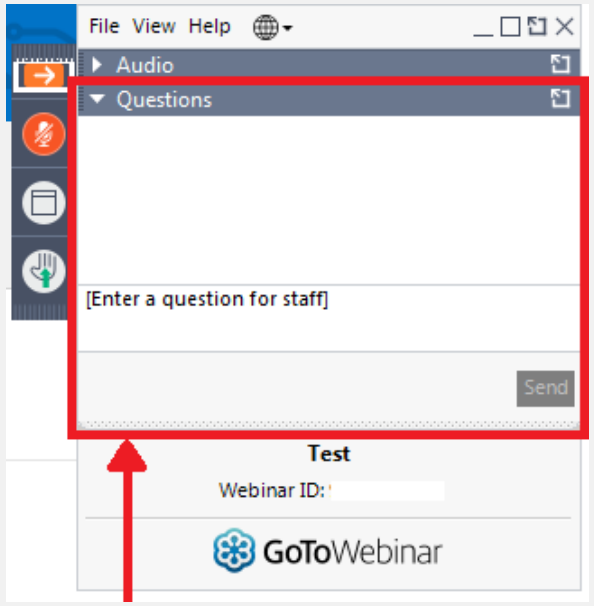

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Let us know the slide number your question relates to

Road Safety Solutions

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Safety solutions

See Section 5

Austroads

Examples	Also consider
Raised intersections	Redistribution of traffic/access management
Roundabouts	Non-infrastructure solutions
Speed management Lane narrowing	
Road diets	
Humps and platforms	
Raised pedestrian crossings	
Gateway treatments	

Raised intersections

See Section 5.1

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Effectiveness

- 40% crash reduction
- 8 km/h reduction in 85th percentile speed

Source: VicRoads 2017, Raised safety platforms – Road Design Note 03-07

Roundabouts

See Section 5.2

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Effectiveness

- 75% crash reduction
- 10 km/h reduction in 85th percentile speed

Speed limits

See Section 5.3

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Effectiveness

- 25% crash reduction
- 6 km/h reduction in 85th percentile speeds

Lane narrowing

See Section 5.4

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Effectiveness

- 30% crash reduction
- 7 km/h reduction in 85th percentile speed

Road diets

See Section 5.5

Austroads

Effectiveness

- 35% crash reduction
- 4 km/h reduction in 85th percentile speed

Humps/platforms

See Section 5.6

Austroads

Effectiveness

- 40% crash reduction
- Up to 25 km/h 85th percentile speed reduction

Raised pedestrian crossings

See Section 5.7

Austroads

Effectiveness

- 40% crash reduction
- 9 km/h 85th percentile speed reduction

Gateway treatments

See Section 5.7

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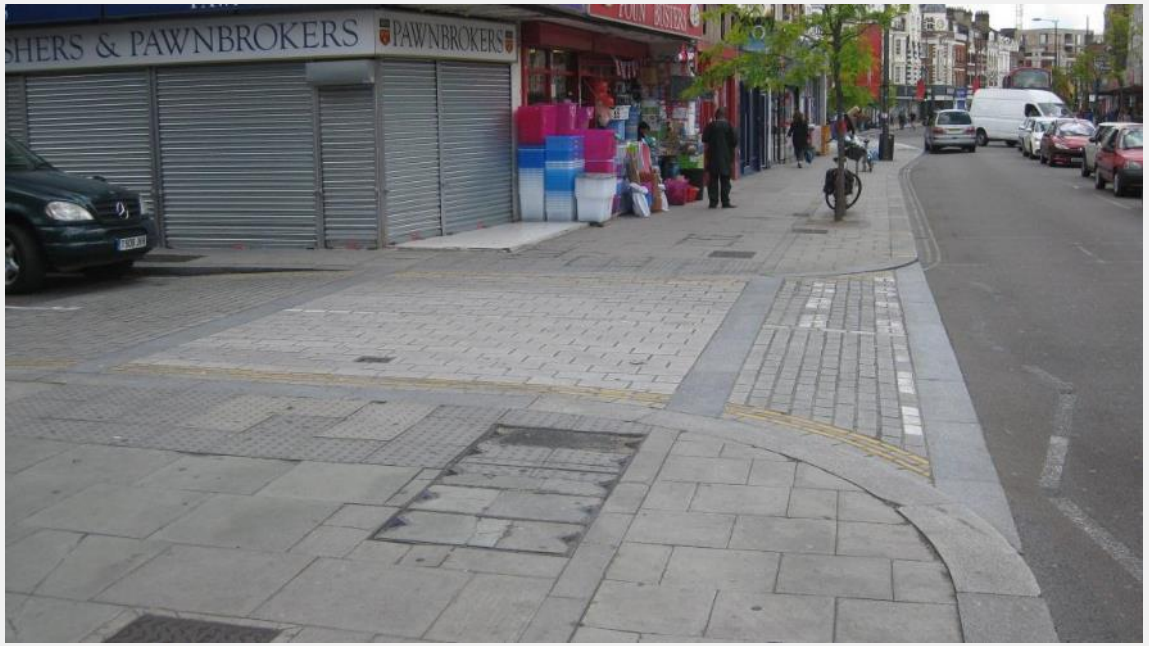
Effectiveness

