INSTITUTE OF TRANSPORTATION ENGINEERS
AUSTRALIA & NEW ZEALAND SECTION

Welcome to today's webinar

Topic: **Road Safety Star Ratings – Application of AusRAP**

Moderator: David Nash

Principal, Traffinity

Secretary, ITE-ANZ

Stay up to date ITE ANZ @ITE-ANZ Web: www.ite.org.au

WELCOME TO COUNTRY

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.

We acknowledge and respect the Treaty of Waitangi and Maori as the original people of Aotearoa / New Zealand.

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RACV

Annual Breakfast

OBT O'BRIEN TRAFFIC

ARUP

Movement & Place Consulting

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HOUSEKEEPING

Please remain on mute

Questions and discussion will be held after the presentations

Enter questions for Q&A through “chat”

INSTITUTE OF TRANSPORTATION ENGINEERS
AUSTRALIA & NEW ZEALAND SECTION

Today's webinar

Topic: **Road Safety Star Ratings – Application of AusRAP**

Austroads webinar on Tuesday 23 November: New Directions for AusRAP

Recording available (soon?) at https://austroads.com.au/webinars-and-events

INSTITUTE OF TRANSPORTATION ENGINEERS
AUSTRALIA & NEW ZEALAND SECTION

Speakers

Gabby O'Neill, Assistant Secretary, Head of Federal Office of Road Safety

Mark Ellis, Director, Road Safety Strategy Implementation & Programs, Federal Office of Road Safety

Joseph Le, Senior Manager Safer Roads, Transport for NSW

Kenn Beer, Principal Engineer, Safe System Solutions Pty Ltd

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Australian Government

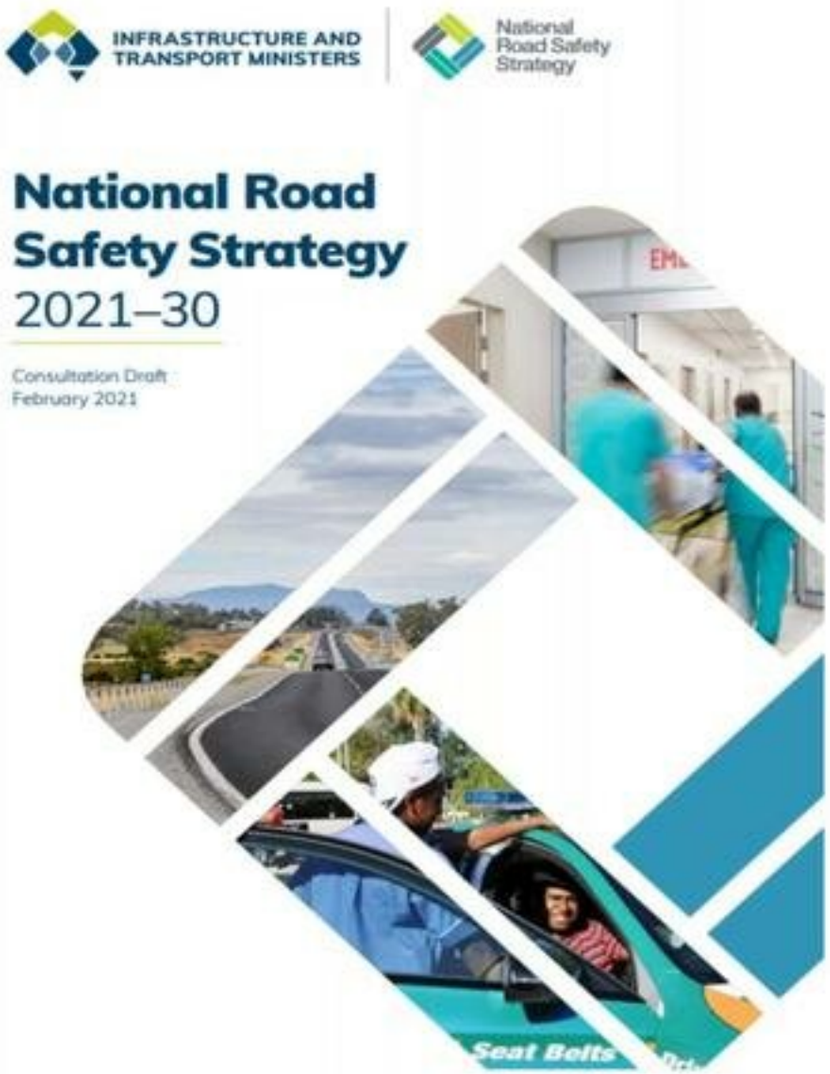
Department of Infrastructure, Transport,
Regional Development and Communications

Institute of Transport Engineers Australia & New Zealand

The use of star ratings in national road safety investment

Presented by Gabby O'Neill and Mark Ellis
Office of Road Safety

National Road Safety Strategy 2021-30 and Action Plan 2021-25



By the end of 2025, **minimum 3-star** or equivalent safety standard on all **national highways and high-speed, high-volume regional roads** covering 80 per cent of travel across the network, with a **long-term aim for 4 or 5 stars** on high-volume roads

Infrastructure

Commonwealth
Fund investment through the National Partnership Agreement for land transport infrastructure projects

States & Territories
Implement Safe System improvements across road networks and provide data to report on the status of national road safety

National Road Safety Data Hub

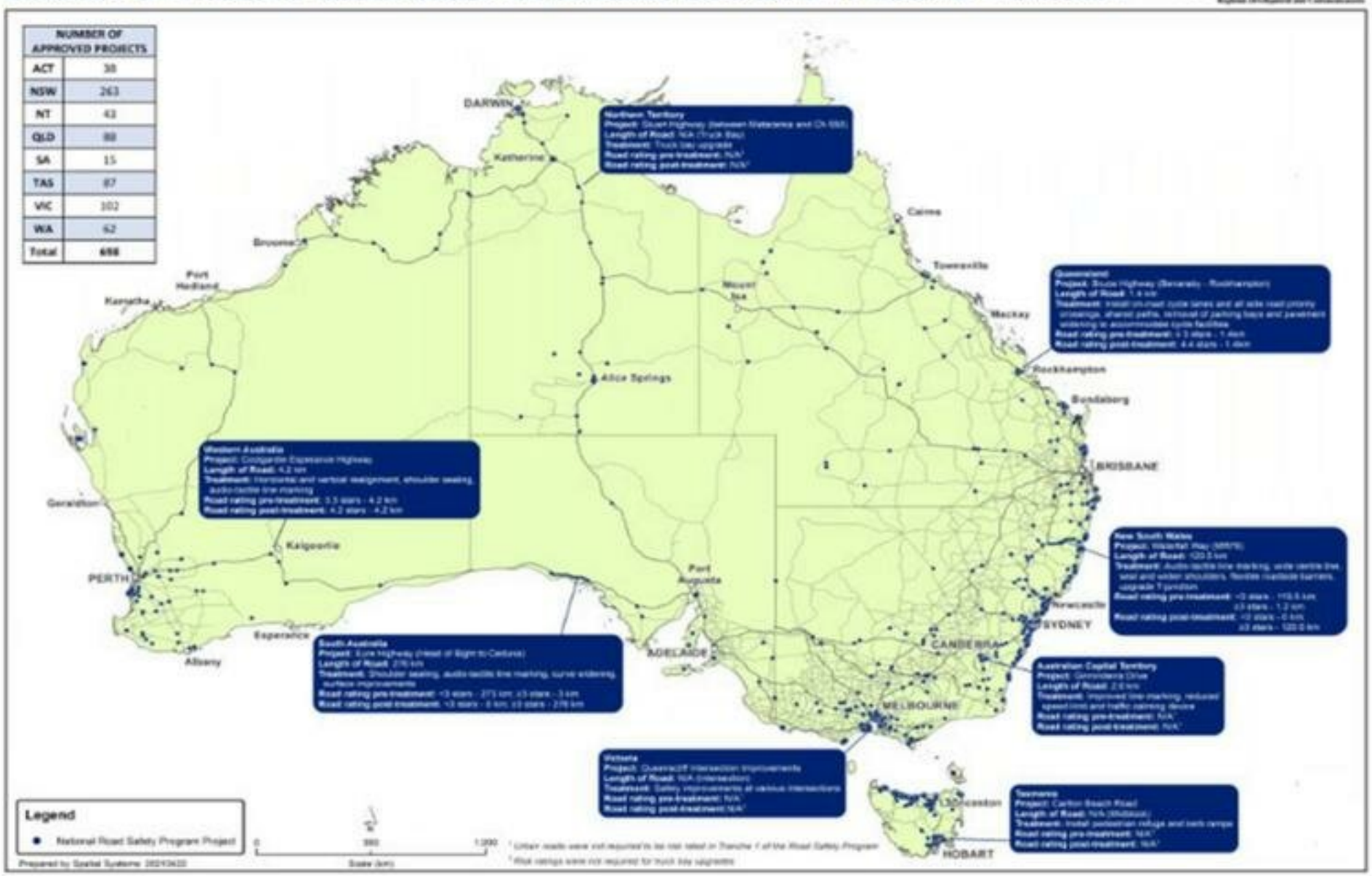
Delivering nationally consistent, credible and consumable data and information to support the prevention of fatal and serious injuries on Australian roads

