World Bank GRSF and Asian Development Bank (ADB), in partnership with APRSO, iRAP and GRSP

Helping save lives from road crashes in Asia-Pacific

5-part webinar series - 8, 10, 15, 17, 24 February 2022

This webinar series was developed in partnership between:

ASIA-PACIFIC ROAD SAFETY OBSERVATORY

ADB

THE WORLD BANK
IBRD • IDA | WORLD BANK GROUP

GRSF
Global Road Safety Facility

Bloomberg Philanthropies
INITIATIVE FOR GLOBAL ROAD SAFETY

iRAP

GLOBAL ROAD SAFETY PARTNERSHIP

MODERATOR

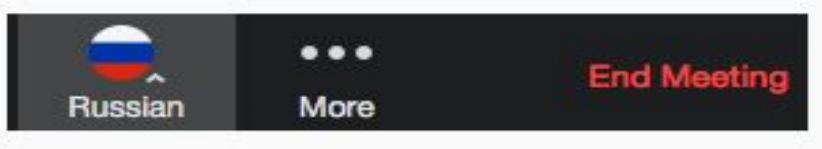
Blaise Murpret

Global Road Safety Partnership (GRSP)

Blaise.MURPHET@ifrc.org

PARTICIPANTS GUIDE ON ZOOM

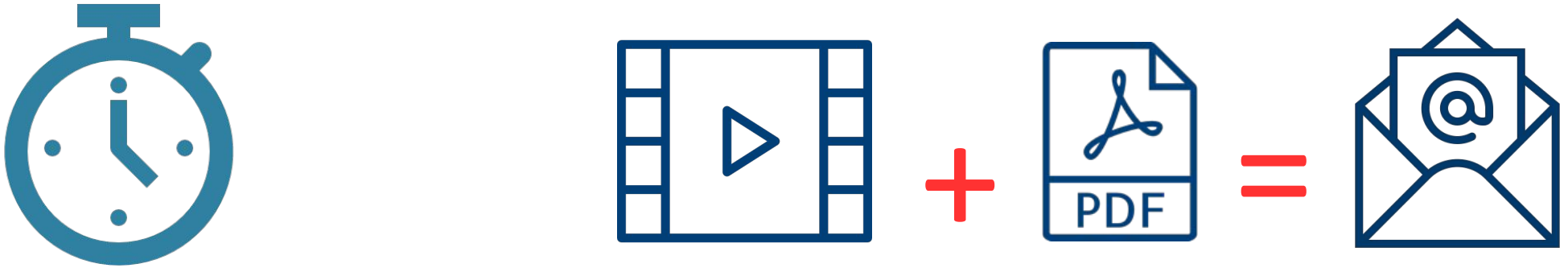
- Russian translation is available during the session. Please select your language preference (English or Russian) through the interpretation button.



- Sessions will have Q&A portion during the presentations and towards the end of each session. A Q&A icon is available for all participants. All questions will be managed by the moderator. Participants are strongly encouraged to submit questions and comments throughout each session in the Q&A icon function, and these will be raised, when possible, with facilitators.
- Zoom Webinar Icon meeting enabled for participants

HOUSEKEEPING

#HelpingSaveLives

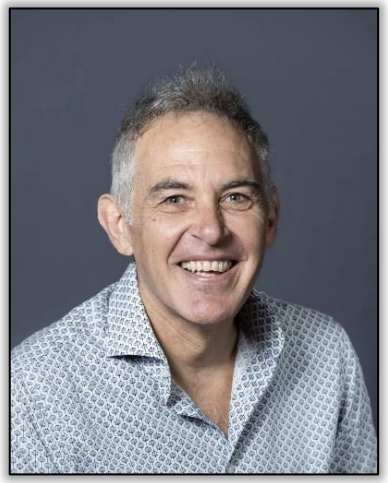


COURSE EXPECTATIONS

- Certificate of Attendance will be issued to the participants who have completed all sessions.