- 25% crash reduction (rural)
- Up to 25 km/h reduction in 85th percentile speed (rural)



Conclusions

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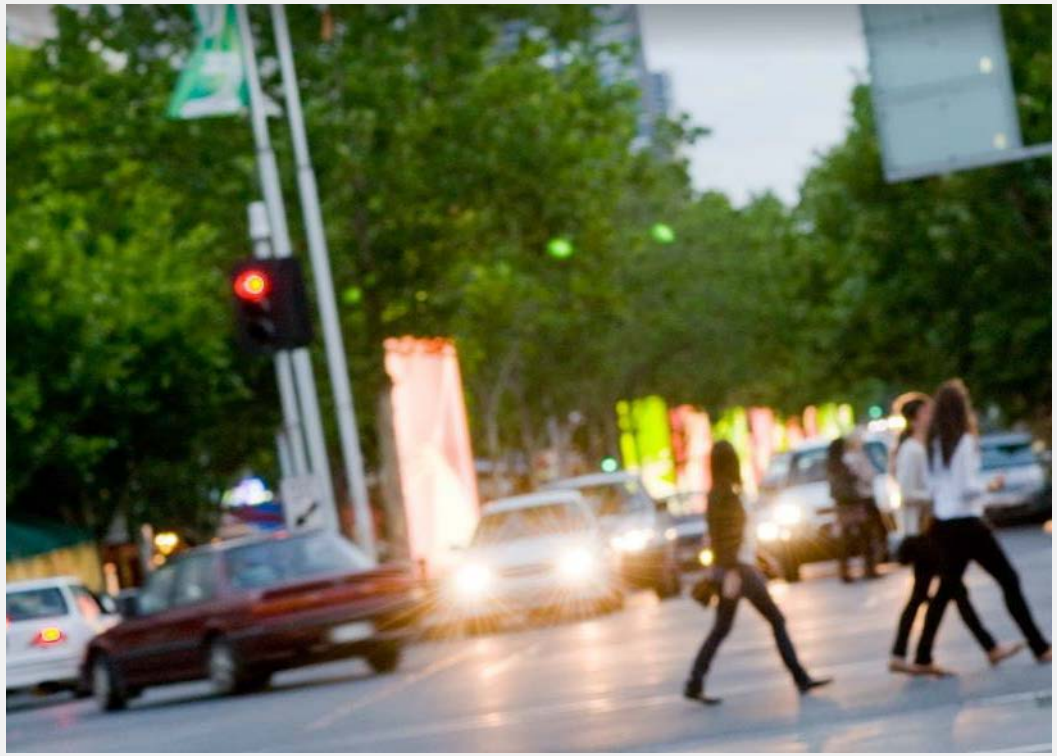
Conclusions

- High crash risk on mixed use arterial roads
- New Austroads document produced on effective solutions
- Movement and place key to making progress
- Speed management supported by appropriate infrastructure
- Packages of treatments
- All Safe System elements required to eliminate risk



Questions?

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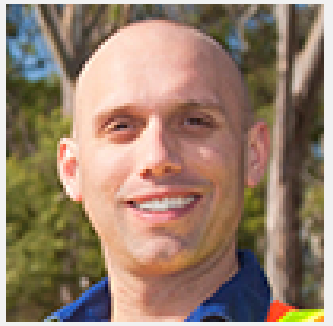

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