www.officeofroadsafety.gov.au/data-hub

Tranche 1: 698 project locations

LOCATION OF PROJECTS FUNDED UNDER THE NATIONAL ROAD SAFETY PROGRAM - TRANCHE 1

NUMBER OF APPROVED PROJECTS	
ACT	38
NSW	263
NT	43
QLD	88
SA	15
TAS	87
VIC	102
WA	62
Total	698



Before

After

Images courtesy Main Roads WA

Stay in touch

officeofRoadSafety@infrastructure.gov.au

www.officeofroadsafety.gov.au

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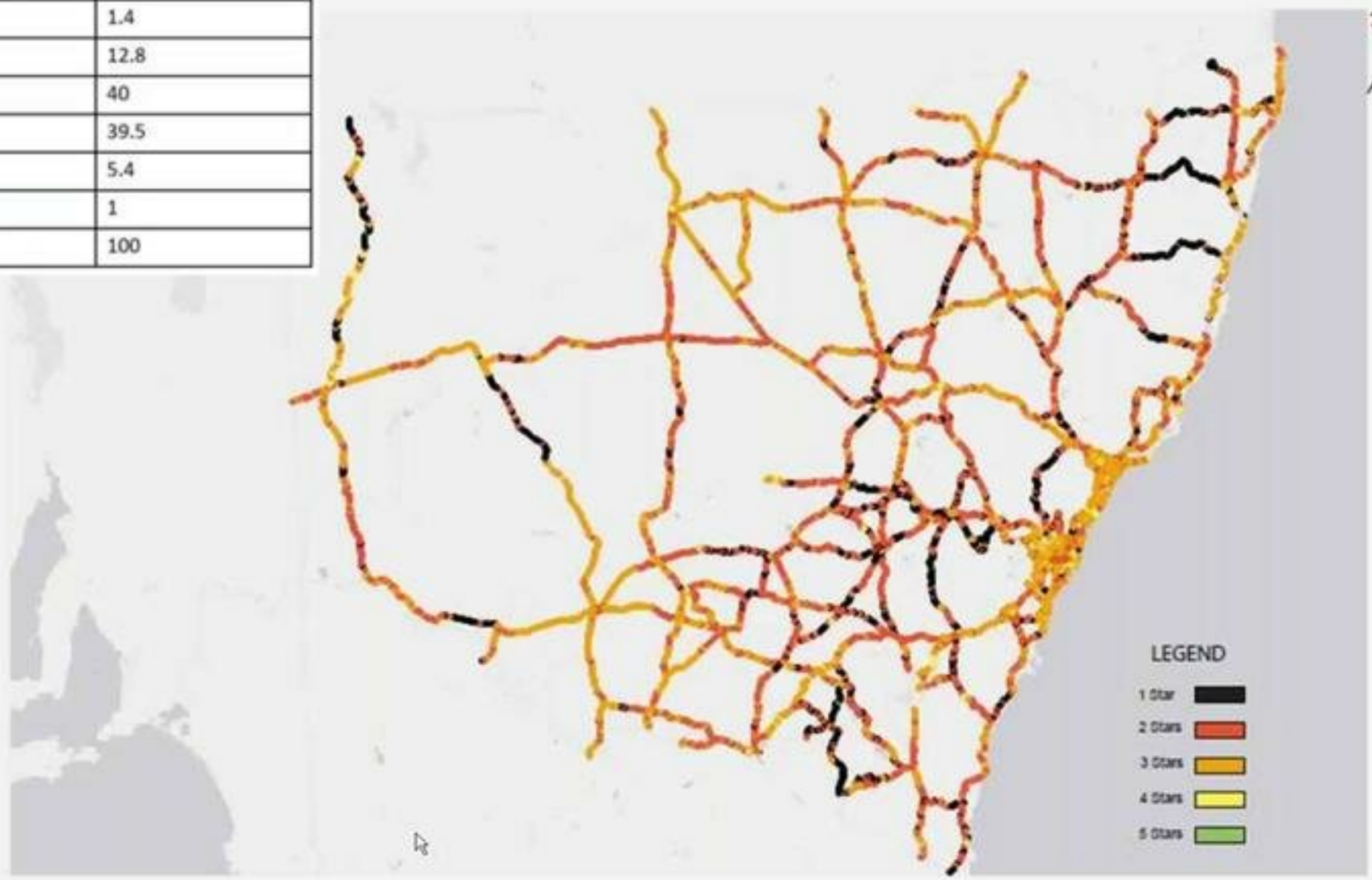
AusRAP Case Study

Joseph Le

NSW Star Rating

STAR Ratings	Length (kms)	% of Network
Null	238.8	1.4
1	2245.8	12.8
2	7029.4	40
3	6943.4	39.5
4	951.6	5.4
5	172.8	1
Grand Total	17,581.72	100



Princes Highway Corridor Upgrade

Austroads

- First Safe System Assessments completed on a major project planning and design
- Major safety benefits in the scope of works

Star ratings	BEFORE (current)		AFTER (proposed)	
	km	%	km	%
5 Stars	4.2	0.9	59.4	12.4
4 Stars	79.7	16.6	280.7	58.5
3 Stars	217.5	45.	137.9	28.7
2 Stars	168.8	35.2	2.1	0.4
1 Star	9.9	2.1	0.0	0.0
Totals	**480.1**	**100**	**480.1**	**100**

Burrendong Way from Mitchell Highway to Calula Creek

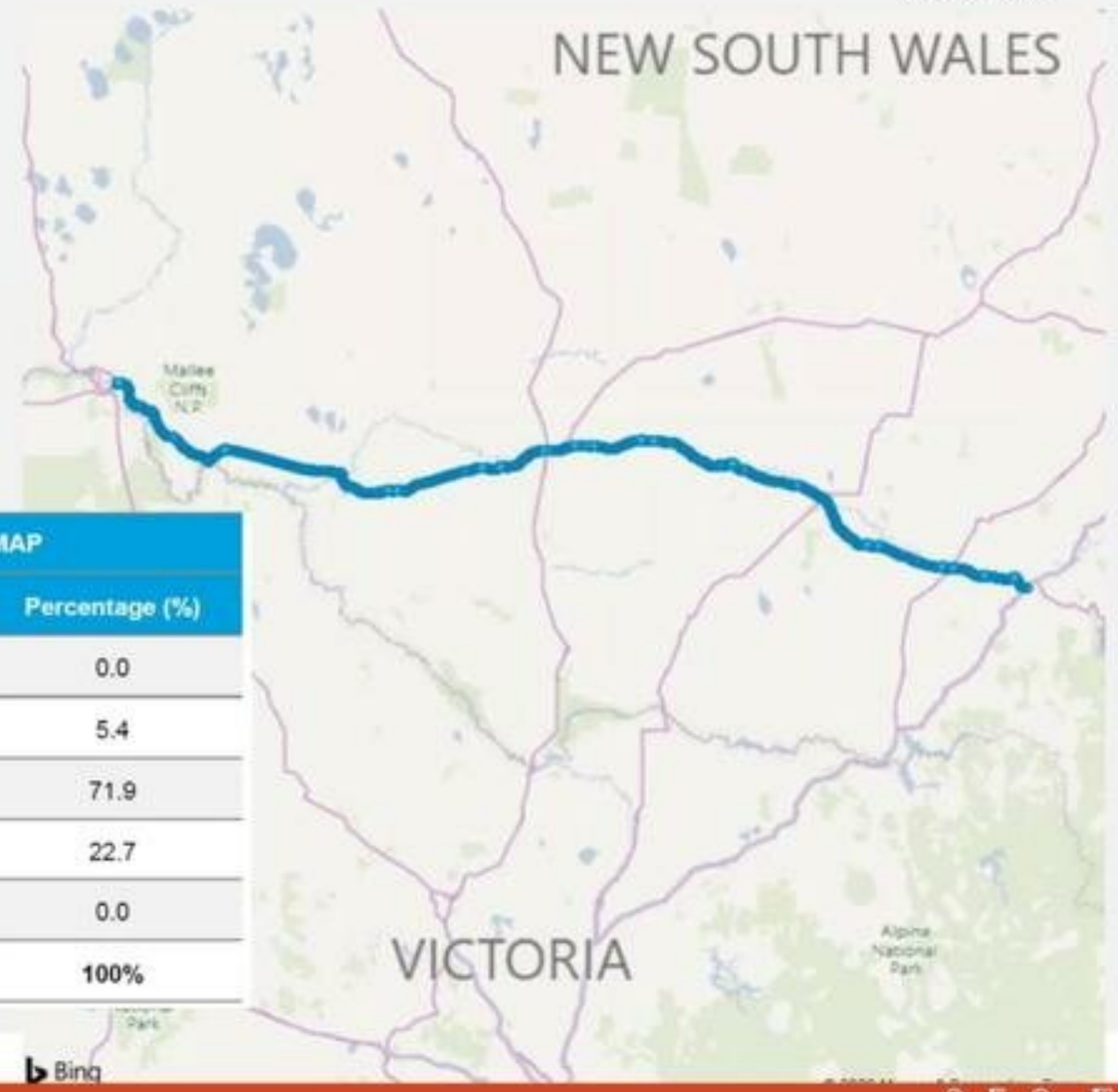
Austroads

60km length project

Key road safety treatments:

- Roadside flexible safety barrier
- Audio-tactile line marking for the whole length
- Shoulder widening
- Intersection upgrades
- Signage and delineation
- Clear zone improvements
- Transverse line marking

Star Ratings	Before MAP		After MAP	
	Length (km)	Percentage (%)	Length (km)	Percentage (%)
5 Stars	0.0	0.0	0.0	0.0
4 Stars	5.2	0.9	32.2	5.4
3 Stars	330.8	55.0	432.4	71.9
2 Stars	189.7	31.6	136.5	22.7
1 Star	75.4	12.5	0.0	0.0
Totals	**601.1**	**100%**	**601.1**	**100%**



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Safe System Planning and Design Principle

Austroads

Figure 1 – Desirable Cross-Section for "Jervis Bay Road to Batemans Bay" section (>12,000 Annual Average Daily Traffic AADT)

