5 October 2020

The Economy and Infrastructure Committee
Parliament of Victoria

Dear Chair and Committee Members

iRAP Submission to Victorian Road Toll Inquiry

iRAP, as a global charity with the vision for a world free of high-risk roads, welcomes the opportunity to provide this submission in support of my appearance at the hearings on Tuesday 6 October.

80,000-100,000 Victorians will be killed and injured in road crashes between now and 2030 based on current trends. Every community and every electorate will share that tragedy. The cost to the Victorian economy, business and families will be more than $50 billion over that period. The solutions are both cost effective and proven and an urgency and scale to our reponse is essential for both the economy and infrastructure.

There are some great AusRAP partnerships already in place in Victoria with DoT, VicRoads, TAC, RACV and ARRB to name a few– but lots more can be done to realise the life-saving potential of improved Star Ratings through safer road infrastructure and safer speeds for all road users.

The global Government to Government and export potential of improving road safety is already being supported with AusRAP and IndiaRAP twinning activities in place that has included VicRoads staff helping establish IndiaRAP and major new initiatives being shaped with Global Victoria. The iRAP Chair globally is Mr Gary Liddle, a major contributor to public service in Victoria.

As one of the Special Advisors to the Federal Inquiry into the National Road Safety Strategy 2011-2020 led by Dr Crozier and Dr Wooley I look forward in helping Victoria return itself to a position of national and global leadership in road safety.

There is no trade-off in investment in road safety. It will **save lives, save money and create jobs** in every corner of the State. I look forward to helping the Government and all the key stakeholders in Victoria make the most of that win-win-win investment for the benefit of all Victorians.

Yours sincerely

Rob McInerney

Contents

Introduction and background https://www.irap.org/

iRAP is a UK registered global charity with the vision for a world free of high-risk roads. The charity provides the global standard for infrastructure safety performance monitoring as recommended by WHO Member States, UN agencies, the International Transport Forum of the OECD, Global Infrastructure Hub, the World Bank, PIARC (the World Road Association), European Investment Bank and other national governments and multi-lateral development agencies. The specifications, systems and supporting software are provided in a free-to-air environment for all partners to use. Global partners contribute to the continuous enhancement and improvement of the programme for the mutual benefit of all partners.

The AusRAP programme in Australia has been active since 2004 and was the first RAP programme outside Europe and started in Victoria. The programme is currently governed by an MOU agreement between the Australian State, Territory and Local Government road agencies represented by Austroads, ARRB, AAA and iRAP. Austroads research has helped underpin the global evidence base used in the models.

Victorian and Australian experts have also helped shape the global programme that now reaches 100+ countries, 1,000,000km+ of roads and has made over $100 billion of road investment safer worldwide from school entrances to major freeways and toll-roads.

Key Recommendations

A summary of key recommendations for the Inquiry to consider:

1. Formally establish an AusRAP leadership team in Victoria (DoT, VicRoads, TAC, RACV, ARRB and others) and build the best AusRAP programme in Australia – and the world!
2. Produce and publish the AusRAP Crash Risk Maps on an annual basis for all roads across the State (refer UK example).
3. Publish existing Star Rating assessments on the state highway network and commit to re-assessments every 3-5 years to monitor performance and set the priorities for the following 5 years (refer EU legislation).
4. Commit to the regular assessment and publication of Star Ratings on state and local government roads where more than 75% of travel occurs for that road user in accordance with the SDG's and UN Global Road Safety Performance Targets. (e.g. publish pedestrian star ratings where 75% of pedestrian travel is; cyclists star ratings where 75% of bike travel is and the same for motorcyclists and vehicle occupants).
5. Require the before and after Star Rating of all new road and transport infrastructure to be reported along with an estimate of the deaths and injuries and associated costs likely over the effective life of the treatment.
6. Set appropriate Star Rating performance targets for all new and upgraded road and transport infrastructure (e.g. 4-star or better for state highways; 4-star or better for pedestrians and cyclists around schools).
7. Development an Investment Plan that optimises the investment in infrastructure solutions and associated speed management activities to reach the Star Rating targets.
8. Spot Star Ratings completed at crash scenes to better inform safe system outcomes and discussions with the community.
9. Build on the globally unique datasets of TAC as a monopoly third-party insurer to shine a spotlight on the true tragedy and cost of injury crashes and the development of enhanced predictive models to optimise public and private-sector investment in results-based financing across the State.
10. Maximise life-saving aid and trade opportunities globally as part of Victorian led AusRAP partnerships with IndiaRAP, IndonesiaRAP, PacificRAP and others.

AusRAP Outputs & Partnerships – Victorian Leadership

The AusRAP Programme began in Victoria in 2004 (the first programme outside of Europe) and has now extended to every State and Territory with an extensive platform of local experience and application by State and Local Government Agencies, Motoring Clubs, Austroads and ARRB. The partnership benefits from, and contributes to, the global iRAP partnerships that are in place in over 100 countries worldwide. Examples of AusRAP partner activity in Australia are provided below.

RACV led assessments of the State network

VicRoads and TAC led assessments of the State network*

** Note: recent before and after assessments have confirmed >50% reductions in severe trauma on many of the roads upgraded as part of the TAC investment – refer TAC for details*

The human impact of road trauma in every region

iRAP believe that a lack of visibility of the true human impact of road crashes has created the apathy and under-investment we have seen to date. Shining a spotlight on the true impact of road trauma has been a focus of the charity, and partnerships with organisations like TAC have enabled that to happen.

The Vaccines for Roads resource has been designed to support this discussion. The TAC data is now being used by iRAP, the World Bank, International Finance Corporation and FIA to drive pension fund and private-sector investment in road safety impact bonds and Impact Investment to save lives worldwide.

