# ACRS Policy Position Statement Infrastructure Star Ratings for Roads

#### Summary

ROAD SAFE

Star ratings of roads and streets provide a consistent measure of road infrastructure safety, enabling the monitoring of road safety strategies and programs. They also empower users with valuable information to inform travel choices and advocate for improvements. The International Road Assessment Programme (iRAP), a UK registered global charity, has developed a star rating system for assessing road infrastructure safety and informing investment decisions. However, several challenges such as limited public awareness, insufficient investment, lack of data transparency and a historical focus only on the vehicle occupant star rating have hindered their full potential.

The iRAP star rating process proactively evaluates the inherent safety of road infrastructure for all road user groups: pedestrians, cyclists, motorcyclists and vehicle occupants. A 3-star or better rating has been adopted by the UN and WHO for all new road designs and for 75% of travel on existing roads for each road user group as a global benchmark for infrastructure safety performance and investment prioritisation.

## **Key policy positions**

- 1. Advocate for the widespread adoption of star ratings as a tool for decision-making and resource allocation, optimising road investment plans for maximum safety benefits.
- 2. Work with governments, industry, international partners and community groups to promote the understanding of both benefits and limitations of star ratings.
- 3. Ensure the regular publication of star rating data for all road users, including before-and-after comparisons and crash risk mapping, for increased transparency and public awareness.
- 4. Develop and implement national targets using star ratings for all road users that integrates with Movement and Place concepts.
- 5. Work towards a long-term vision of a road network where all travel occurs on 3-star or better roads by 2050, with higher targets for 4 and 5-star performance in high-demand areas.
- 6. Advocate for increased and transparent results-based investment in road safety improvements to meet the 2030 star rating targets.
- 7. Empower road users to make safer route and mode choices by integrating star ratings and risk maps into satellite navigation systems.
- 8. Advocate for the application of the fit-for-purpose RAP methods (e.g. AiRAP, Network Screening Tools and LG Stars) at a strategic network level, especially for local roads.
- 9. Recognise, certify and celebrate high performing roads that have improved the star rating to 3-star or better for all relevant road users.

This policy position statement was developed by ACRS members including: Dr Aut Karndacharuk, Rob McInerney, Lauchlan McIntosh, David Beck, Prof Em Raphael Grzebieta, Keith Simmons, Alan Rushworth and Dr Tracy Cheffins.

## Date adopted: May 2025

# Policy problem

ROAD SAFETY

A key challenge in improving road safety and striving for zero road trauma lies in effectively identifying and addressing high-risk road infrastructure. Star ratings provide a valuable framework for assessing road safety performance and improving road safety outcomes. While infrastructure star ratings have been adopted globally, several challenges hinder their full potential.

Firstly, there is currently a lack of widespread recognition and acceptance by the community, including decision-makers. A high-quality, globally recognised, consistent and relatively simple star rating system can highlight that some roads are safer than others, that infrastructure safety needs are different for each road user type, differentiating between infrastructure improvement options. This can foster public demand for effective road safety improvements.

Secondly, insufficient investment and a lack of results-based financing to date, restrict progress in upgrading high-risk infrastructure. iRAP estimates the elimination of high-risk roads for all road users would yield significant annual economic benefits and strong cost-benefit ratios [1]. Many jurisdictions also struggle with inadequate funding for the on-going collection and analysis of safety risk data across their network of main roads. This misalignment between the business case for safer roads, proactive risk assessment and funding prioritisation impedes progress towards zero road trauma.

Thirdly, the historic lack of publication of star rating data has resulted in limited public understanding of infrastructure safety and hindered accountability and effective decision-making. It is essential to ensure comprehensive reporting that includes data for all road users and before-and-after comparisons for all major road upgrades to demonstrate the value of safer road infrastructure investments. Additionally, annual publication of Risk Maps, which highlight fatal and serious injury (FSI) crash rates, can help identify where road investment is needed and the scale of that investment, complementing traditional Black Spot programs and enabling the broader road safety actions.