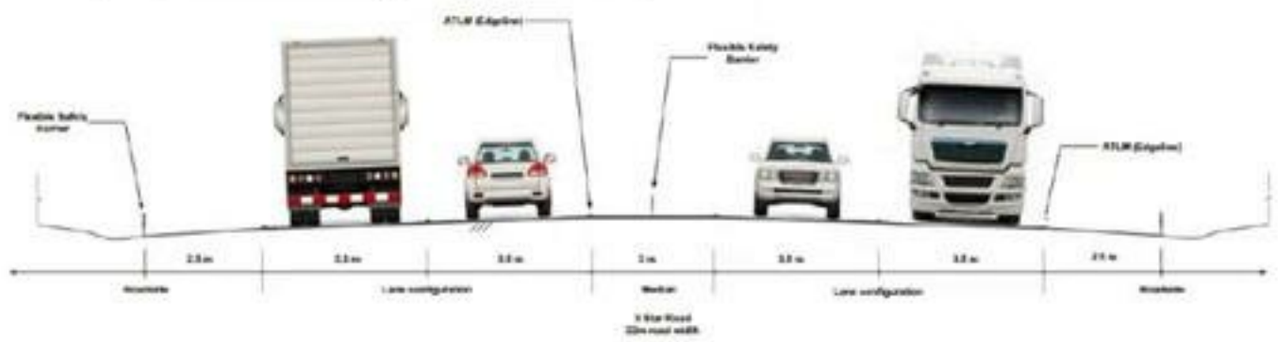
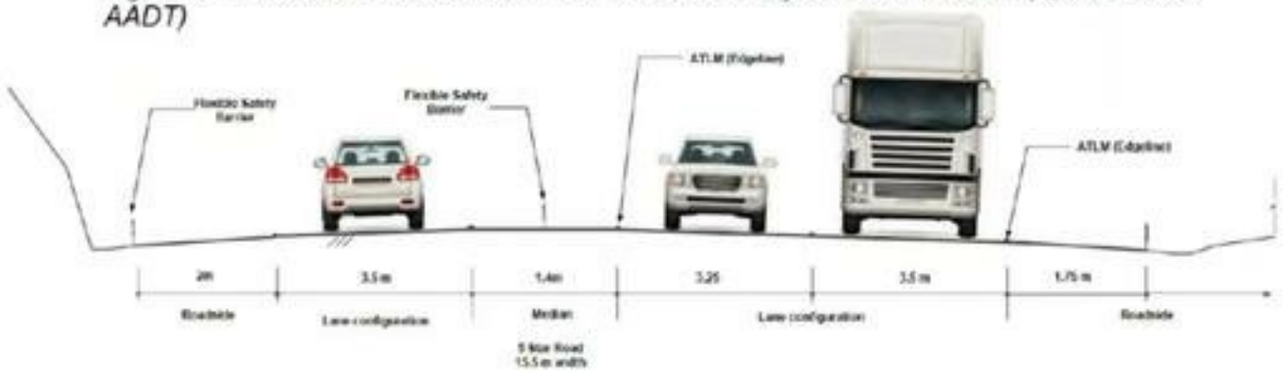


Figure 2 – Desirable Cross-Section for "Batemans Bay to Eden" section (6,000-12,000 AADT)



AusRAP star rating analysis enables prioritisation of infrastructure upgrades at highest-risk locations along the Princes Highway

Safe System Planning and Design Principles maximises the road safety benefit throughout the asset lifecycle once completed

Acknowledgements

Austroads

From the Princes Highway Upgrade perspective, the involvement of the Centre For Road Safety has been key – offering guidance and expert advice on safe systems approaches to road safety across the development of the Strategic Program Business Case, engagement in the program governance and direct input in project and options workshops. This has ensured that the Program keeps road safety front and centre of our decisions.

- *Princes Highway Program Director*

The level of proactive collaboration, engagement and contribution from CfRS teams members enabled them to be effectively embedded in the PHU team to support and inform the direction of the PHU program to achieve the objectives and desired outcomes for each project.

– Princes Highway Lead Project Developer

Additional Projects – Rating of Regional Roads

Austroads

Star Rating

~19,000kms

Star Rating assessment of the regional road network has commenced

18,000kms

complementing the star rating assessment already completed on the state controlled road network.

AiRAP

- New project which leverages readily available commercial and open-source data (e.g. LiDAR, video and satellite data) and automated data analytic techniques (machine learning).
- Proof-of-concept intended to deliver data specifications, compliance and quality assurance processes, to prove the methodologies and provide the framework and confidence levels for AiRAP data generated in NSW
- Final report scheduled for mid-2022

AusRAP - Joseph Le [Read-Only] - PowerPoint

FILE HOME INSERT DESIGN TRANSITIONS ANIMATIONS SLIDE SHOW REVIEW VIEW ACROBAT

Joseph Le

Paste Cut Copy Format Painter — Clipboard

New Slide Layout Reset Section — Slides

Font — Paragraph — Drawing — Editing — Adobe Acrobat — Objective ECM

Arrange Quick Styles Shape Fill Shape Outline Shape Effects

Find Replace Select

Create and Share Adobe PDF

Edit New Version Release and Close Document Details Settings

1 AusRAP Case Study

2 NSW Star Rating

3 Princes Highway Corridor Upgrade

4 Sturt Highway (from Hume Highway to Mildura)

5 Burrendong Way from Mitchell Highway to Cobbs Creek

6

AusRAP Case Study

Joseph Le

Austroads

Click to add notes

SLIDE 1 OF 8 ENGLISH (AUSTRALIA) NOTES COMMENTS 90%

5:15 PM 25/11/2021

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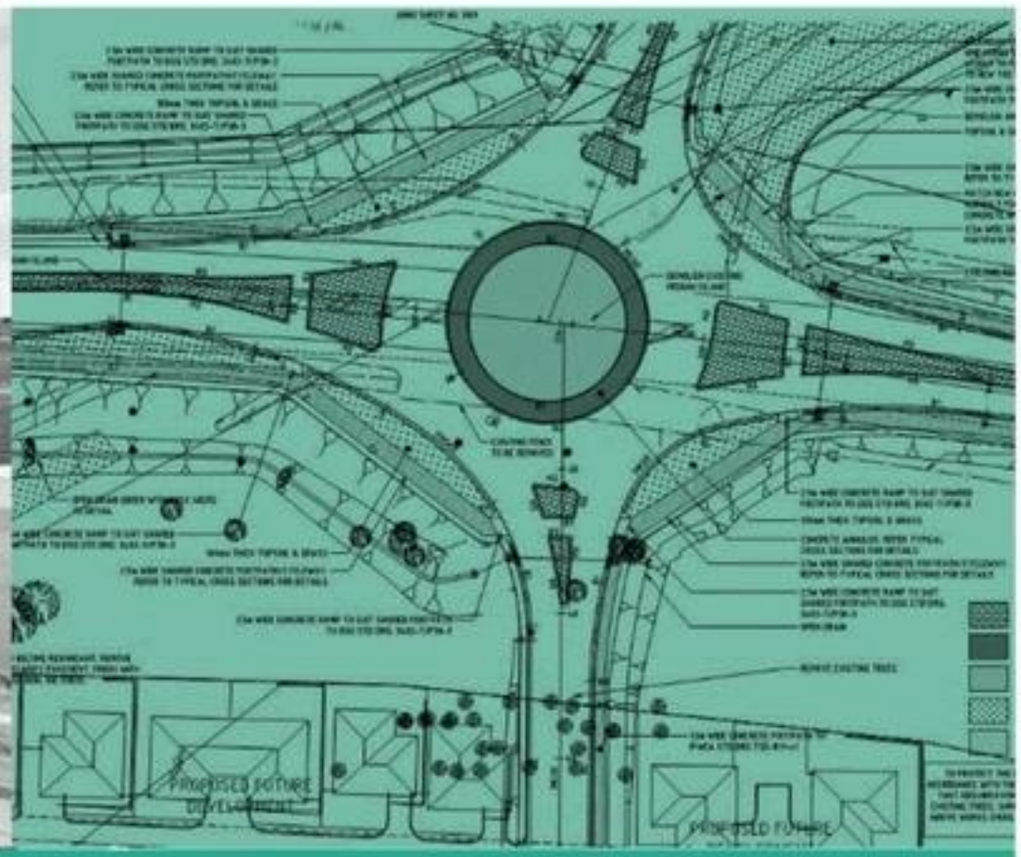
Australia and New Zealand ite

Introduction to
Star Rating for Road Safety Audit
Seminar Presentation



ROAD SAFETY
ENGINEERING | RISK MANAGEMENT | FACILITATION AND TRAINING

SAFE SYSTEM SOLUTIONS
ROAD SAFETY · AUDITING · ENGINEERING · PROJECT DEVELOPMENT

WHY? Experience + Data = Optimal outcome

	Road Safety Audit	iRAP Assessment
Strengths	• Expert experience • Relatively easy process, can be low cost • All safety concerns • Any level of detail • All road users, their capabilities and limitations • All stages of design • All types of roads • Day and night	• Global standard, highly repeatable • Vehicle occupants, motorcyclists, pedestrians and bicyclists • Can be 100 metre or an entire network • Objective metrics enables targets and economic analysis • All existing roads and designs • Results in a central web platform • Global training and accreditation
Limitations	• No global standard • Very dependent on expertise of auditor • Subjectivity • Challenging on long lengths • Tend towards low-cost but low-impact treatments • No financial or quantified impact analysis	• Fixed list of attributes • Segment lengths fixed at 100 metres • performed in daylight and does not consider weather • The quality of results depend on the quality of input data • Results can be misinterpreted • Data requirements for a full assessment