The Human Impact in Australia

The Human Impact of Road Injuries every year

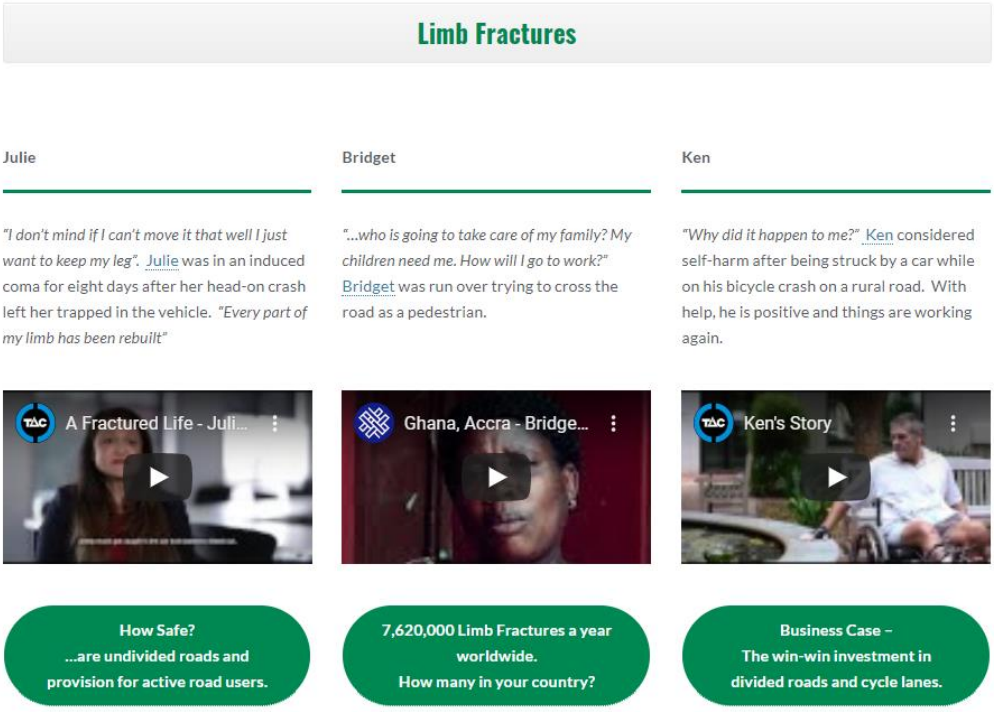
NEW VICTIMS EVERY YEAR	HUMAN IMPACT	NEW COSTS EVERY YEAR
1,351	Lives Lost	$ 4.9 billion
299	Severe Acquired Brain Injury	$ 3.3 billion
5,923	Fractures - Limb	$ 2.1 billion
3,599	Internal Injuries	$ 1.7 billion
2,484	Brain Injury (Mild) / Head Injury	$ 1.3 billion
10,349	Soft Tissue (Neck / Back) / Whiplash	$ 974 million
19	Quadriplegia	$ 599 million
2,632	Fractures - Other	$ 591 million
7,500	Contusion / Abrasion Laceration	$ 341 million
827	Dislocations	$ 307 million
447	Other Spinal	$ 279 million
29	Paraplegia	$ 257 million
3,642	Other Injuries	$ 178 million
321	Degloving	$ 162 million
1,449	Sprains / Strains	$ 109 million
894	Concussion	$ 68 million
43	Amputations	$ 40 million
55	Burns (Severe / Moderate)	$ 16 million
13	Nerve Damage	$ 4 million
5	Lost Of Sight / Eyes	$ 1 million
41,881	**TOTAL**	**$ 17.2 billion**

https://www.vaccinesforroads.org/global-impact-of-injuries/

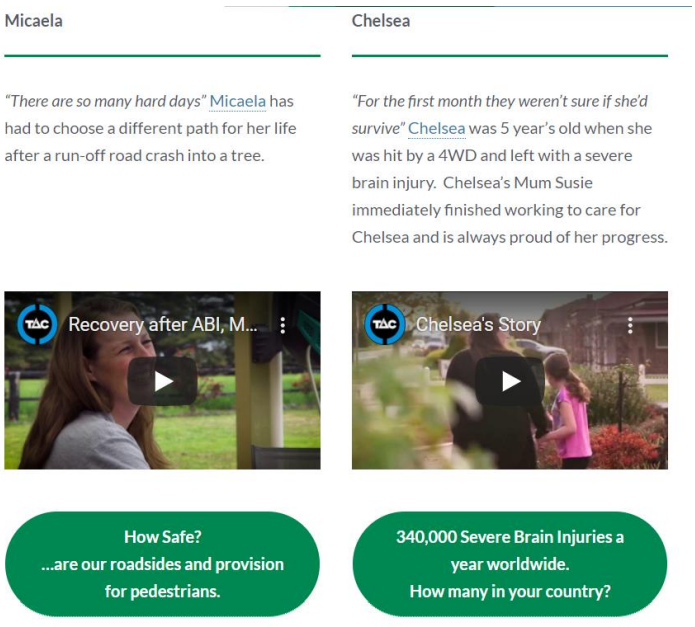
The personal impact of road trauma

The human impact of road trauma is also personal…..Thanks to TAC and other global partners the true personal impact of road trauma has been able to be shared - because every life counts!

https://www.vaccinesforroads.org/human-impact/



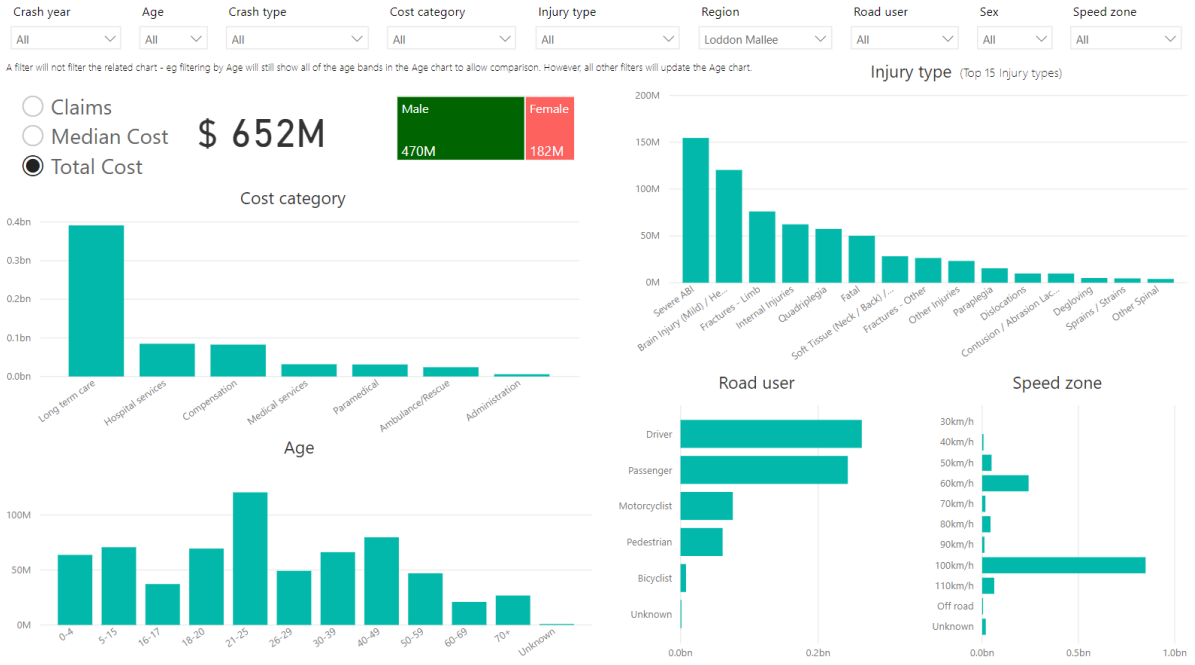
https://www.vaccinesforroads.org/human-impact/