- Homework assignment is optional, but highly recommended

PRESENTERS



David Shelton
Senior Transport Specialist
(Road Safety)
Asian Development Bank

Alina F. Burlacu
Senior Transport Specialist
Global Road Safety Facility
The World Bank

Rob McInerney
Chief Executive Officer
iRAP

Emily McLean
Portfolio Leader – Infrastructure Safety Management
Australian Road Research Board

Greg Smith
Global Programme Director
iRAP

Overview of the webinar session

Topic	Speaker
Opening and welcome	Blaise Murphet, GRSP
Overview of Asian Development Bank (ADB) road safety initiatives	David Shelton, ADB
Overview of World Bank's Global Road Safety Facility (GRSF) engagement and the Bloomberg Philanthropies Initiative for Global Road Safety (BIGRS)	Alina Burlacu, World Bank GRSF
The Global Plan, functional road classifications and safety performance standards	Rob McInerney, iRAP
Safe-system infrastructure	Emily McLean, ARRB/AusRAP
Best practice examples in design standards and guides	Greg Smith, iRAP and Blair Turner, GRSF
Questions from the audience	Blaise Murphet, GRSP
Summary and close	Blaise Murphet, GRSP

Overview of Asian Development Bank (ADB) road safety initiatives

David Shelton
Asian Development Bank

Why we are committed to change

Across Asia and the Pacific:

- Approximately 747,500 people die in road crashes every year representing 55% of the global total
- 7.5 to 11.2 million people are severely injured each year
- Road casualties create grief and suffering for tens of millions of families and relatives
- World's highest proportion of vulnerable road user fatalities
- Road crashes are the leading cause of death for children and young adults
- Road deaths and injuries cost developing countries 3-5% of GDP
- Safest countries see 3 to 5 deaths per 100,000 population while in the poorest performing countries it is over 20.

ADB commitment to road safety

UN General Assembly Resolution 74/299 declared a **Decade of Action for Road Safety 2021–2030**, with the target to reduce road traffic deaths & injuries

BY AT LEAST 50% during that period

ADB Joins Partners in Supporting Decade of Action on Road Safety

News Release | 16 November 2020

ADB road safety alignment

Target 1: By 2020, all countries establish a comprehensive multisectoral national road safety action plan with time-bound targets.

Target 2: By 2030, all countries accede to one or more of the core road safety-related UN legal instruments.

Target 3: By 2030, all new roads achieve technical standards for all road users that take into account road safety, or meet a three star rating or better.

Target 4: By 2030, more than 75% of travel on existing roads is on roads that meet technical standards for all road users that take into account road safety.

Target 5: By 2030, 100% of new (defined as produced, sold or imported) and used vehicles meet high quality safety standards, such as the recommended priority UN Regulations, Global Technical Regulations, or equivalent recognized national performance requirements.

Target 6: By 2030, halve the proportion of vehicles travelling over the posted speed limit and achieve a reduction in speed-related injuries and fatalities.

Target 7: By 2030, increase the proportion of motorcycle riders correctly using standard helmets to close to 100%.

Target 8: By 2030, increase the proportion of motor vehicle occupants using safety belts or standard child restraint systems to close to 100%.

Target 9: By 2030, halve the number of road traffic injuries and fatalities related to drivers using alcohol, and/or achieve a reduction in those related to other psychoactive substances.

Target 10: By 2030, all countries have national laws to restrict or prohibit the use of mobile phones while driving.

Target 11: By 2030, all countries to enact regulation for driving time and rest periods for professional drivers, and/or accede to international/regional regulation in this area.

Target 12: By 2030, all countries establish and achieve national targets in order to minimize the time interval between road traffic crash and the provision of first professional emergency care.

ADB road safety alignment

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1) Financed sub-regional and national road safety strategies
Continuing efforts to ensure all countries have up to date action plans

2) More work to grow country accension to UN safety-related legal instruments
Challenge to ensure effective implementation

UN Regulations, Global Technical Regulations, or equivalent recognized national performance requirements.

Target 9: By 2030, halve the number of road traffic injuries and fatalities related to drivers using alcohol, and/or achieve a reduction in those related to other psychoactive substances.

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ADB road safety alignment

3) Transport continues to be the largest ADB investment area. Increasing adoption of safety rating in road projects.

4) Majority of road investments are improving safety on the highest volume roads across A-P.