ADB

iRAP

SAFE SYSTEM SOLUTIONS

ROAD SAFETY · AUDITING · ENGINEERING · PROJECT DEVELOPMENT

SR4RSA

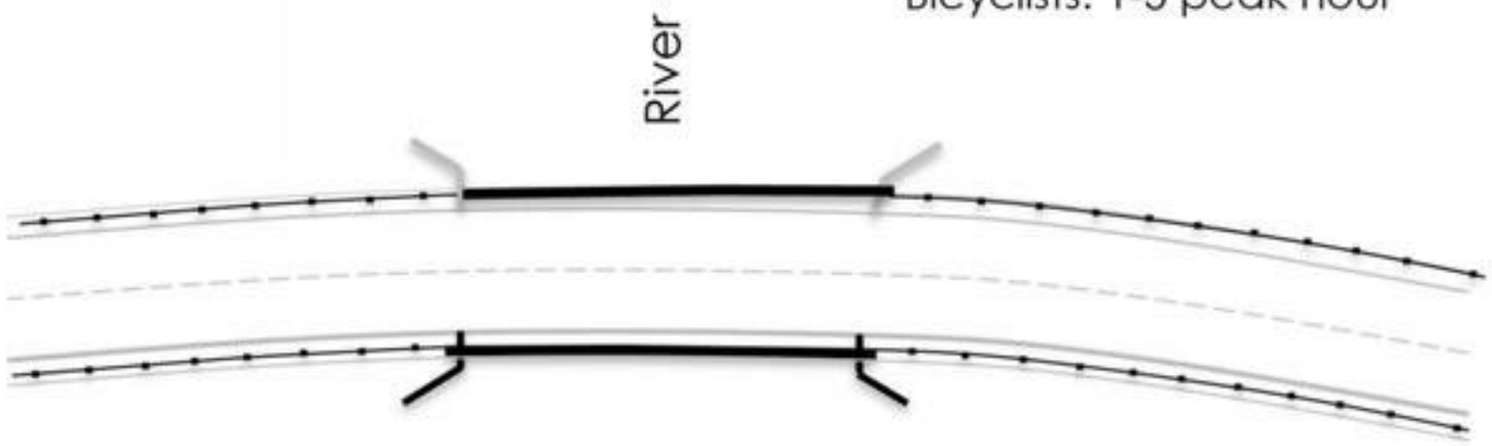
ROAD SAFETY

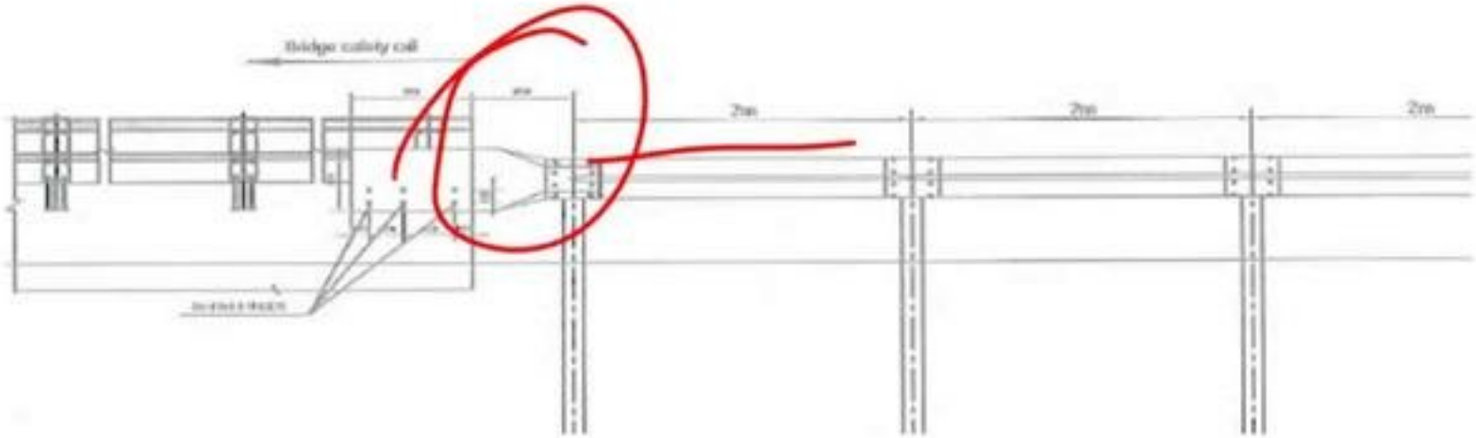
ENGINEERING | RISK MANAGEMENT | FACILITATION AND TRAINING

SAFE SYSTEM SOLUTIONS

Review the design and visit the site

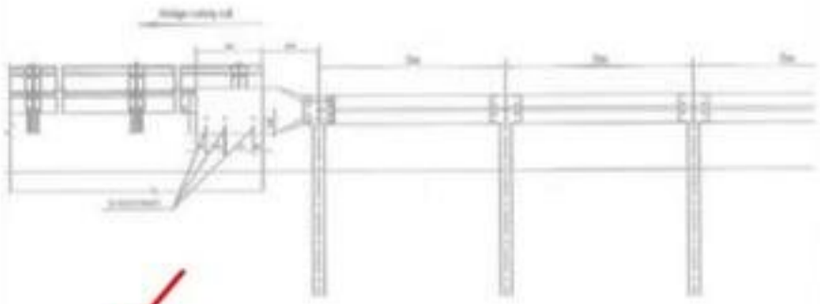
Speed Limit: 100km/h
85th percentile speed: 100km/h
AADT: 7,000
Pedestrians: 1-5 peak hour
Bicyclists: 1-5 peak hour





The Safety Concern

Risk		Frequency of Possible Crash			
		Frequent	Probable	Occasional	Improbable
Severity of Possible Crash	Catastrophic	Intolerable	Intolerable	Intolerable	High
	Serious	Intolerable	Intolerable	High	Medium
	Minor	Intolerable	High	Medium	Low
	Limited	High	Medium	Low	Low

Ref	Safety Concern	Risk
3.1	The transition between guardrail and bridge barrier is not adequate. In the last part of the guardrail there is no stiffening necessary for the transition to the bridge barrier. In the event of a collision, the guardrail would be more deformed than the bridge barrier, which would create a pocketing scenario which would effectively be a rigid obstacle or a spearing hazard. 	Medium Safe System Energy Above tolerable