The Impact in Rural and Remote Regions

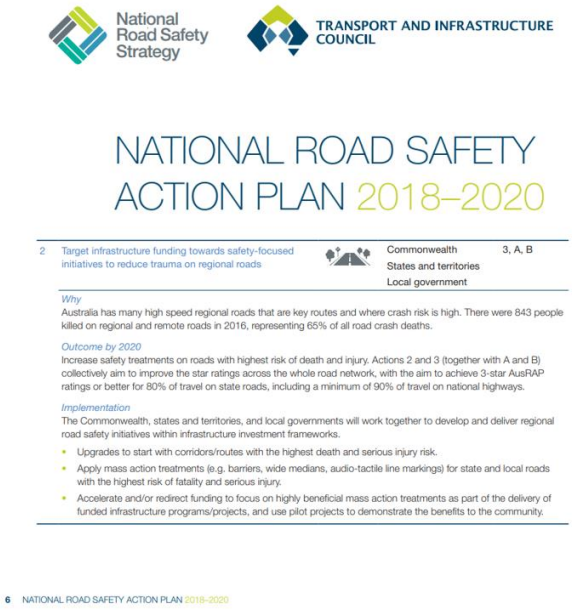
The public version of the TAC iRAP Injury Dashboard allows the human and financial impact of road crashes to be explored by region. The example below shows the rural region of Loddon Mallee and highlights severe brain injuries are the largest costs, more than half of the claim costs happen more than 2 years after the crash as part of long term care of the crash victims and 21-25 year olds are the most impacted. More detailed dashboards linking the AusRAP data and claim costs are used for internal planning and programme management. Refer to TAC for more details.

Total cost of injuries in the Loddon Mallee Region



http://www.tac.vic.gov.au/road-safety/statistics/online-crash-database/irap-road-injury-dashboard

AusRAP - Australian Inspiration



National Road Safety Strategy

TRANSPORT AND INFRASTRUCTURE COUNCIL

NATIONAL ROAD SAFETY ACTION PLAN 2018–2020

2	Target infrastructure funding towards safety-focused initiatives to reduce trauma on regional roads	Commonwealth States and territories Local government	3, A, B

Why

Australia has many high speed regional roads that are key routes and where crash risk is high. There were 843 people killed on regional and remote roads in 2016, representing 65% of all road crash deaths.

Outcome by 2020

Increase safety treatments on roads with highest risk of death and injury. Actions 2 and 3 (together with A and B) collectively aim to improve the star ratings across the whole road network, with the aim to achieve 3-star AusRAP ratings or better for 80% of travel on state roads, including a minimum of 90% of travel on national highways.

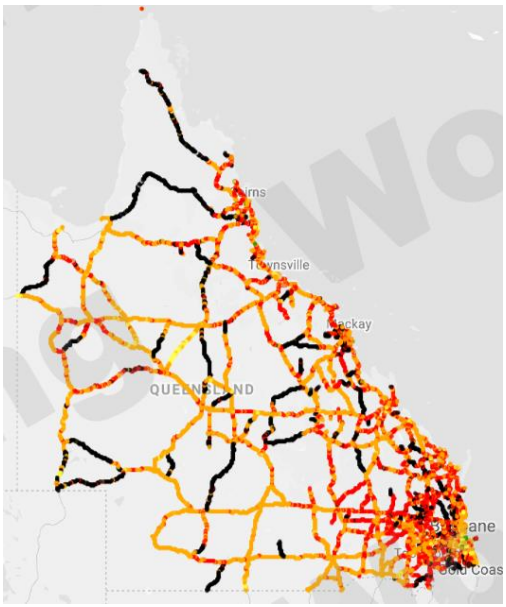
Implementation

The Commonwealth, states and territories, and local governments will work together to develop and deliver regional road safety initiatives within infrastructure investment frameworks.

- Upgrades to start with corridors/routes with the highest death and serious injury risk.
- Apply mass action treatments (e.g. barriers, wide medians, audio-tactile line markings) for state and local roads with the highest risk of fatality and serious injury.
- Accelerate and/or redirect funding to focus on highly beneficial mass action treatments as part of the delivery of funded infrastructure programs/projects, and use pilot projects to demonstrate the benefits to the community.

6 NATIONAL ROAD SAFETY ACTION PLAN 2018–2020

National Star Rating Policy Targets – TIC



Statewide Vehicle Star Ratings – TMR

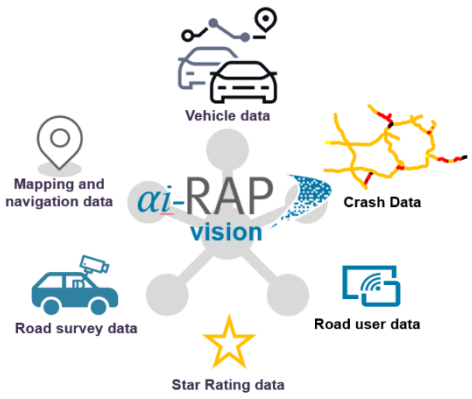
Safer Roads Investment Plan

Currency: $ AUD - Analysis Period: 20 years

Total FSIs Saved	Total PV of Safety Benefits	Estimated Cost	Cost per FSI saved	Program BCR
2,081	1,188,575,999	545,419,964	262,081	2

Countermeasure	Length / Sites	FSIs saved	PV of safety benefit	Estimated Cost	Cost per FSI saved	Program BCR
Skid Resistance (paved road)	350.90 km	465	265,521,877	88,391,771	190,126	3
Roadside barriers - driver side	517.60 km	446	254,859,407	134,110,857	345,353	2
Clear roadside hazards - driver side	1,051.40 km	265	151,258,133	40,177,539	151,704	4
Clear roadside hazards - passenger side	1,005.90 km	233	133,210,581	38,213,379	163,835	3
Roadside barriers - passenger side	331.10 km	231	131,838,019	100,211,814	434,120	1
Central median barrier (no duplication)	10.80 km	72	41,337,727	6,739,287	93,110	6
Central hatching	159.60 km	65	36,935,005	20,933,486	323,694	2
Shoulder rumble strips	125.30 km	46	26,331,870	18,600,522	403,436	1
Central median barrier (1+1)	15.10 km	46	26,131,740	16,679,034	364,530	2
Traffic calming	47.50 km	45	25,788,313	12,219,586	270,601	2
Protected turn lane (unsignalised 4 leg)	72 sites	36	20,596,835	6,425,992	178,185	3
Improve Delineation	156.50 km	34	19,628,995	7,516,729	218,707	3
Footpath provision driver side (adjacent to road)	48.20 km	18	10,104,789	6,506,884	367,770	2

