



# Assessment of 'Life Line' freight routes

24 February 2017



# Today's moderator

---

## **Eliz Esteban**

Communications Officer  
Austroads

P: +61 2 8265 3302

E: [eesteban@austrroads.com.au](mailto:eesteban@austrroads.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

---



Webinar = 35 mins

Question time = 15 mins



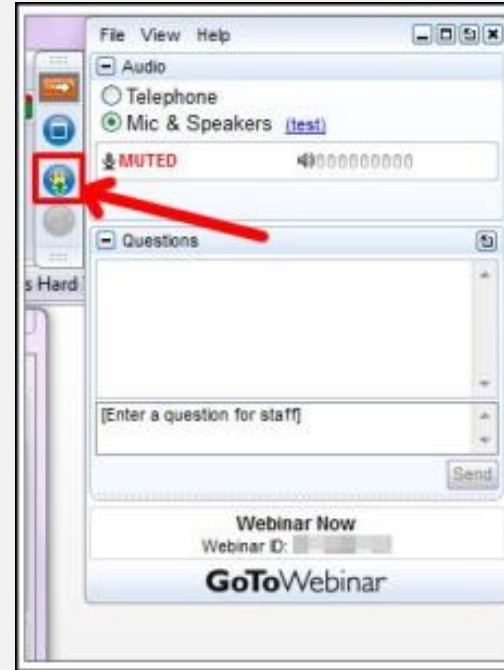
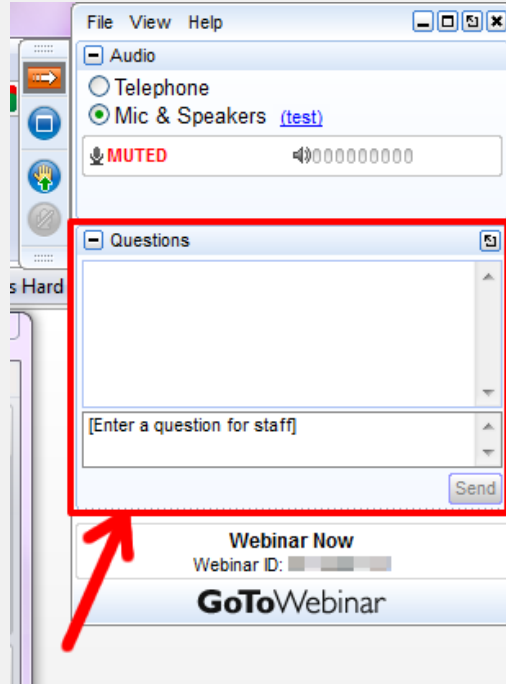
+



=



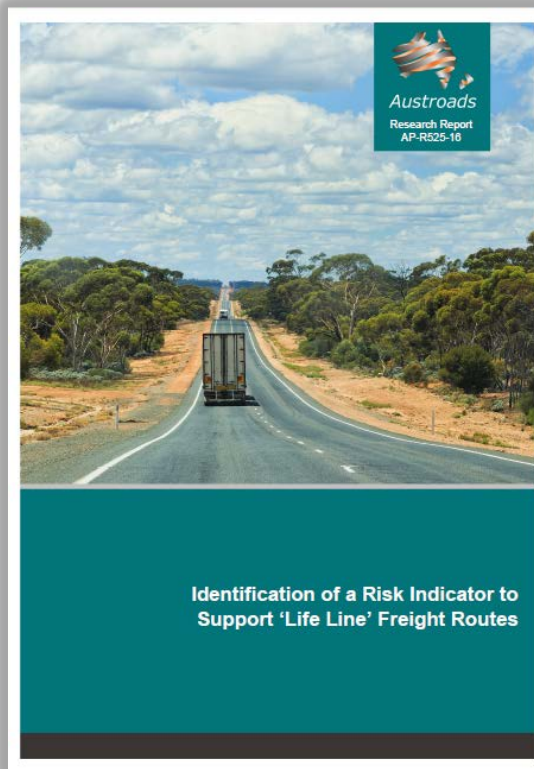
# GoToWebinar functions



Please type your questions here

# Austrroads report

---



Download from Austrroads Website:

<https://www.onlinepublications.austrroads.com.au/items/AP-R525-16>

# Today's presenters

---

## **Steve Manders**

Manager, Transport and Logistics

Jacobs, Melbourne

P: +61 3 8668 3978 / +61 419 878 125

E: [steve.manders@jacobs.com](mailto:steve.manders@jacobs.com)