WWW.VIDA.IRAP.ORG

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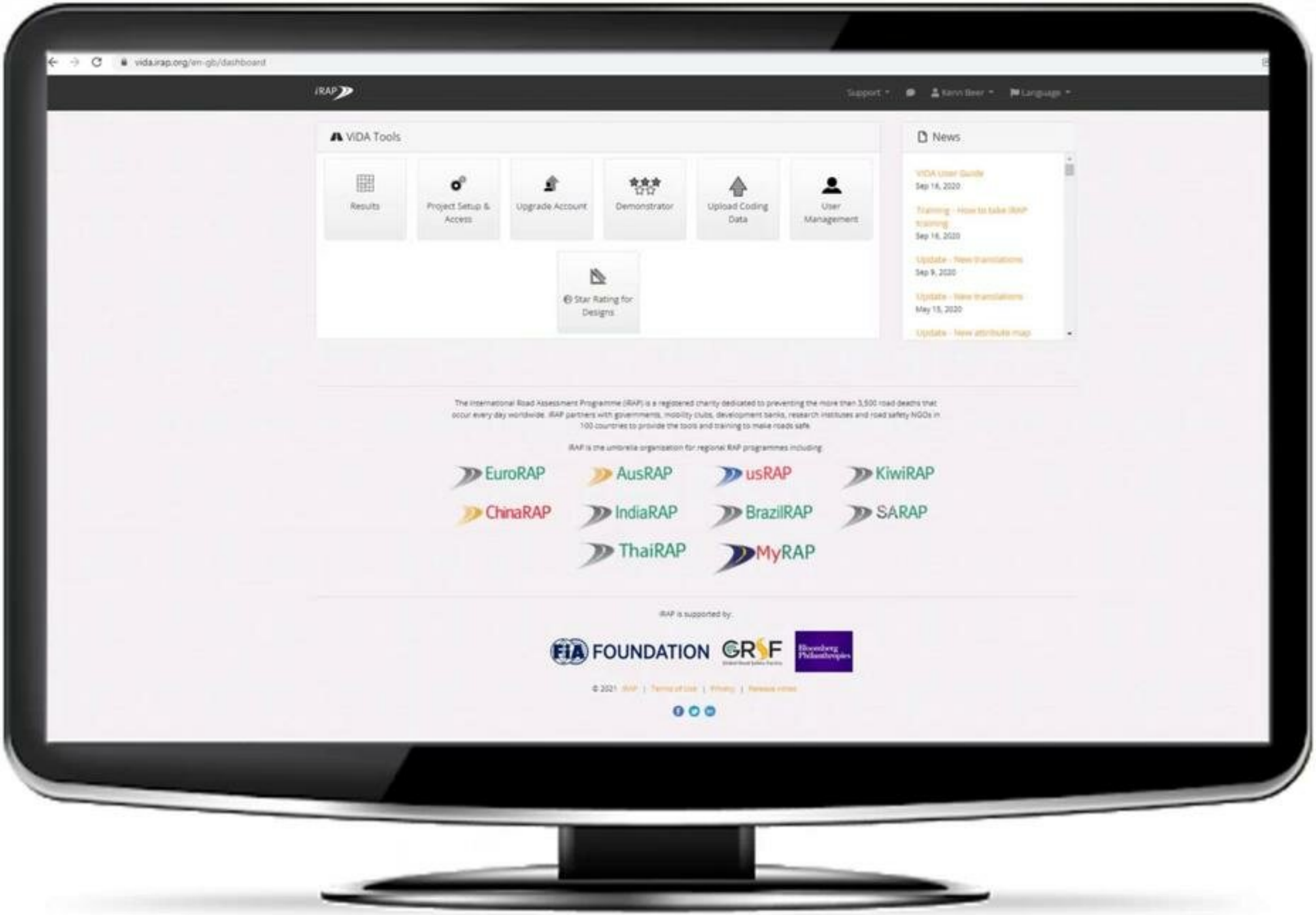
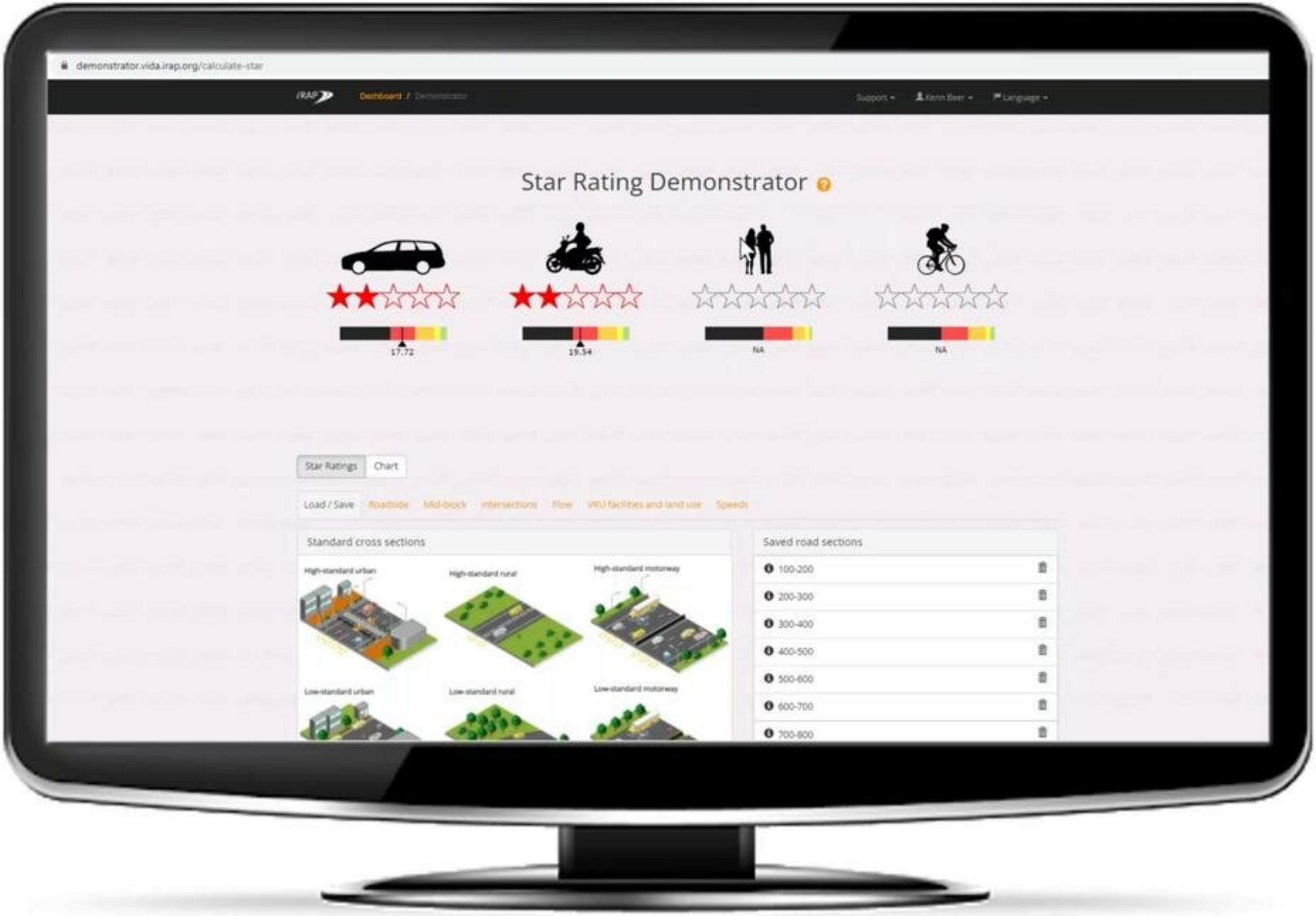
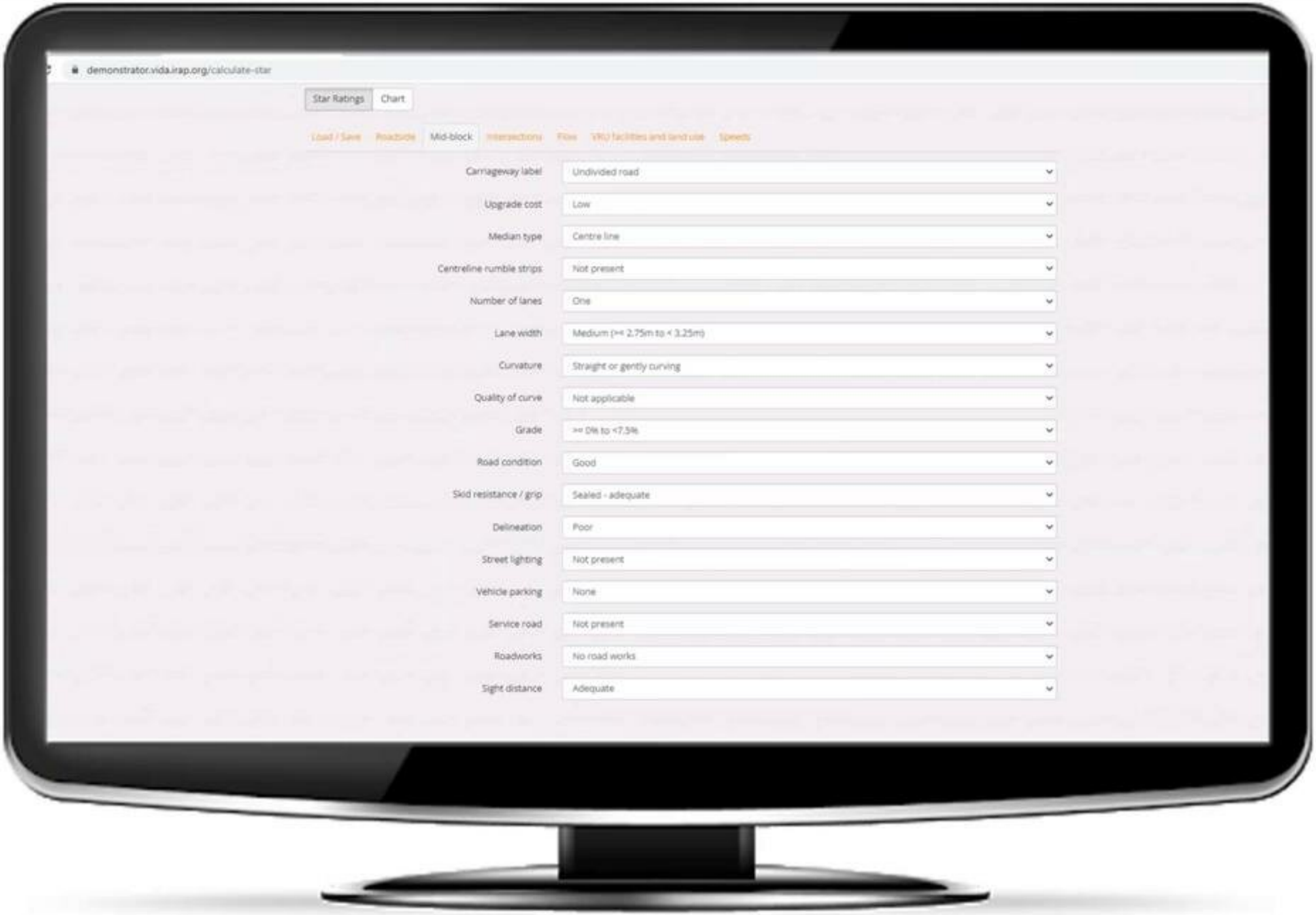
SAFE SYSTEM SOLUTIONS



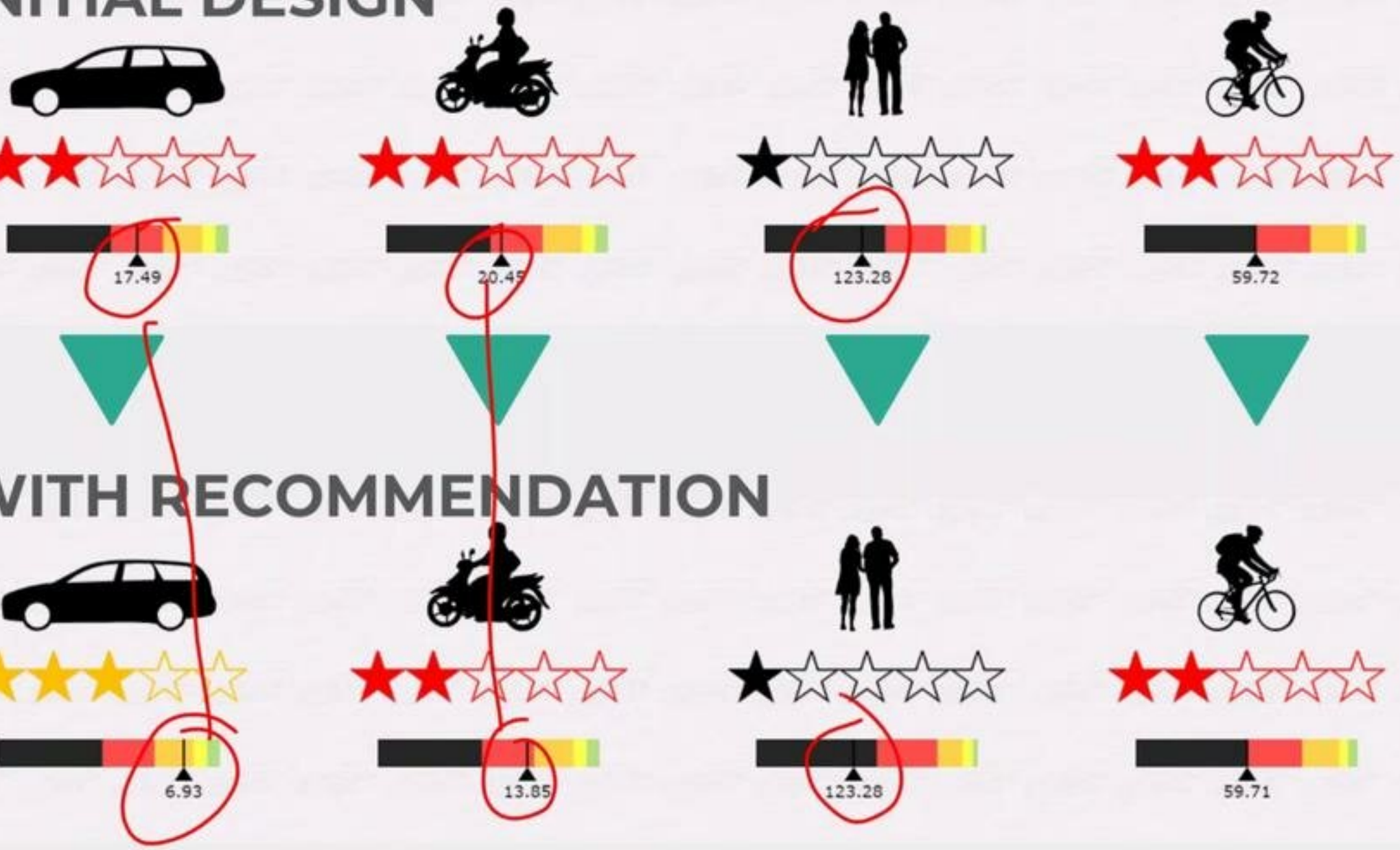



demonstrator.vida.irap.org/calculate-star
Star Ratings
Chart
Load / Save
Roadside
Mid-block
Intersections
Flow
VRU facilities and land use
Speeds
Carriageway label
Undivided road
Upgrade cost
Low
Median type
Centre line
Centreline rumble strips
Not present
Number of lanes
One
Lane width
Medium (>= 2.75m to < 3.25m)
Curvature
Straight or gently curving
Quality of curve
Not applicable
Grade
>= 0% to <7.5%
Road condition
Good
Skid resistance / grip
Sealed - adequate
Delineation
Poor
Street lighting
Not present
Vehicle parking
None
Service road
Not present
Roadworks
No road works
Sight distance
Adequate