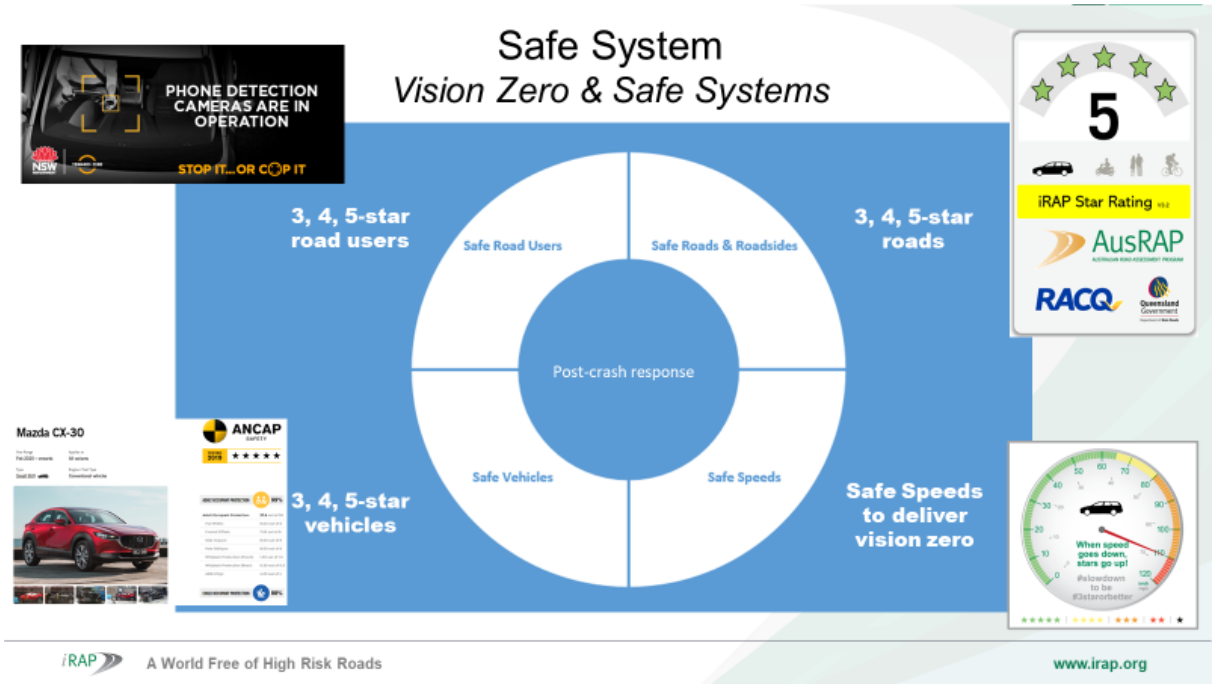
Safer Roads Investment Plans



Global first Ai-RAP Partnership to use big data and artificial intelligence to generate low-cost, scalable RAP data underway with MRWA, Transport for NSW and the iMove CRC will support AusRAP KPI measures

https://www.midlandhighway.tas.gov.au/about_the_action_plan

Safe System Opportunities – 5-star users on 5-star roads in 5-star vehicles

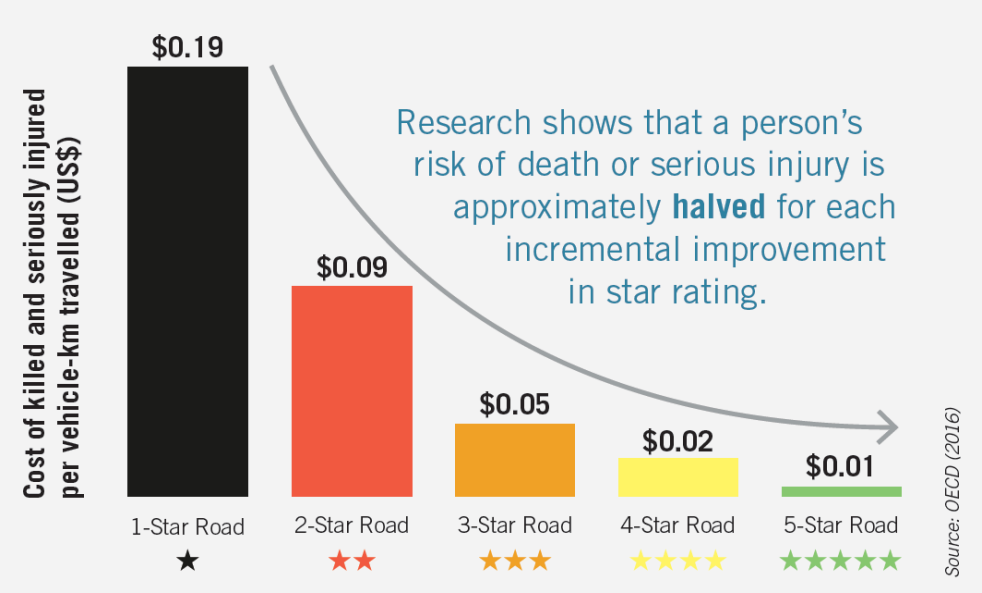


iRAP and Inspiration from the world

https://www.vaccinesforroads.org/case-studies-of-success/

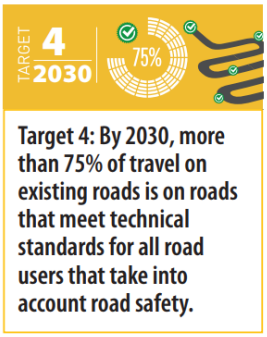
OECD

The relationship between Star Ratings and crash costs per kilometre travelled



https://www.oecd.org/publications/zero-road-deaths-and-serious-injuries-9789282108055-en.htm

UN agreed minimum Star Rating Standards for new and existing roads



Member State agreed Global Road Safety Performance Targets

https://www.who.int/roadsafety/publications/en/

Global Innovation

Within the safe system context iRAP is working with the European Union and other partners to ensure the combined performance of new driver assistance technologies, vehicle safety standards, road design standards and technology / ITS deployment are implemented to minimise the occurrence of death and injury. For further details see https://eurorap.org/slain-project/.