Increased transparency can hold decision-makers accountable and prioritise road safety improvements that improve the star rating and maximise lives saved per dollar invested. Additionally, data transparency can enable objective criteria for road improvements, ensuring that funding allocation and policy decisions are driven by public safety concerns rather than political interests. Risks associated with organisation reputation, political implications and legal liability cannot be underestimated and need to be properly managed as part of any publication strategy.

Integrating star ratings into the Movement and Place concept [2] by placing a particular emphasis on achieving higher star ratings for vulnerable road users in areas of high place value can contribute to reducing trauma and enhancing placemaking outcomes. Safer Road Investment Plans [3], supported by star ratings, detail the business case for road infrastructure upgrades for all road user groups. These plans outline specific improvements like pedestrian crossings, footpaths, traffic calming measures, cycle lanes, roundabouts, and roadside barriers (with motorcycle friendly barriers where needed), and help road agencies optimise investments and inform speed management. However, the details of these plans are often not publicly available. Demonstrating the return on investment for various road safety improvements will garner public, political and Treasury support for investments needed to meet national road safety targets.

Lastly, the lack of inclusion of road safety performance in navigation systems typically results in travel being directed via the fastest routes that can often be the highest risk. iRAP is working at the global level with

companies to integrate star ratings into navigation systems, enabling users to choose safer routes and transport modes [4]. For this to be successful, the scale and frequency of data collection and publication must be sufficient to meet end-user needs with both AI and light star rating approaches being developed to support this. By providing clear guidance on the benefits of traveling on higher-rated roads and making star rating data readily accessible, road users, including fleet managers and logistic planners, can make informed decision about route choices, and, in turn, reduce the burden of FSI crashes on the community and insurance schemes.

## **Principles underpinning ACRS position**

ROAD SAFETY

- Road fatalities and serious injuries are unacceptable and preventable.
- Road safety measures should be evidence-based and data-driven.
- A robust correlation between improved star ratings and reduced road trauma is well-established.
- Infrastructure design and investment should prioritise safety for all road users.
- Collaboration and partnership between governments, transport agencies, private-sector road owners, navigation providers, businesses and the community is essential for improving road safety.

#### **Evidence base**

A comprehensive assessment of road safety and crash risk is fundamental in the planning and investment of safe road infrastructure. The iRAP star rating methodology has been freely available for over 20 years and is used worldwide by over 125 countries.

Adopted by the United Nations, World Bank and national governments globally, the full range of iRAP tools support optimised investment in safer roads through a consistent and proactive framework for assessing and managing road infrastructure safety. Governed by an independent Global Technical Committee, the models undergo rigorous technical oversight [5]. Global innovation and research initiatives aimed at improving road safety outcomes, leveraging iRAP models, are shared globally for the mutual benefit of all RAP partners including AusRAP and KiwiRAP [6].

#### Proactive Risk Assessment of Road Infrastructure Safety

The safety performance of a road network has predominantly been measured retrospectively using crash and casualty data but star ratings provide a proactive approach. The iRAP star rating process evaluates the inherent safety of road infrastructure to road users (i.e. vehicle occupants, motorcyclists, cyclists and pedestrians) by considering up to 78 distinct road environment attributes, including road geometry, intersection design, roadside hazard protection, signage, vulnerable road user facilities, speed, land use, pavement conditions and traffic characteristics [7, 8]. This analysis results in a Star Rating Score on a scale of 1 to 5 stars, with 1-star the least safe and 5-stars the safest [9].

In addition to star ratings, iRAP provides other related tools to manage infrastructure risk and investment, such as crash risk mapping, fatal and serious injury estimates and investment plans [10]. Additionally, other risk assessment methods such as Safe System assessments, road safety audits and other infrastructure risk ratings can complement star ratings in improving road safety.

#### A Benchmark for Infrastructure Safety Performance and Investment Prioritisation

As part of their commitment to meeting the Sustainable Development Goals [11], United Nations Member States have agreed that all new roads should meet the 3-star or better global standard for all road users

(Target 3), and existing roads should be upgraded to ensure at least 75% of travel for each road user meets the 3-star or better rating, or equivalent, by 2030 (Target 4) [12]. A global initiative, pledging to achieve these targets for 3-star or better roads by 2030 for all road users, is underway to significantly reduce road trauma [13]. Many national governments have already adopted these targets and are mobilising investment to meet the 2030 goals [14].