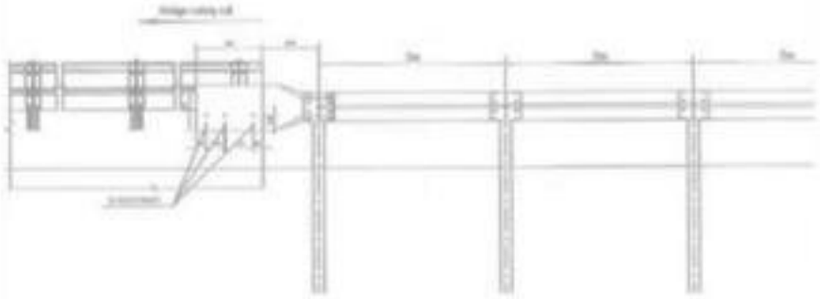
Star rating

Recommendation

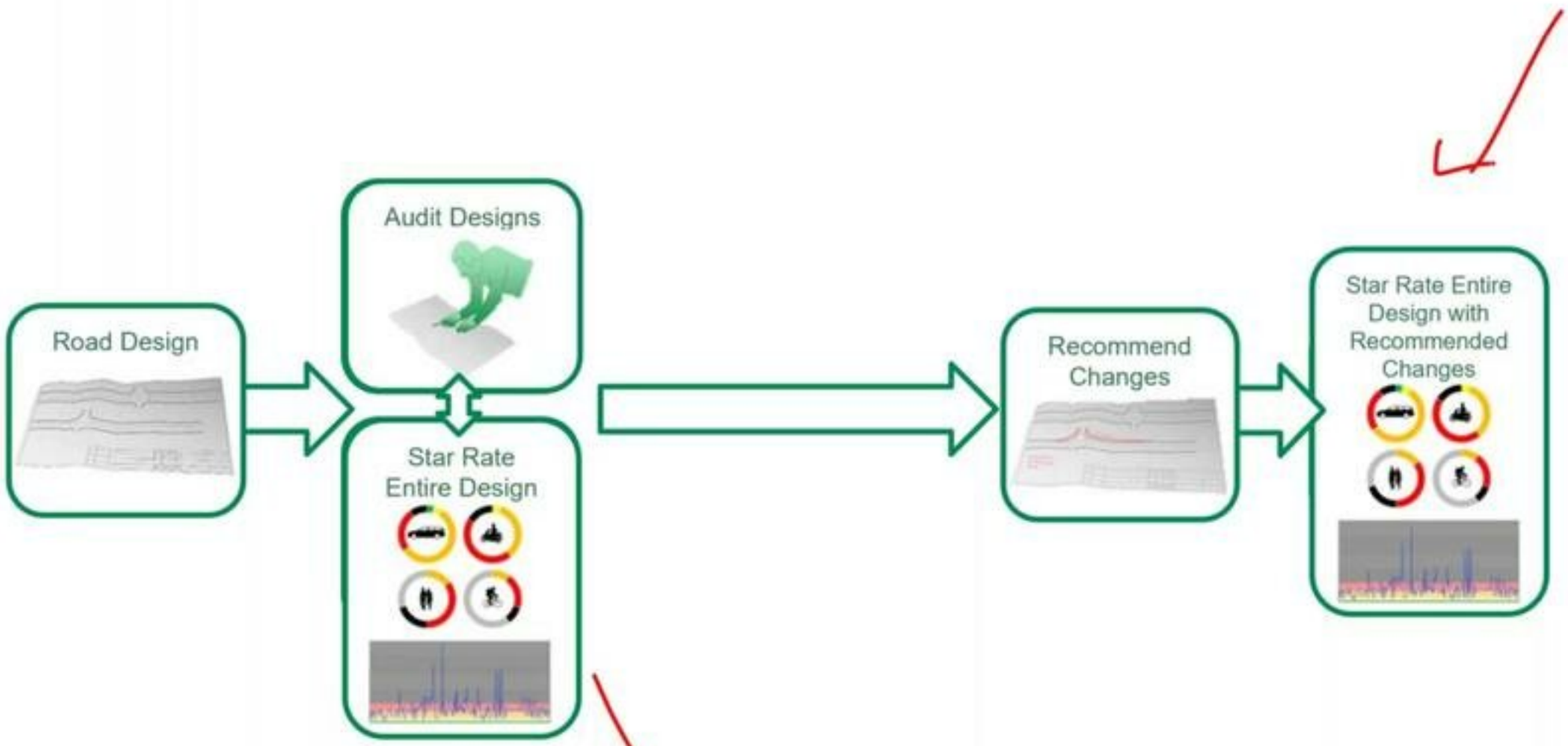
INITIAL DESIGN

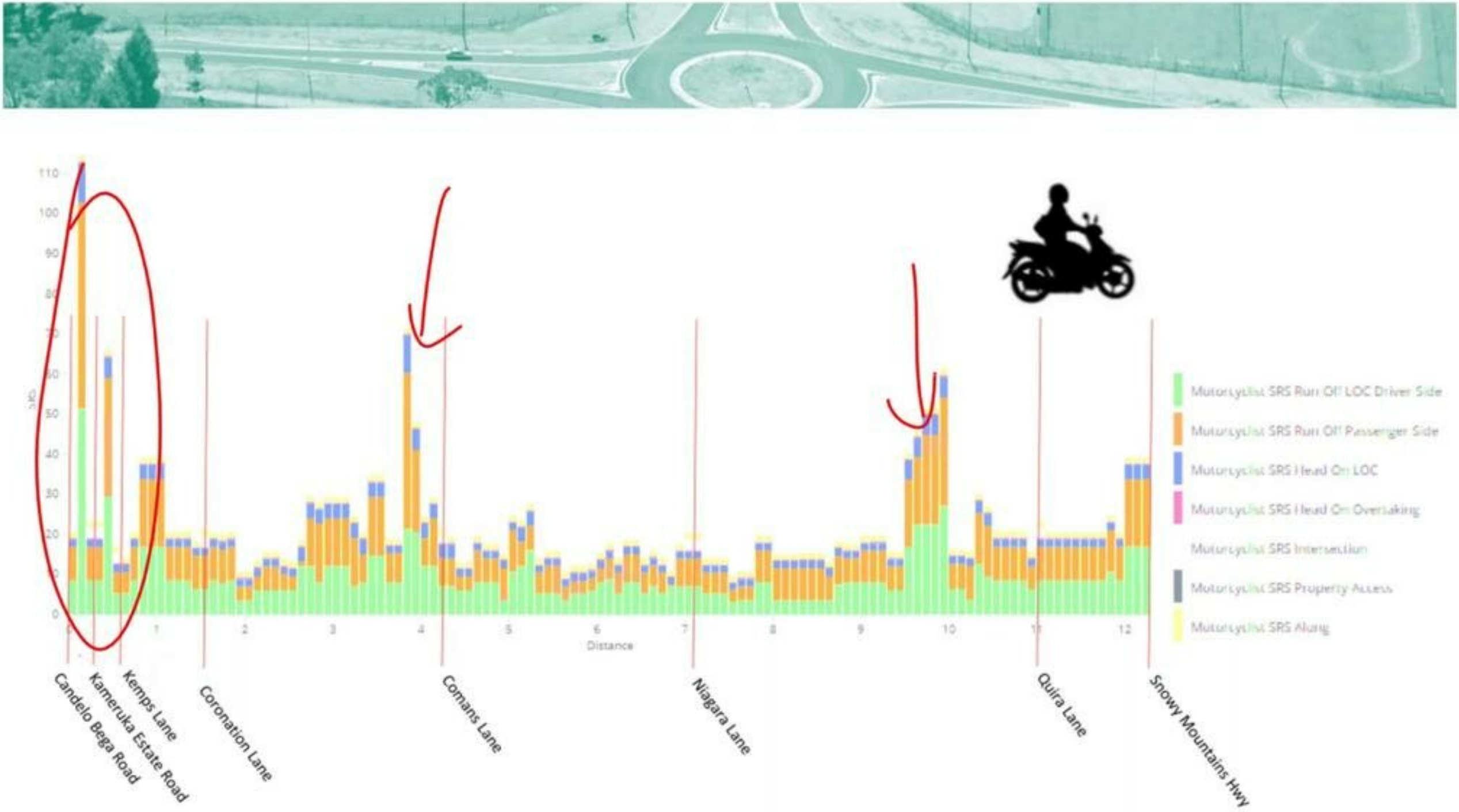


WITH RECOMMENDATION

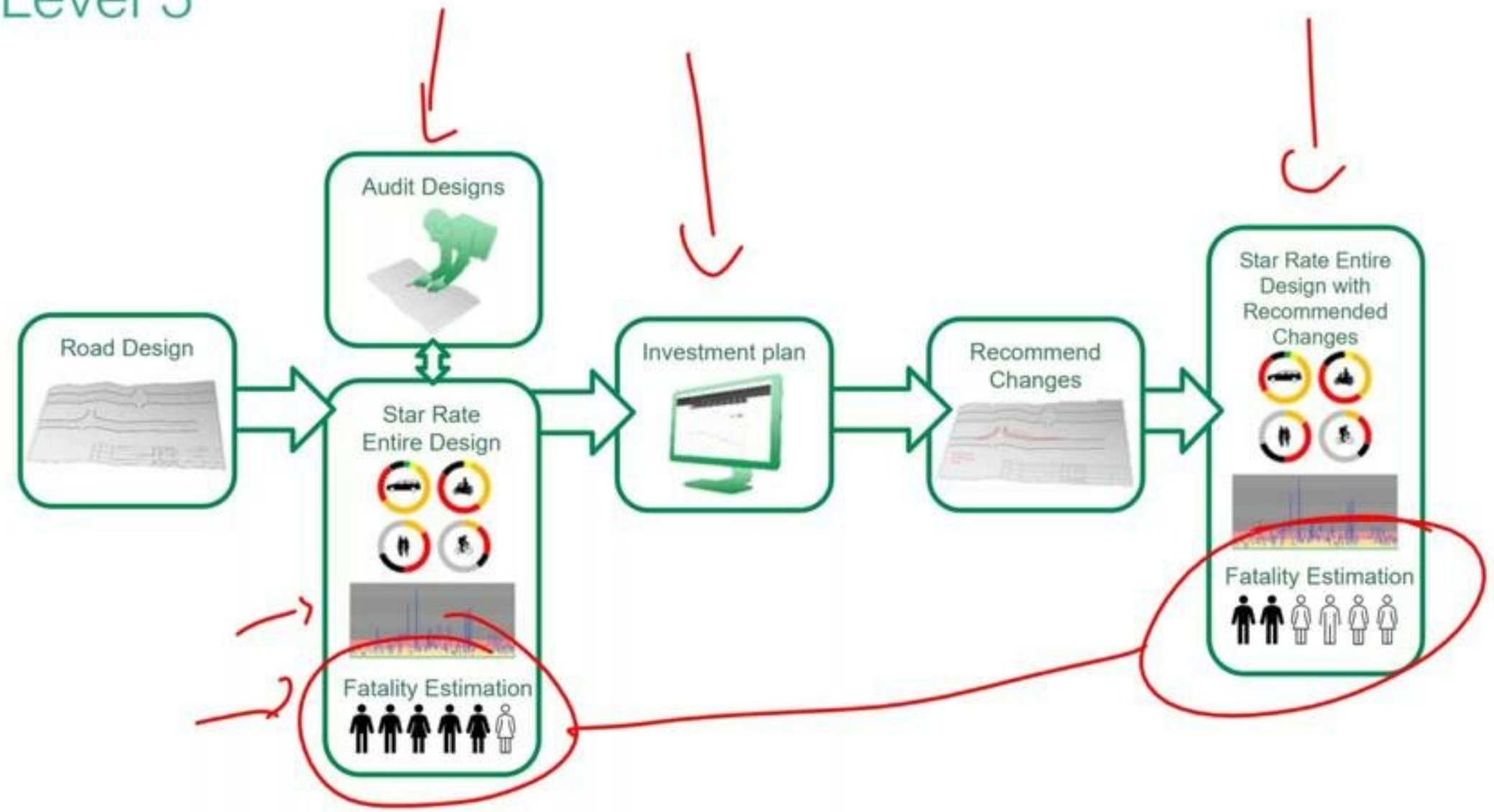
Ref	Safety Concern	Risk	Star Rating (Initial Design)	Recommendation	Star Rating (with recommendations)	Client Response
3.1	The transition between guardrail and bridge barrier is not adequate. In the last part of the guardrail there is no stiffening necessary for the transition to the bridge barrier. In the event of a collision, the guardrail would be more deformed than the bridge barrier, which would create a pocketing scenario which would effectively be a rigid obstacle or a spearing hazard. 	Medium **Safe System Energy** Above tolerable		• Ensure an appropriate and approved transition between the two types of barriers to avoid performance changes (P). This can be achieved by progressive stiffening of the guardrail, for example by reducing the spacing of the posts. 		

Level 2


Road Design
Audit Designs
Star Rate Entire Design
Recommend Changes
Star Rate Entire Design with Recommended Changes


110
100
90
80
70
60
50
40
30
20
10
0
0
1
2
3
4
5
6
7
8
9
10
11
12
Distance
Motorcyclist SRS Run Off LOC Driver Side
Motorcyclist SRS Run Off Passenger Side
Motorcyclist SRS Head On LOC