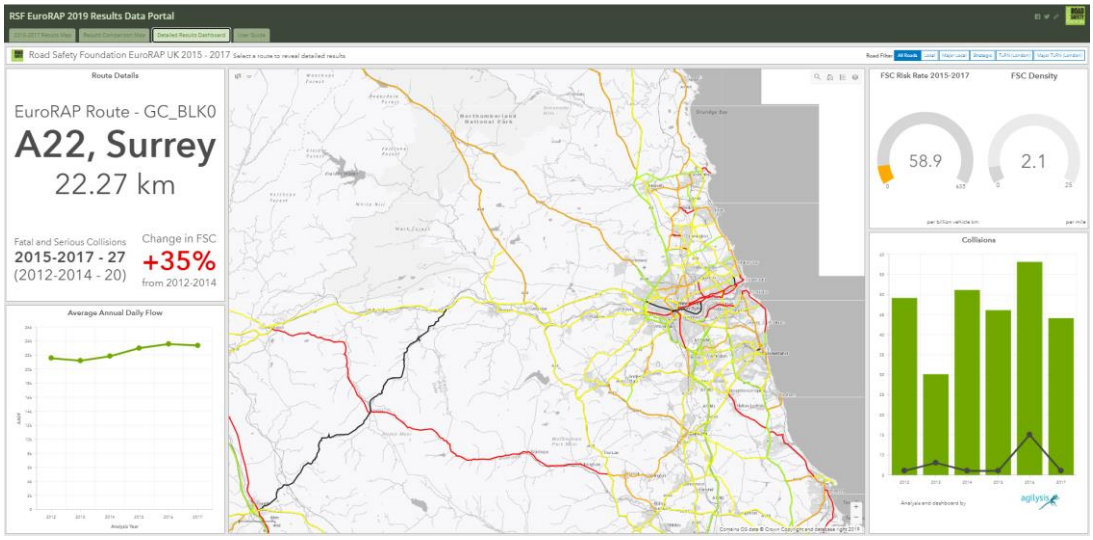
A range of Global Innovation partnerships are also underway – including world leading work on Safe System Star Ratings with VicRoads and Melbourne-based Safe System Solutions. https://www.irap.org/2017/12/event-snapshot-innovation-2017/.

Annual Risk Maps and Performance Tracking

Ready examples of the annual risk mapping approach are available from countries like the UK and Spain and highlight the potential of this approach to support transparent performance tracking. This can ensure success can be celebrated when high -risk roads become low-risk – and also to continuously target any persistently high-risk roads.

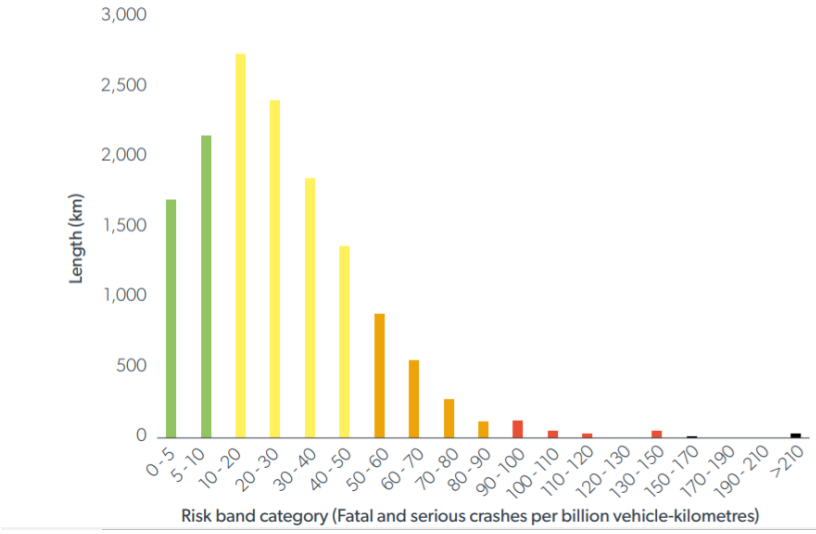
Refer to the following overseas examples for more information:

- https://roadsafetyfoundation.org/project/how-safe-are-you-on-britains-main-road-networks-eurorap-results-2019/
- https://eurorap.org/wp-content/uploads/2020/01/20170608-5-EuroRAP-in-Spain-L-Puerto.pdf
- http://www.kiwirap.org.nz/risk_maps.html



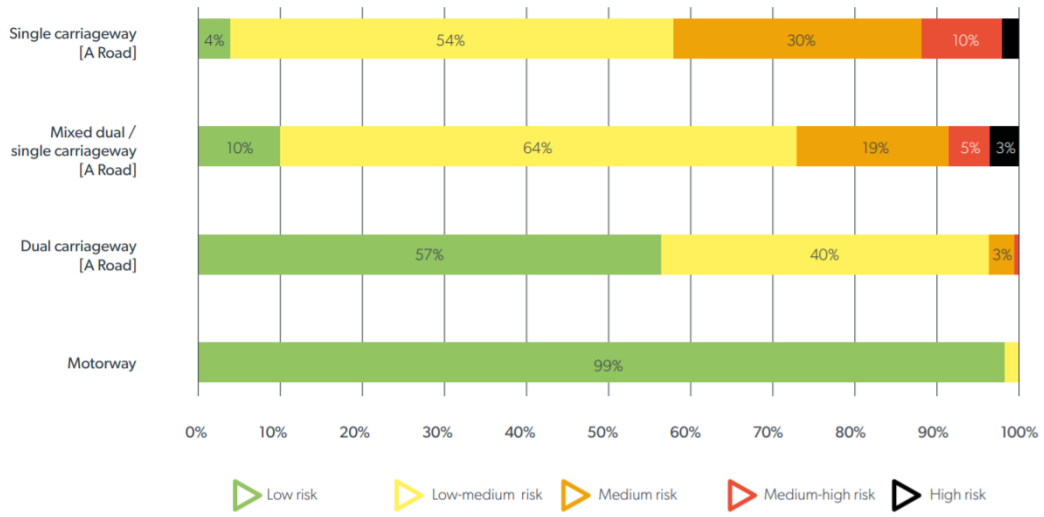
EuroRAP UK Risk Mapping Dashboard

FIGURE 1: RISK RATE DISTRIBUTION FOR ENGLISH SRN AND MRN COMBINED (TOP), SCOTTISH STRATEGIC ROADS (MIDDLE) AND WELSH STRATEGIC ROADS (BOTTOM)[7]



Risk Distribution per billion kilometre travelled (UK)

FIGURE 3: PERCENTAGE OF TRAVEL ON SECTIONS WITH HIGH-LOW RISK BANDINGS BY ROAD TYPE

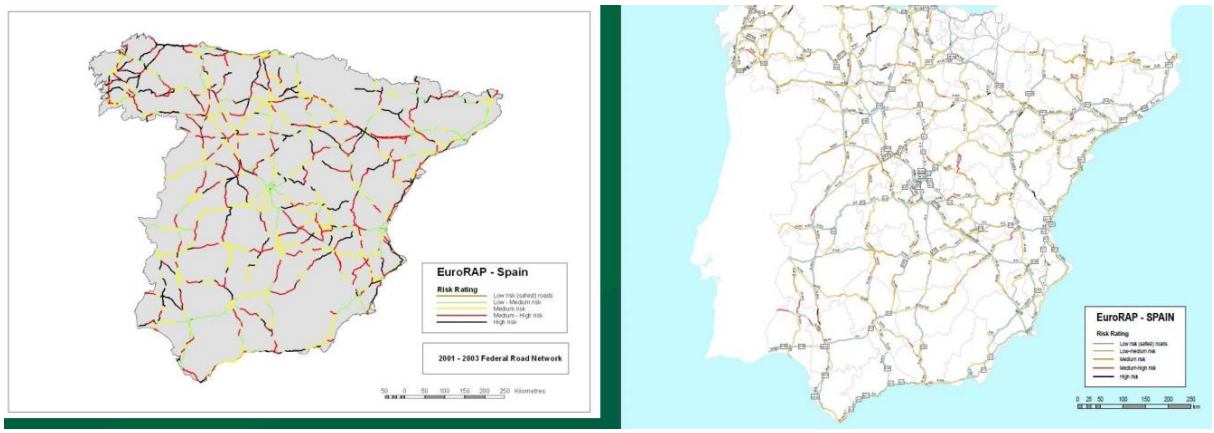


% of travel on low to high crash rates by road type (UK)