While there is often a focus on national highways, with approximately half of FSI crashes occurring on local roads, there is a pressing need to extend assessments to regional and local roads, particularly those with high volumes of pedestrian, cyclist, motorcyclist and/or vehicle volumes. This expansion will necessitate a more nuanced approach to evaluating risk on high-volume roads, considering the needs of vulnerable road users in particular. As a result, reporting and communications will need to be adapted to reflect the individual needs and star rating performance for each road user group. Many established global examples can inform an approach in particular countries [15].

Where cost and resources are limited, fit-for-purpose tools such as the AiRAP initiative leverages emerging technologies and data sources (e.g. artificial intelligence, machine learning, vision, LIDAR and telematics) to automate data collection and analysis, enabling a repeatable and scalable approach [16]. A simplified 'light' star rating methodology has also been developed, using a reduced set of attributes to produce statistically valid star ratings [17]. Additionally, alternative tools with similar methodologies have been developed for specific settings such as assessing the safety of local government roads [18, 19, 20].

#### Data-Driven Collaboration for Transparency and Accountability

ROAD SAFETY

Realising a world free of high-risk roads requires a collaborative effort and commitment from all levels of government to support implementation, monitoring and oversight. This can be achieved through leveraging available resources and tools, fostering strong collaboration among key stakeholders and supporting the development of effective Communities of Practice to share knowledge and best practices.

Publication of star ratings with a national compilation of results from all states and territories is essential. Highlighting successful case studies will maximise the effectiveness of the star rating programs, and ensure accountability for infrastructure improvements. Systematic and frequent publication of Individual and Collective crash risk maps can enable informed decision-making about road improvement and investment priorities, maximising lives saved per dollar invested. For example, a 1-star road with high collective crash risk will warrant more urgent attention compared to a 1-star road where the individual or collective crash risk is lower.

This will drive broader adoption of star ratings for all road users across road and street networks, empowering communities to advocate for improved infrastructure and holding decision-makers accountable for delivering quality outcomes and safe, reliable and sustainable mobility.

#### **Recommended policy actions**

- Infrastructure star ratings to be implemented as a tool for decision-making and resource allocation to meet or exceed UN Global Target for 75% of travel for each individual road user group on 3-star or better roads by 2030.
- 2. Timely reporting of before-and-after star ratings for all road user groups as part of all major road investments.

- 3. Publication of regular star rating results and annual crash risk mapping as part of routine asset management data collection initiatives.
- 4. Develop and implement national targets using star ratings for all road users that integrates with Movement and Place concepts.
- 5. Work towards a long-term vision of a road network where all travel occurs on 3-star or better roads by 2050, with higher targets for 4 and 5-star performance in high-demand areas (e.g. 5-star for pedestrians and cyclists in city centres and high-use areas and 5-star for motorised vehicles on high-volume national highways).
- 6. Link with iRAP global activities to integrate infrastructure star ratings and risk maps into satellite navigation systems (e.g. use of star-rated maps) for safest route and mode choice and associated trip planning.
- 7. Advocate for the application of the fit-for-purpose RAP methods (e.g. AiRAP, Network Screening Tools and LG Stars) at a strategic network level, especially for local roads.

## **ACRS** actions

1. Advocate for the recommended policy actions.

ROAD SA

- 2. Collaborate with governments and stakeholders on star ratings initiatives and raise awareness of their benefits and limitations in improving road safety.
- 3. Promote transparency and accountability in the development and implementation of road infrastructure star ratings.
- 4. Engage with road users (e.g. drivers, logistics companies, health and safety advisors and others relying on the road as a workplace) for safe route planning using star rating information.
- 5. Recognise and celebrate high performing roads that have improved the star rating to 3-star or better performance.
- 6. Initiate and support workshops at all Chapters to build capacity in understanding star ratings, risk maps, safer road investment plans and their role in informing policy and investment decisions.
- 7. Seek funding and sponsorships to establish a national outreach program or awareness campaign to widely disseminate information about star ratings to various road user groups, professional associations, community groups and the media.
- 8. Participate in international outreach programs organised by iRAP and its partners.
- 9. Collaborate with national research institutions and bodies such as the Australian Research Council, National Health and Medical Research Council, Universities, national third party insurers, workplace health and safety authorities to secure funding for research and audits to refine and improve the program as part of the global iRAP Innovation Framework.