Motorcyclist SRS Head On Overtaking
Motorcyclist SRS Intersection
Motorcyclist SRS Property Access
Motorcyclist SRS Along
Candelo Bega Road
Kameruka Estate Road
Kemps Lane
Coronation Lane
Comans Lane
Niagara Lane
Quira Lane
Snowy Mountains Hwy

Level 3


Audit Designs
Road Design
Star Rate Entire Design
Fatality Estimation
Investment plan
Recommend Changes
Star Rate Entire Design with Recommended Changes
Fatality Estimation

Star Rating results

Target:
3-stars or
better

EXISTING ROAD

DESIGN

FINAL DESIGN

SR4RSA LEVEL 3

(STARS + FSI + SRIP)

Not applicable | 1 Star | 2 Stars | 3 Stars | 4 Stars | 5 Stars

estimated reduction in Fatal and serious injuries

Initial Highway Upgrade Design (**Before SR4RSA**)

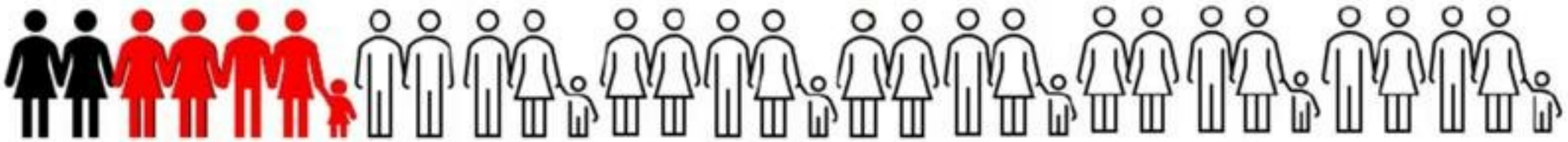
Predicted Fatality and Serious Injuries:

Vehicle Occupants: 3.6 Motorcyclists: 22.8 Pedestrians: 2.7 Bicyclists: 6.2

TOTAL: 35.3

Target: % FSI reduction

Altered Highway Upgrade Design (**After SR4RSA**)



Predicted Fatality and Serious Injuries:

Vehicle Occupants: 1.6 Motorcyclists: 9.8 Pedestrians: 1.4 Bicyclists: 2.2

TOTAL: 15.0

(58% reduction in Fatal and Serious Injuries)

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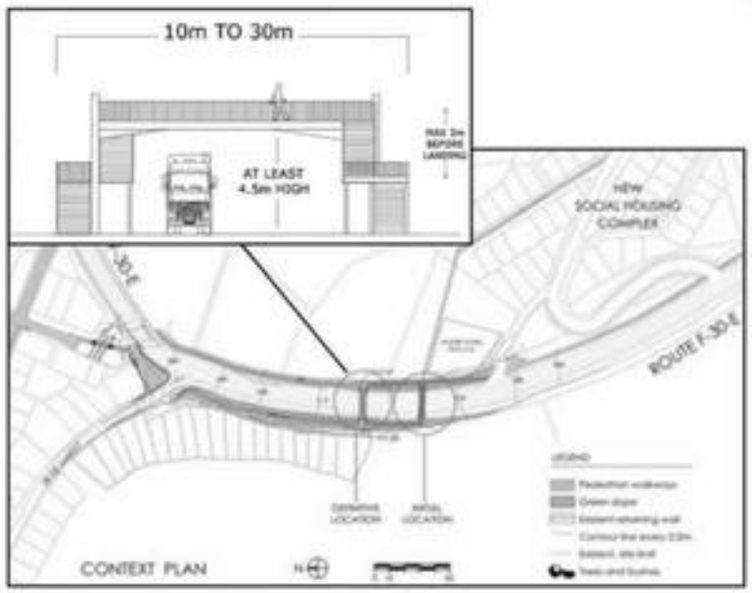
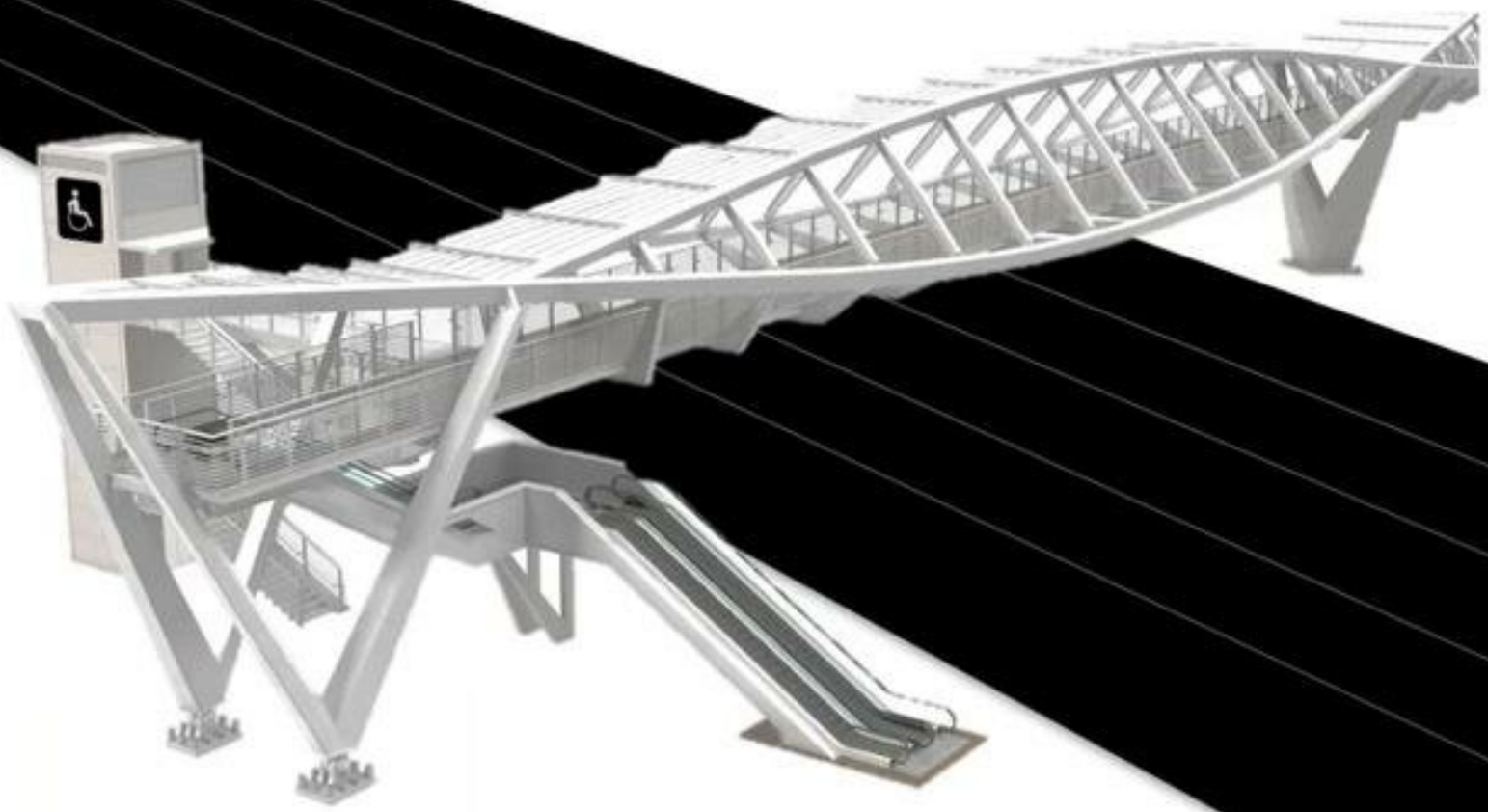
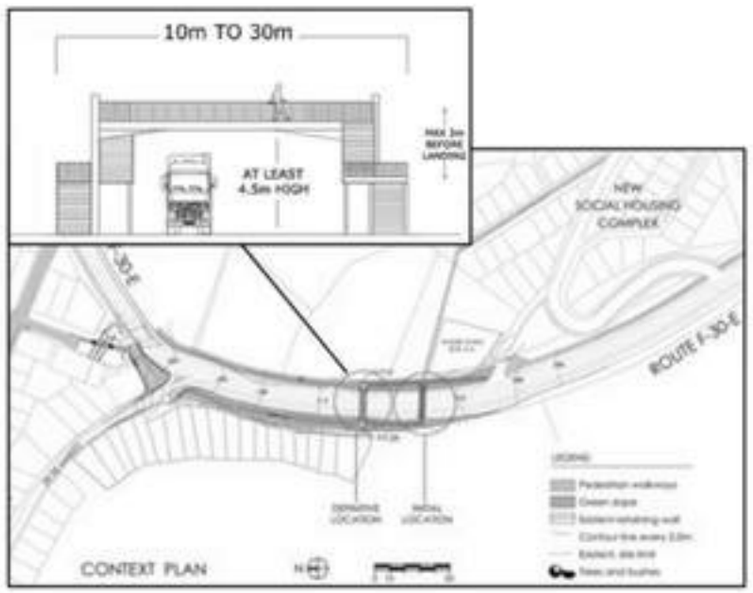
Situational scrutiny