## **Craig Gorlick**

Senior Economist

Jacobs, Brisbane

P: +61 7 3026 7571 / +61 405 526 170

E: [craig.gorlick@jacobs.com](mailto:craig.gorlick@jacobs.com)



# Background and context

---

- Life Line' freight routes have high value to the communities they serve, and extended closure can have substantial impact
- Emergency response can be expensive and disruptive

# Background and context

---

- Most road upgrade and development project assessment is based on Cost : Benefit outcomes, with traffic volumes, AADT (Average Annual Daily Traffic), value of travel time savings and similar measures commonly the primary assessment
- Projects to improve lightly used remote and regional routes rarely achieve positive economic outcomes (BCR and NPV)
- It is generally difficult to achieve funding for such projects
- The output from this project should be useful to road managers in all levels of government assess the 'Life line' status of identified roads, which may provide additional evidence to seek funding and justify expenditure

# Objectives

---

- To develop and test a Risk Indicator to identify and assess the potential for freight routes to be 'Life Lines' for the communities, businesses and regions they serve
- Seek to supplement existing assessment measures in the Australian Transport Assessment and Planning (ATAP) and NZ equivalents
- Aiming to find another assessment approach providing additional evidence of the value of upgrade projects on these sorts of roads

# 'Life Line' characteristics

---

- The Risk Indicator must assess 'Life Line' characteristics:
  - Size and needs of communities serviced
  - Availability of alternatives (if the route in question is closed)
  - Length, convenience and maximum vehicle class for alternative routes
  - Likelihood alternative route/s are also closed
  - Historic incidence of closure and operational limitations
  - Assessment of responses to previous incidents

# The 'Life Line' Risk Indicator tool

---

- A simple Excel based indicator tool to assess whether or not the route is likely to be a 'Life Line':
  - Availability of alternatives
  - Suitability and feasibility of alternatives
  - Risk of route closure
- Requires scoring the route on 13 dimensions
  - Scores 1 – 5 or 1 – 3

# Assessment of a route's 'Life Line' status

---

1. Presence of alternative routes  
Road, rail, water, air  
→ Score 1 – 5
2. Communities supported  
Population, industry,  
seasonality of demand  
→ Score 1 – 3
3. Closure history and outlook  
Frequency, length,  
predictability  
→ Score 1 – 3
4. Closure impact  
On population, industry  
→ Score 1 – 5
5. Alternative/s available when  
needed?  
→ Score 1 – 5



# The 'Life Line' indicator tool

## Risk Indicator Tool

Important notes: Life Line' scores are LOW; non 'Life Line' scores are HIGH  
 Separation criteria for Life Line vs non Life Line:  
 Scores below 50 indicate 'Life Line' route highly probable  
 Scores above 80 indicate 'Life Line' route highly unlikely  
 Scores between these figures indicate aspects of 'Life Line' route characteristics present



	Presence of alternatives				Community			Closure history, outlook			Closure impact		Alternatives available when needed?	Total Score	Outcome
	Score 1 - 5				Score 1 - 3			Score 1 - 3			Score 1 - 5				
	Road	Rail	Water	Air	Pop'n	Ind- ustry	Season- ality	Frequ- ency	Length	Predict- ability	Pop'n	Ind- ustry	Score 1-5		
<i>Region or group</i>															
[demo 1]	3	2	2	2	3	2	1	2	2	2	1	1	1	<b>50.0</b>	Life Line
[demo 2]	3	2	2	2	2	2	2	2	2	2	1	1	1	<b>50.3</b>	uncertain
[demo 3]	4	3	2	1	3	2	3	4	4	5	2	2	1	<b>79.7</b>	uncertain
[demo 4]	4	3	2	2	3	2	3	4	4	5	2	2	1	<b>80.2</b>	non Life Line

# Development and testing of the indicator tool

---

- Each state, territory and NZ was asked to nominate routes for testing:
  - Some that were considered to be ‘Life Lines’
  - Others that were not, despite having some similar characteristics
- Pairs of these routes were scored using the draft indicator tool to assess outcomes