Table 1: Most improved road links

Site Name	Region	07-11 Crashes					12-16 Crashes					Difference in F+S
		Fatal	Serious	F+S	Collective Risk Band	Personal Risk Band	Fatal	Serious	F+S	Collective Risk Band	Personal Risk Band	
SH 1 from Kaikoura to Waipara	Canterbury	5	46	51	Medium	Medium-High	7	23	30	Low-Medium	Low-Medium	-21
SH 77 from Ashburton to Darfield	Canterbury	6	21	27	Low-Medium	High	1	5	6	Low	Low	-21
SH 2 from Takapau to Hastings	Hawke's Bay/ Manawatu-Whanganui	10	29	39	Medium-High	Medium	6	13	19	Low-Medium	Low	-20
SH 2 from Featherston to Upper Hutt	Wellington	2	32	34	High	High	3	13	16	Medium-High	Medium	-18
SH 2 from Takapau to Woodville	Manawatu-Whanganui	6	20	26	Medium	Medium	1	10	11	Low-Medium	Low	-15
SH 1 from Timaru to Oamaru	Canterbury/Otago	10	20	30	Medium	Low-Medium	6	9	15	Low-Medium	Low	-15
SH 1 from Warkworth to Wellsford	Auckland	9	17	26	High	Medium-High	2	11	13	Medium-High	Low-Medium	-13

Performance Tracking (KiwiRAP)



Spanish Risk Maps – the improvement from 2004 – 2014

Star Rating for Schools

If we can make a road safe for a child it is safe for everyone.

Together with global partners like FIA Foundation, FedEx, 3M, UNICEF, FIA clubs like RACV and others, iRAP is supporting the global application of Star Rating for Schools.

https://www.starratingforschools.org/

NEW SR4S CASE STUDY: TRAX India

Aug 25, 2020

SR4S CASE STUDY: TRAX INDIA Road Safety & Juniors - Paving the way for a safer tomorrow Government of Haryana, MG Motor and TRAX are developing a safer culture around schools through road upgrades, research and training involving students, teachers and the...

read more

SR4S newsletter now available – July 2020 Edition

Jul 31, 2020

The latest Star Rating for Schools newsletter is out now - read some great stories of how SR4S Lead Partners are engaging partners and leading safer infrastructures around the world. This edition features: Reshaping spaces for pedestrians now and after COVID-19...

read more

YOURS is leading the youth to improve road safety globally

Jul 27, 2020

The Global Youth Coalition for Road Safety, initiated by YOURS, has been launched, opening a path for global youth engagement on road safety actions. During an online ceremony held in July 2020, the young leaders to be part of the Youth Advisory Board have been...

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AIP Foundation scales up success of school zone upgrades in HCMC and Pleiku City

Jul 27, 2020

Following on from the success of the four school zones upgraded in Ho Chi Minh City as part of the Walk This Way programme, and the two school zones improved in Pleiku City through the Slow Zones, Safe Zones programme, both supported by SR4S, the AIP Foundation is now...

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Gonzalo Rodriguez Foundation engages governments on the road safety agenda through webinar series

Jul 27, 2020

Given the circumstances of COVD19 experienced around the world, the Gonzalo Rodríguez Foundation launched a cycle of webinars on different aspects of children's road safety. One of these webinars, 'Entornos Escolares Seguros (Safe School Environments)' featured the...

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Thiago Gonzaga Foundation engages youth on the road safety agenda

Jul 27, 2020

Thiago Gonzaga Foundation (Vida Urgente), Global Alliance member, has been working to engage the youth on the road safety agenda. Volunteers from Vida Urgente attended the SR4S webinar delivered in April 2020 and have been trained on the SR4S methodology, getting...

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Australian International Partnerships

iRAP is already actively supporting the Global Infrastructure Hub and also DFAT with positive economic, aid and trade related activities including but not limited to:

- The G20 Quality Infrastructure guidance
- The Australia-India Infrastructure Council
- Road infrastructure safety in Vietnam
- AusRAP and IndiaRAP twinning partnerships

This could be actively expanded with PacificRAP and AusRAP partnerships to deliver 3-star and better roads across the Pacific; Integrating the IndonesiaRAP development in Indonesia with the KIAT activities and the IndiaRAP and AusRAP twinning expansion for industry level cooperation and partnerships.

Appendix A: Road Infrastructure Key Performance Indicators using the iRAP Global Standard

The following pages outline the global Safer Roads / Road Infrastructure KPIs recommended for use globally as part of the iRAP Global Standard and the UN Global Road Safety Performance Targets. This work is informing target and KPI setting across Europe and worldwide through the Regional Road Safety Observatories in Latin America, Africa and Asia. Global alignment on these KPIs will also ensure Ai-RAP initiatives to ensure big-data approaches to streamline data collection is immediately available for all partners to benefit from in Victoria and Australia-wide.

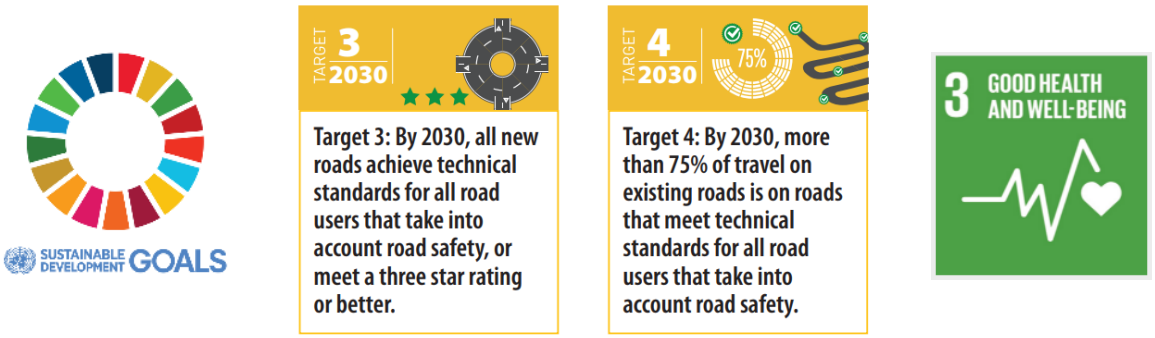
The approach will also allow simple benchmarking with other countries (e.g. performance of Australian motorways versus French, Spanish and UK Motorways; pedestrian star ratings in inner CBD areas comparing Stockholm versus Melbourne) or internally comparing Princes Highway East versus west for vehicles and Bendigo versus Sale versus Torquay for pedestrians and cyclists).