Situational scrutiny



★★★★★ 5-star

★ 1-star





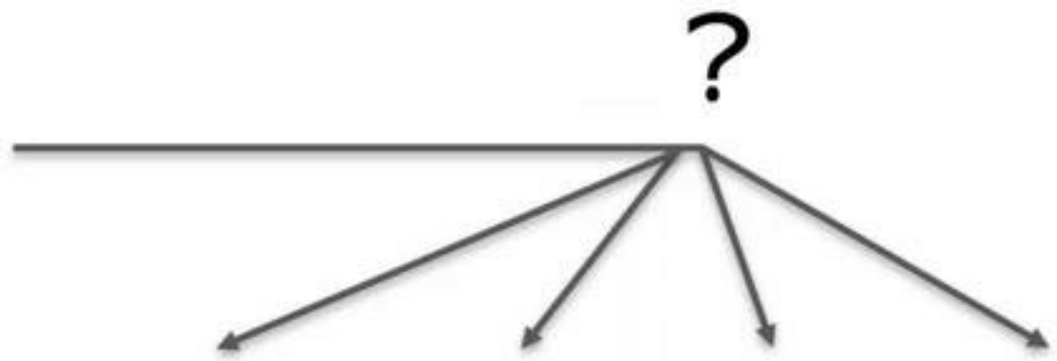










END

Unprotected safety barrier end

Code: 15

Aggressive ends to safety barriers.

Examples are ramped ends, unprotected ends, sharp ends or fish-tail terminals.

This category should also be used to record damaged sections of safety barrier.

METAL

Safety barrier – metal

Code: 1

Metal safety barrier sufficient to restrain most cars and small vehicles (not wire rope safety barrier).

Should be a continuous length of unbroken, undamaged safety barrier.

CONCRETE

Safety barrier – concrete

Code: 2

Concrete safety barrier sufficient to restrain most cars and small vehicles.

Should be a continuous length of unbroken, undamaged safety barrier.

WIRE ROPE

Safety barrier – wire rope

Code: 4

Wire rope safety barrier sufficient to restrain most cars and small vehicles.

Should be a continuous length of unbroken, undamaged safety barrier.

Situational scrutiny

Situational scrutiny

iRAP Coding Options

LINES

Poor

Code: 2

Signing of hazards, or centre and edge markings are generally absent or in poor condition.

LINES

Adequate

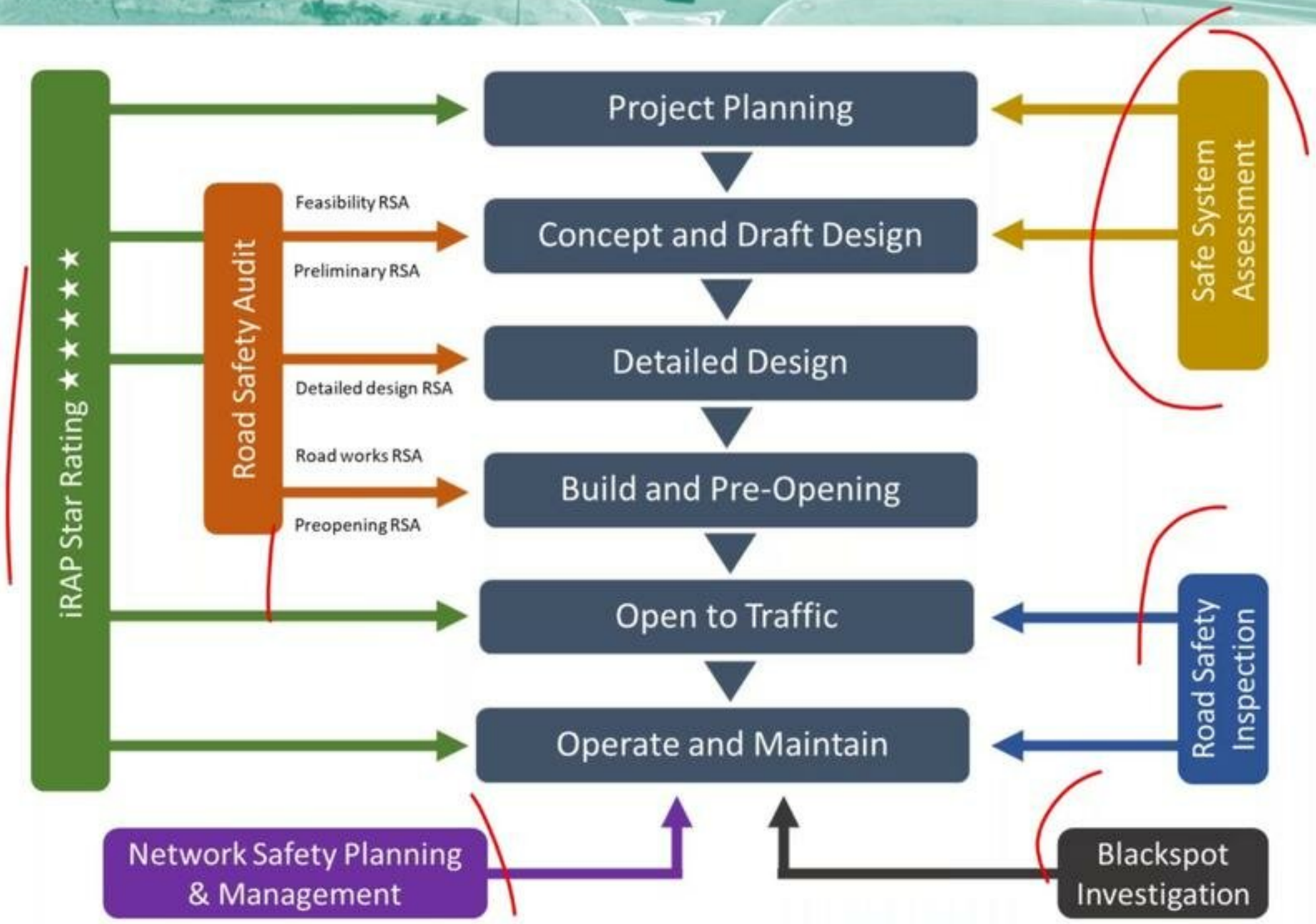
Code: 1

Signs warning of severe hazards, and centre and edge markings are generally present and visible.

LINES

Line marking directs (or misleads) drivers into a hazardous situation

Road Safety Auditor input


iRAP Star Rating ★★★★★
Road Safety Audit
Feasibility RSA
Preliminary RSA
Detailed design RSA
Road works RSA
Preopening RSA
Project Planning
Concept and Draft Design
Detailed Design
Build and Pre-Opening
Open to Traffic
Operate and Maintain
Safe System Assessment
Road Safety Inspection
Network Safety Planning & Management
Blackspot Investigation

Question and Answer Session

Please address your question to the relevant speaker

Speakers: Gabby O'Neill

Mark Ellis

Joseph Le

Kenn Beer

INSTITUTE OF TRANSPORTATION ENGINEERS
AUSTRALIA & NEW ZEALAND SECTION

Look out for your invitation to the ITE-ANZ Annual Breakfast Meeting in February

ITE webinars from North America are now free of charge!
A major benefit of membership.

INSTITUTE OF TRANSPORTATION ENGINEERS
AUSTRALIA & NEW ZEALAND SECTION

Thank you for attending

Stay safe and see you next time!

Attendance at this webinar can be counted as 1.5 hours of CPD