ADB road safety alignment

Target 5: By 2030, 100% of new (defined as produced, sold or imported) and used vehicles meet high quality safety standards, such as the recommended priority UN Regulations, Global Technical Regulations, or equivalent recognized national performance requirements.

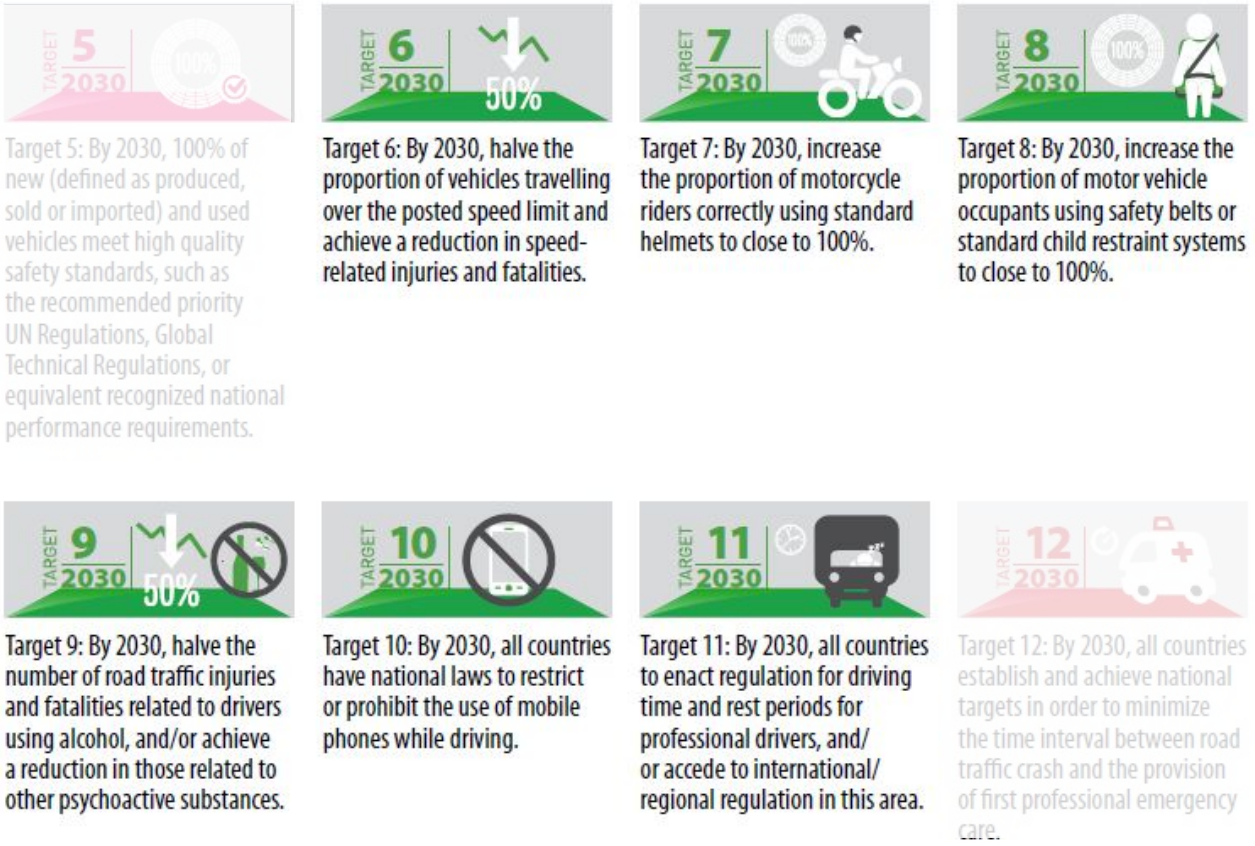
5) Strategy development addresses all aspects of the Safe System.

More work to do to lift new vehicle standards.

ADB road safety alignment

6-11) Significant financing going into training and equipping traffic police to improve enforcement. Continued and expanded effort needed

11) Significant challenges in addressing fatigue.