Road Infrastructure Key Performance Indicators using the iRAP Global Standard

Harmonisation of road safety data is a major focus of all stakeholders across the world. This includes fatality and injury data; road infrastructure performance data; vehicle performance data; road user behaviour data; and post-crash response data.

The recommended road infrastructure Key Performance Indicators (KPI's) will ensure harmonised collection of data in support of the following:

- the United Nations Sustainable Development Goals
- the 12 Global Road Safety Performance Targets agreed by Member States;
- the EU RISM Directive;
- the Regional Road Safety Observatories;
- WHO Global Status Report on Road Safety;
- the Sum4All initiative; and
- policies and strategies set by Governments, development organisations, donors and NGOs worldwide.



Member State agreed Global Road Safety Performance Targets

https://www.who.int/roadsafety/publications/en/

About iRAP

iRAP is a registered charity. The iRAP specifications, methodologies and software provide the global standard with all resources published in the public domain for free use by partners globally (https://www.irap.org/resources/). The iRAP methodologies are overseen by an independent Global Policy Advisory Committee and Global Technical Committee, and are supported with training courses and an accreditation scheme for partners and suppliers worldwide.

The iRAP Global Standard

iRAP methodologies have been applied by partners in more than 100 countries across more than 1 million kilometres of road. These safety assessments are informing more than US$75 billion of road investment and provide harmonised road infrastructure KPI's for the mutual benefit of all stakeholders worldwide. Local ownership and application of the iRAP Global Standard is encouraged and supported in every country. To date, more than 25,000 people have participated in training, workshops and presentations on iRAP content.

The global iRAP standard provides numerous benefits including:

- an objective, evidence-based approach to assessing infrastructure related risk that all jurisdictions and stakeholders can access;
- a way to benchmark performance between jurisdictions and road classes;
- a mechanism to fast-track safety assessments through innovative initiatives such as linkages to road asset data; Ai-RAP and the light data methodology; and
- alignment with the UN, WHO, EU, PIARC and multi-lateral development bank policies and recommendations.

Achieving UN Targets 3 and 4 by 2030 will mean

To understand what achieving the KPIs would mean for your country, see iRAP's Business Case for Safer Roads.

For more information

- To learn more about IRAP and its global programmes and activities, visit irap.org
- To apply the Step by Step Approach to Safer Roads with the KPIs providing the confidence to invest and the metrics to measure success, visit vaccinesforroads.org/take-action/
- To understand the human impact of road crashes, how safe the world's roads are and what is possible for your country – in terms of fatal and serious injuries prevented and economic savings that could be achieved by maximising the percentage of travel on 3-star or better roads by 2030 - explore iRAP's Big Data Tool at vaccinesforroads.org
- To learn about or establish an iRAP programme in your country or state, contact your local representative by visiting the where we work map at irap.org/about-us/
- For details on iRAP's protocols and how to apply them to your infrastructure projects, visit irap.org/how-we-can-help/
- For training to support achieving the KPIs, visit irap.org/training/

GLOBAL ROAD INFRASTRUCTURE KEY PERFORMANCE INDICATORS (KPI'S) – EXISTING ROADS

Crash Data

iRAP Global Standard	Protocol / Attribute	Primary KPI	Current Global Performance	2030 Target	**Extended Metrics** (with primary performance measure **in bold**)
Crash Risk Mapping	Collective Crash Risk Maps	Percentage of road length with < XXX fatal and serious crashes per kilometre per year		To be set by jurisdiction	% in each category (**low, low-medium**, medium, medium-high and high risk)
Crash Risk Mapping	Individual Crash Risk Maps	Percentage of road length with < XXX fatal and serious crashes per billion vehicle kilometres travelled		To be set by jurisdiction	% in each category (**low, low-medium**, medium, medium-high and high risk)

Infrastructure and Speed Management for existing roads (Global Road Safety Performance Target 4)

iRAP Global Standard	Protocol / Attribute	**Primary KPI** (Refer https://www.vaccinesforroads.org/ for sample of global and national performance)	Current Global Performance	2030 Target	**Extended Metrics** (with primary performance measure **in bold**)
Star Rating	Pedestrian Star Rating	Percentage of travel on 3-star or better roads for pedestrians	12 %	>75%	% of length and % of travel in each category (**5-star, 4-star, 3-star,** 2-star, 1-star)
Star Rating	Bicyclist Star Rating	Percentage of travel on 3-star or better roads for cyclists	14 %	>75%	% of length and % of travel in each category (**5-star, 4-star, 3-star,** 2-star, 1-star)
Star Rating	Motorcyclist Star Rating	Percentage of travel on 3-star or better roads for motorcyclists	33 %	>75%	% of length and % of travel in each category (**5-star, 4-star, 3-star,** 2-star, 1-star)
Star Rating	Vehicle Occupant Star Rating	Percentage of travel on 3-star or better roads for vehicle occupants	56 %	>75%	% of length and % of travel in each category (**5-star, 4-star, 3-star,** 2-star, 1-star)

INFRASTRUCTURE ATTRIBUTE PERFORMANCE KPIS – BY ROAD LENGTH*

iRAP Global Standard	Protocol / Attribute	**Primary KPI** (Refer https://www.vaccinesforroads.org/ for sample of global and national performance)	Current Global Performance	2030 Target
iRAP Coding Manual	Sidewalk; Operating Speed	Percentage of roads where pedestrians are present and traffic flows at 40km/h (25mph) or more **have formal footpaths or sidewalks**	15%	To be set by jurisdictions
iRAP Coding Manual	Pedestrian crossing – inspected road; Operating Speed	Percentage of roads where pedestrians cross and traffic flows at 40km/h (25mph) or more **have pedestrian crossing facilities**	8%	
iRAP Coding Manual	Pedestrian crossing quality; Operating Speed	Percentage of pedestrian crossings that **are adequately signed or maintained**	88%	
iRAP Coding Manual	Facilities for motorised two wheelers; Operating Speed	Percentage of roads where motorcyclists are present and traffic flows at 60km/h (40mph) or more **have dedicated motorcycle facilities**	1%	
iRAP Coding Manual	Bicycle facility; Operating Speed	Percentage of roads where bicyclists are present and traffic flows at 40km/h (25mph) or more have **dedicated bicycle facilities**	9%	
iRAP Coding Manual	Median Type; Operating Speed	Percentage of roads where traffic flows at 80km/h (50mph) or more **have divided carriageways**	19%	
iRAP Coding Manual	Roadside severity (object & distance); Operating Speed	Percentage of roads where traffic flows at 80km/h (50mph) or more **have low-risk roadsides**	21%	
iRAP Coding Manual	Curvature; Operating Speed	Percentage of roads where traffic flows at 80km/h (50mph) or more **do not have sharp curves**	97%	
iRAP Coding Manual	Intersection Type; Operating Speed	Percentage of intersections where traffic flows at 60km/h (40mph) or more **have turning provision**	27%	
iRAP Coding Manual	Intersection Type; Operating Speed	Percentage of railway crossings where traffic flows at 60km/h (40mph) or more **have active protection**	47%	
iRAP Coding Manual	Number of lanes; Operating Speed	Percentage of roads where traffic flows at 80km/h (50mph) or more **have dedicated overtaking provision**	35%	
Star Rating for Schools	Pedestrian Star Rating	Percentage of school star rating data points that are **3-star or better for children**	? %	