# References

- 1. International Road Assessment Programme. iRAP Safety Insights Explorer. <u>https://irap.org/safety-insights-explorer/</u>: iRAP; 2021.
- Austroads. NEG6384 Movement and Place Guidance Research Report. <u>https://austroads.gov.au/projects/project?id=NEG6384</u>: Austroads: 2024.
- 3. International Road Assessment Programme. Safer Roads Investment Plans. <u>https://irap.org/rap-tools/investment-planning/safer-roads-investment-plans/</u>: iRAP; 2021.
- International Road Assessment Programme. iRAP receives Google support to advance the United Nations Sustainable Development Goals and Road Safety. <u>https://irap.org/2023/09/irap-receives-google-support-to-advance-the-un-sdgs-and-road-safety/</u>: iRAP; 2023.

- Supporting our members to eliminate serious road trauma through knowledge sharing, professional development, networking and advocacy
- 5. International Road Assessment Programme. Governance. <u>https://irap.org/about-us/structure-and-governance/</u>: iRAP; 2021.
- 6. International Road Assessment Programme. Innovation. <u>https://irap.org/innovation/</u>: iRAP; 2021.
- 7. International Road Assessment Programme. Star Ratings. <u>https://irap.org/rap-tools/infrastructure-ratings/star-ratings/</u>: iRAP; 2021.
- 8. International Road Assessment Programme. Fact Sheet 3: Road Attributes. <u>https://irap.org/methodology/</u>; iRAP; 2015.

ROAD SA

- 9. International Road Assessment Programme. Fact Sheet 6: Star Rating Score Equations. https://irap.org/methodology/; iRAP; 2014.
- 10. International Road Assessment Programme. RAP Infrastructure Safety Management Tools. <u>https://irap.org/rap-tools/</u>: iRAP; 2021.
- 11. Department of Economic and Social Affairs. Sustainable Development Goals. <u>https://sdgs.un.org/goals</u>: United Nations; 2024.
- 12. World Health Organization. Global Plan for the Decade of Action for Road Safety 2021-2030. <u>global-plan-for-road-safety.pdf</u>: WHO; 2021.
- 13. International Road Assessment Programme. Pledge for Safety Roads and Mobility. <u>https://pledge.irap.org/</u>: iRAP; 2024.
- 14. International Road Assessment Programme. Policies into Practice. <u>Policies into practice iRAP</u>: iRAP; 2021.
- 15. International Road Assessment Programme. NACTO-GDCI and iRAP release animations to demonstrate how low-speeds can protect people. <u>https://irap.org/2021/05/nacto-gdci-and-irap-release-animations-to-demonstrate-how-low-speeds-can-protect-people/</u>: iRAP; 2021.
- 16. International Road Assessment Programme. AiRAP. <u>https://irap.org/project/ai-rap/</u>: iRAP; 2021.
- 17. International Road Assessment Programme. AiRAP Automation for Australian Road Safety. <u>https://imoveaustralia.com/wp-content/uploads/2023/05/AiRAP-Automation-for-Australian-Road-Safety-Final-report.pdf</u>: iRAP; 2022.
- Western Australia Local Government Association. LG Stars, Road Safety Ratings for Local Government Roads, Assessment Guide. <u>https://www.roadwise.asn.au/Profiles/roadwise/Assets/ClientData/Documents/2022\_WALGA\_Road</u> <u>Wise\_LG\_Stars\_Road\_Safety\_Ratings\_Tool\_Assessment\_Guide.pdf</u>: WALGA; 2023.
- 19. Austroads. Network Design for Road Safety (Stereotypes for Cross-sections and Intersections): User Guide. <u>https://austroads.gov.au/publications/road-design/ap-r619-20</u>: Austroads; 2020.
- 20. Austroads. Infrastructure Risk Rating Manual for Australian Roads. <u>https://austroads.gov.au/publications/road-safety/ap-r587a-19</u>: Austroads; 2019.