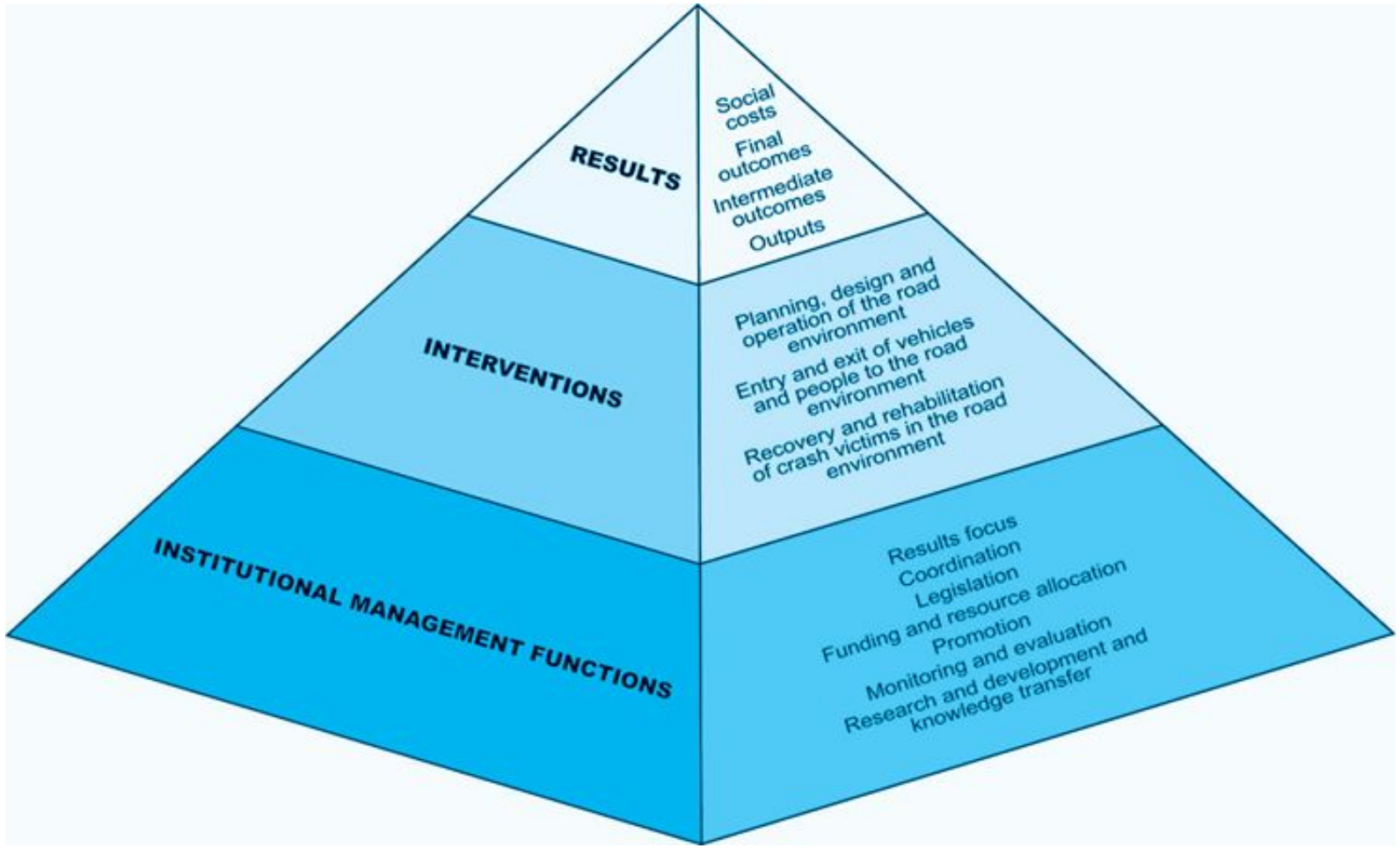


ADB road safety alignment

12) Some financing of improved crash response and trauma system performance.

Greater collaboration with health sector needed to build performance

Building road safety capacity



Bliss and Breen 2008

CAREC road safety program

Sub-regional project to embed road safety features into road projects
technical support for national road safety policy initiatives, and support institutional strengthening and capacity development

- Regional Road Safety Strategy
- Road safety engineering manuals
- Regional road safety committee
- Road safety training

India State Support Road Safety Program

Results Based Loan
US$1B co-financing

Objective is to reduce road crash related deaths across 14 States of India contributing to around 85% of road fatalities.