* potential to present by % of travel where volume data is available and reliable.

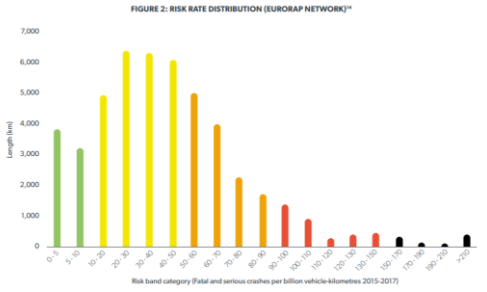
GLOBAL ROAD INFRASTRUCTURE KEY PERFORMANCE INDICATORS – NEW AND UPGRADED ROADS

Infrastructure and Speed Management for New and Upgraded Roads (Global Road Safety Performance Target 3)

iRAP Global Standard	Protocol / Attribute	**Primary KPI** (Refer https://www.vaccinesforroads.org/ for sample of global and national performance)	Current Global Performance*	2030 Target	**Extended Metrics** (with primary performance measure **in bold**)
Star Rating	Pedestrian Star Rating	**Percentage** of travel on new or upgraded roads that are 3-star or better roads for pedestrians	? %	100%	% of length and % of travel in each category (**5-star, 4-star, 3-star,** 2-star, 1-star)
Star Rating	Bicyclist Star Rating	**Percentage** of travel on new or upgraded roads that are 3-star or better roads for cyclists	? %	100%	% of length and % of travel in each category (**5-star, 4-star, 3-star,** 2-star, 1-star)
Star Rating	Motorcyclist Star Rating	**Percentage** of travel on new or upgraded roads that are 3-star or better roads for motorcyclists	? %	100%	% of length and % of travel in each category (**5-star, 4-star, 3-star,** 2-star, 1-star)
Star Rating	Vehicle Occupant Star Rating	**Percentage** of travel on new or upgraded roads that are 3-star or better roads for vehicle occupants	? %	100%	% of length and % of travel in each category (**5-star, 4-star, 3-star,** 2-star, 1-star)

* Regular measurement of existing road networks (e.g. every 5 years as legislated in Europe) will provide an opportunity to measure progress; World Bank GRSF is currently undertaking a worldwide project measuring progress; The recently launched Star Rating for Designs tool supports performance tracking.

Risk Mapping Examples

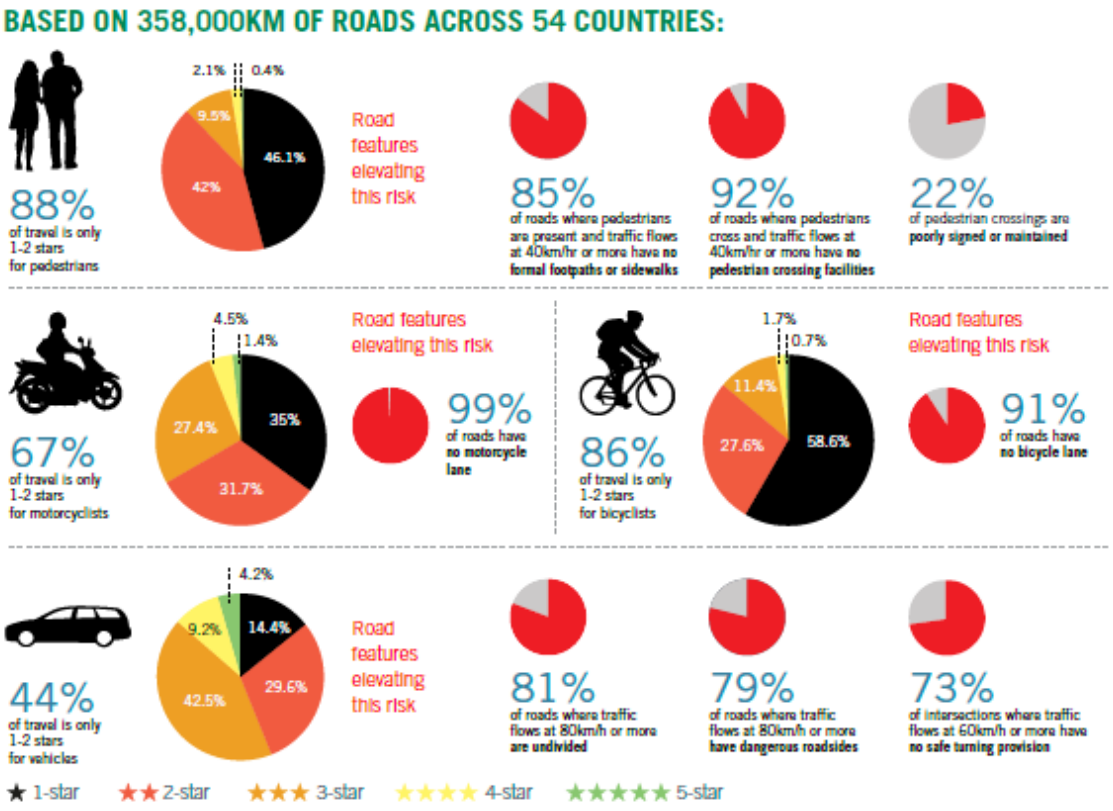


[EuroRAP UK Risk Mapping]

Period		High	Medium-High	Medium	Low-Medium	Low	Total
2002-2006	Percentage	29%	12%	22%	18%	20%	100%
	Length (km)	339	136	254	217	233	1,179
2007-2011	Percentage	10%	22%	28%	25%	15%	100%
	Length (km)	118	270	332	306	178	1,204

[KiwiRAP Risk Mapping]

Star Rating and iRAP Attribute Data Examples



[vaccinesforroads.org/how-safe-are-the-worlds-roads/]