# Development and testing of the indicator tool

---

- Routes were selected as pairs that were as similar to each other as possible
- The desire was to develop an indicator which effectively discriminated between 'Life Line' and non 'Life Line' routes
- Initially the indicator scores were too clustered and did not reliably discriminate between 'Life Line' and non 'Life Line' routes

# Development and testing of the indicator tool

Probable 'Life Line' route	Probable not 'Life Line' route
<b>Australian Capital Territory</b>	
Federal Hwy (Hume Hwy – Canberra from north)	Barton Hwy (Hume Hwy – Canberra from south)
<b>New South Wales</b>	
Bruxner Hwy (Tenterfield – Casino)	White Cliffs Rd (Silver City Hwy – White Cliffs)
<b>New Zealand</b>	
Pouto Rd (Dargaville – Pouto)	Baylys Coast Rd (SH12 – Baylys Beach)
<b>Northern Territory</b>	
Tanami Rd (Alice Springs – Yuendumu)	Kakadu Hwy (Stuart Hwy – Jabiru)
<b>Queensland</b>	
Warrego Hwy (Charleville – Roma)	Kennedy Development Rd (Winton – Boulia)
<b>South Australia</b>	
Eyre Hwy (Port Augusta – WA border)	Barrier Hwy (Tanunda – Broken Hill)
<b>Tasmania</b>	
Arthur Hwy (Sorrell – Tasman Peninsula)	Esk Hwy (St Marys – St Helens)
<b>Victoria</b>	
Wilson's Promontory Rd (Yanakie – Tidal River)	Grampians Rd (Halls Gap – Dunkeld)
<b>Western Australia</b>	
Great Northern Hwy (Victoria Hwy – Wyndham)	Broome Hwy (Great Northern Hwy – Broome)

# Adjusting parameters to ensure discrimination

---

- Two factors were added and adjusted to increase the discrimination effectiveness
  - One adjusted the relative importance of each factor relative to the others
  - The other multiplied scores to increase the separation between low and high scores

# Adjusting parameters to ensure discrimination

## Risk Indicator Tool

Important notes: Life Line' scores are LOW; non 'Life Line' scores are HIGH  
 Separation criteria for Life Line vs non Life Line:  
 Scores below 50 indicate 'Life Line' route highly probable  
 Scores above 80 indicate 'Life Line' route highly unlikely  
 Scores between these figures indicate aspects of 'Life Line' route characteristics present



	Presence of alternatives				Community			Closure history, outlook			Closure impact		Alternatives available when needed?	Total Score	Outcome
	Score 1 - 5				Score 1 - 3			Score 1 - 3			Score 1 - 5		Score 1-5		
	Road	Rail	Water	Air	Pop'n	Industry	Seasonality	Frequency	Length	Predictability	Pop'n	Industry			
<b>Weighting for assessment dimension</b>	0.95	0.85	0.5	0.5	0.3	0.85	0.6	0.95	0.95	0.6	0.95	0.95	0.95		
<b>Score separation factor</b>	5	2	1	1	1	2	1	2	2	3	5	5	5		
<b>Region or group</b>															
[demo 1]	3	2	2	2	3	2	1	2	2	2	1	1	1	50.0	Life Line
[demo 2]	3	2	2	2	2	2	2	2	2	2	1	1	1	50.3	uncertain
[demo 3]	4	3	2	1	3	2	3	4	4	5	2	2	1	79.7	uncertain
[demo 4]	4	3	2	2	3	2	3	4	4	5	2	2	1	80.2	non Life Line

This separated scores and made discrimination much more consistent

# Scoring

---

- **Presence of alternatives**
  - Separately for road, rail, water and air
  - Score:
    1. If there are no viable alternatives
    2. One (or more) poor alternatives
    3. One or more possible alternatives
    4. One good or several reasonable alternatives
    5. Good alternatives available

# Scoring

---

- **Community impact – population**
  - Score:
    1. Population < 250
    2. Population 250 – 5,000
    3. Population > 5,000

# Scoring

---

- **Community impact – industry**

→ Score:

1. Substantial industry in area serviced
2. Some industry
3. Little or no industry

# Scoring

---

- **Community impact – seasonality**

→ Score:

1. Highly seasonal and closure could coincide with high demand
2. Somewhat seasonal, or less likely to coincide with high demand
3. Demand not seasonal

# Scoring

---

- **Closure history and outlook**

→ Score:

1. Closure frequent, long length or highly unpredictable
2. Neither high nor low on these dimensions
3. Low frequency, short length, highly predictable (eg monsoon)

# Scoring

---

- **Closure impact**

- Separately for impact on population, industry and whether alternative routes are likely to be closed also by the same event

→ Score:

1. Likely to be highly affected
2. Likely to be affected
3. Likely to be somewhat affected
4. Likely to be slightly affected
5. Relatively unaffected

# Let's have a go at using it


## Move to active Excel model

Austrroads

FS2029 - 'Life Line' freight routes

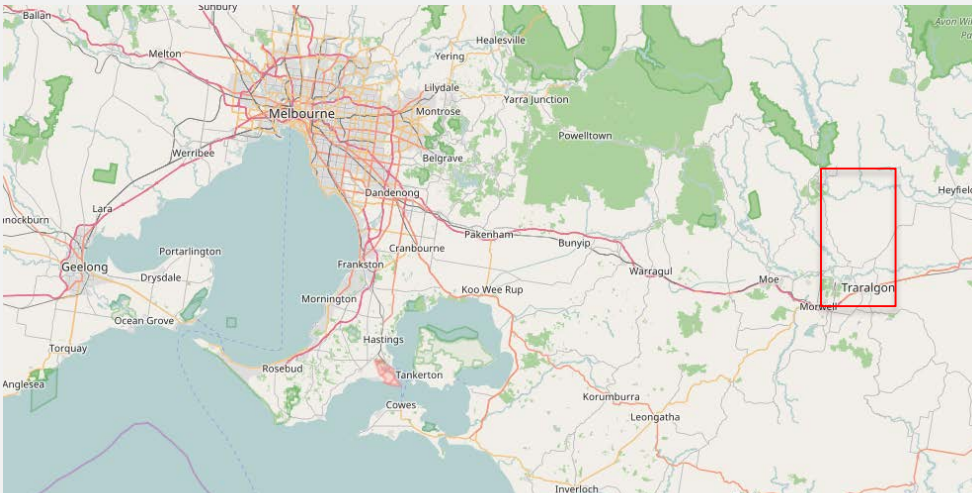
**RISK INDICATOR TOOL**

Important notes: Life Line' scores are LOW; non 'Life Line' scores are HIGH  
 Separation criteria for LL vs non LL:  
 Scores below 50 indicate 'Life Line' route highly probable  
 Scores above 80 indicate 'Life Line' route highly unlikely  
 Scores between these figures indicate aspects of 'Life Line' route characteristics present



Life Line' routes score LOW Non 'Life Line' routes score HIGH	Presence of alternatives				Community			Closure history, outlook			Closure impact		Alternatives available when needed?	Total Score	Outcome
	Score 1 - 5				Score 1 - 3			Score 1 - 3			Score 1 - 5				
	Road	Rail	Water	Air	Pop'n	Ind	Seasonality	Frequency	Length	Predictability	Pop'n	Ind	Score 1-5		
<i>Region or group</i>															
[demo 1]	3	2	2	2	3	2	1	2	2	2	1	1	1	50.0	Life Line
[demo 2]	3	2	2	2	2	2	2	2	2	2	1	1	1	50.3	uncertain
[demo 3]	4	3	2	1	3	2	3	3	3	3	2	2	1	72.3	uncertain
[demo 4]	5	4	2	4	3	2	3	3	3	3	2	2	1	80.2	non Life Line
[route name]														0.0	Life Line
														0.0	Life Line
														0.0	Life Line
														0.0	Life Line
														0.0	Life Line
														0.0	Life Line
														0.0	Life Line
														0.0	Life Line
														0.0	Life Line
														0.0	Life Line
														0.0	Life Line
														0.0	Life Line
														0.0	Life Line
														0.0	Life Line

# First possible 'Life Line' route – Traralgon to Walhalla, Victoria



Maps: Open Street Map

<https://www.openstreetmap.org/#map=9/-38.3330/145.6403>

Melway Street Directory 2017 map X908

Photo: <https://www.travelvictoria.com.au/walhalla/>

<https://www.travelvictoria.com.au/about/photos/>

# Questions?



# Thank you for participating

---

## Contact

Steve Manders  
Manager, Transport and Logistics  
Jacobs

P: +61 3 8668 3978 / +61 419 878 125

E: [steve.manders@jacobs.com](mailto:steve.manders@jacobs.com)