Reform, Recognize, Realign, Rewards: Builds on past national and state efforts

- Improved crash data management
- Technology for traffic enforcement
- Driver training and testing
- Programs to reduce driver fatigue
- Automated fines management

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सड़क परिवहन और राजमार्ग मंत्रालय
Ministry of Road Transport and Highways

ADB

Improving Road Safety across ASEAN

Completed project

- Regional road safety strategy for ASEAN
- Road safety management training
- All 10 ASEAN countries developed road safety action plans and implemented them to varying degrees
- Review of Road Safety Conditions in Myanmar
- Coordinated through ASEAN Multisector Road Safety Special Working Group (MRSSWG)

Opportunity for follow-up project

ASSOCIATION OF SOUTHEAST ASIAN NATIONS

ADB

Asia-Pacific Road Safety Observatory

ASIA-PACIFIC ROAD SAFETY OBSERVATORY

ADB

UNITED NATIONS ESCAP
Economic and Social Commission for Asia and the Pacific

FIA

International Transport Forum

THE WORLD BANK
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GRSF
Global Road Safety Facility

World Health Organization

UKaid
from the British people

ADB

Thank you.

Questions?

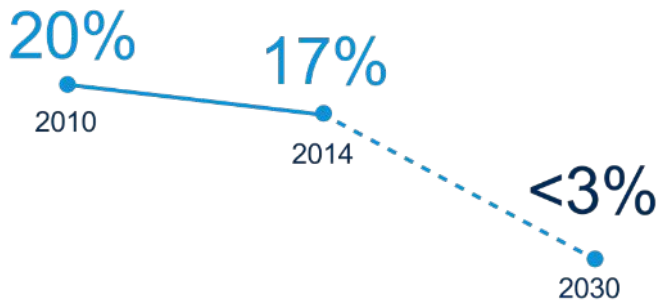
Overview of World Bank's GRSF engagement and the BIGRS

Alina F. Burlacu
Senior Transport Specialist
Global Road Safety Facility, The World Bank

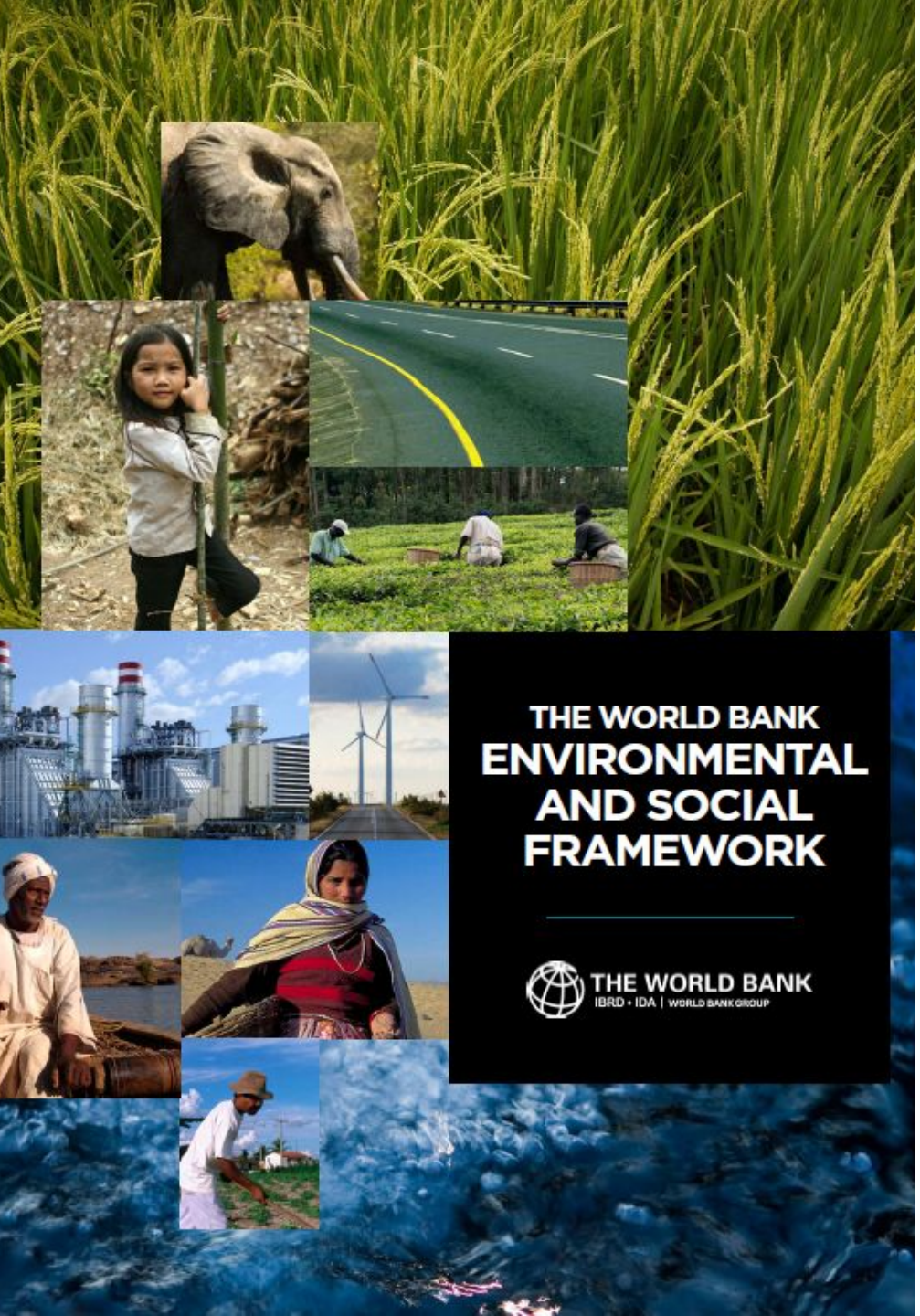
World Bank Twin Goals

Goal 1: Improve equality

Goal 2: Reduce extreme poverty



World Bank financed Transport projects: 162, $30 BILLION



Road Safety in the new World Bank policy

- Part of World Bank Environmental and Social Framework (ESF)
- ESS4 Para 10-13
  - Identify risks
  - Do road safety assessments
  - Implement feasible mitigation measures
  - Monitor safety
  - Procure safe vehicles
  - Operate construction equipment safely on public roads

https://thedocs.worldbank.org/en/doc/648681570135612401-0290022019/original/GoodPracticeNoteRoadSafety.pdf

GRSF OVERVIEW

THE GLOBAL ROAD SAFETY FACILITY (GRSF) is a global multi-donor fund hosted by the World Bank since 2006. Its mission is to help governments develop road safety management capacity and scale up road safety delivery in low- and middle-income countries.

- work has expanded to 83+ countries.
- since 2016, received total donor pledges of $73.1 million.
- recent investments (since 2018) resulted in thousands of lives saved

GRSF provides funding, knowledge, and technical assistance designed to scale-up the efforts of LMICs to build their scientific, technological, managerial and delivery capacities for sustainable road safety.

BIGRS OVERVIEW

Bloomberg Philanthropies

GRSF Global Road Safety Facility

WORLD RESOURCES INSTITUTE

Johns Hopkins International Injury Research Unit

NACTO

Global Designing Cities Initiative

GLOBAL NCAP

GLOBAL ROAD SAFETY PARTNERSHIP

IACP

Vital Strategies

Global Health Advocacy Incubator

World Health Organization

ASIA-PACIFIC ROAD SAFETY OBSERVATORY

ADB

THE WORLD BANK

GRSF Global Road Safety Facility

Bloomberg Philanthropies INITIATIVE FOR GLOBAL ROAD SAFETY

iRAP

GLOBAL ROAD SAFETY PARTNERSHIP

GRSF IN BIGRS 2020-2025

- **Safety assessments and capacity building for safer road infrastructure**
- **Speed management research and in-country support**
- **Enhancement of road safety data management**

GRSF IN BIGRS 2020-2025: SPEED MANAGEMENT

- **Speed Management Hub launched on Feb 2021**
  - › Extensive FAQ on speed management
  - › Digital resource library, videos and GRSF research
  - › Work ongoing to prepare a Global Speed Management Guide and update the Speed Management Manual
  - › Research ongoing on the economics and benefits of speed management
  - › Technical analysis on speed management in 3 countries close to completion

roadsafetyfacility.org/programs/speed-management-hub

GRSF IN BIGRS 2020-2025 : IN COUNTRY ACTIVITIES

Safe Infrastructure

- **Safety Assessments**
  - 1,375km of roads assessed, and 91km of roads with recommendations already incorporated in final designs.
  - Assessments are being conducted in Brazil, Ecuador, Philippines, Ethiopia, People's Republic of China and Viet Nam; with more ongoing in Ghana, Colombia and Uganda.

- **Capacity Building**
  - Since we started the program, over 9,900 people trained.
  - The iRAP Toolkit is being updated

GRSF SUPPORT IN INDIA : BIGRS 2020-2025

- Safety Assessments
  - 450km of high-risk, high-volume national highways will be assessed in Maharashtra
  - Redesign of 22 blackspot locations in Mumbai (incorporating iRAP recommendations) completed and submitted to MCGM and MMRDA
- Crash Data Management
  - DRIVER 2.0 deployed in Mumbai and historical data (2015-19) has been migrated
- Capacity Building
  - 916 people trained in India since program inception

GRSF SUPPORT IN BANGLADESH: BIGRS 2020-2025

GRSF supporting World Bank financed Bangladesh Road Safety Project

- National Crash Data Study
  - Objective is to review current crash data management systems in Bangladesh and provide recommendations in improving the collection, management, and analysis of data in the country
  - Study will inform the design, development, and implementation of a national crash database system
- GRSF Research Grant of $500,000
- Think Road Safety Course in Bangla

GRSF SUPPORTS IN VIETNAM : BIGRS 2020-2025

- Safety Assessments
  - 258km of roads assessed (NH19 under Central Highlands Connectivity Improvement Project CHCIP)
  - 50km safety assessments planned under the Viet Nam Road Asset Management Project VRAMP
  - 30km safety assessments planned under the Ho Chi Minh City Green Transport Development
- Capacity Building
  - 113 professionals participated in a series of presentations, training and workshops
- Technical support
  - Safety upgrade for manual and standard for two-wheeler road infrastructure

GRSF SUPPORTS IN PHILLIPINE: BIGRS 2020-2025

- Safety Assessments
  - 20km RSA for bicycle lanes
  - 14.30km for Cebu BRT project
  - 25km safety assessments planned + capacity under Metro Manila BRT Line 1 Project.
  - 53.7km safety assessments planned + capacity under Cebu Bus Rapid Transit (BRT) Project.
  - Technical assistance for 4,000km safety assessments of national roads under the road safety RAS
- Capacity Building
  - 3,470 professionals received road safety training

Questions?

GLOBAL PLAN

DECADE OF ACTION FOR ROAD SAFETY
2021–2030

Safe Road Infrastructure

Rob McInerney
Chief Executive Officer, iRAP

Our Target: Halve road deaths and injuries by 2030

UN General Assembly Resolution 74/299 declared a **Decade of Action for Road Safety 2021-2030**, with the target to reduce road traffic deaths & injuries

BY AT LEAST 50% during that period

DECADE OF ACTION FOR ROAD SAFETY
2021 - 2030

iRAP Partnerships for 2030 Impact

EuroRAP AusRAP usRAP KiwiRAP
ChinaRAP IndiaRAP BrazilRAP SARAP
ThaiRAP MyRAP

ASIA-PACIFIC ROAD SAFETY OBSERVATORY ADB THE WORLD BANK GRSF Global Road Safety Facility Bloomberg Philanthropies INITIATIVE FOR GLOBAL ROAD SAFETY iRAP GLOBAL ROAD SAFETY PARTNERSHIP

Safe Road Infrastructure

Target 3: By 2030, all new roads achieve technical standards for all road users that take into account road safety, or meet a three star rating or better.

Target 4: By 2030, more than 75% of travel on existing roads is on roads that meet technical standards for all road users that take into account road safety.

Achieving >75% of travel globally on 3-star or better roads will save…

450,000+ lives a year

with a return on investment of…

$8 for every $1 invested

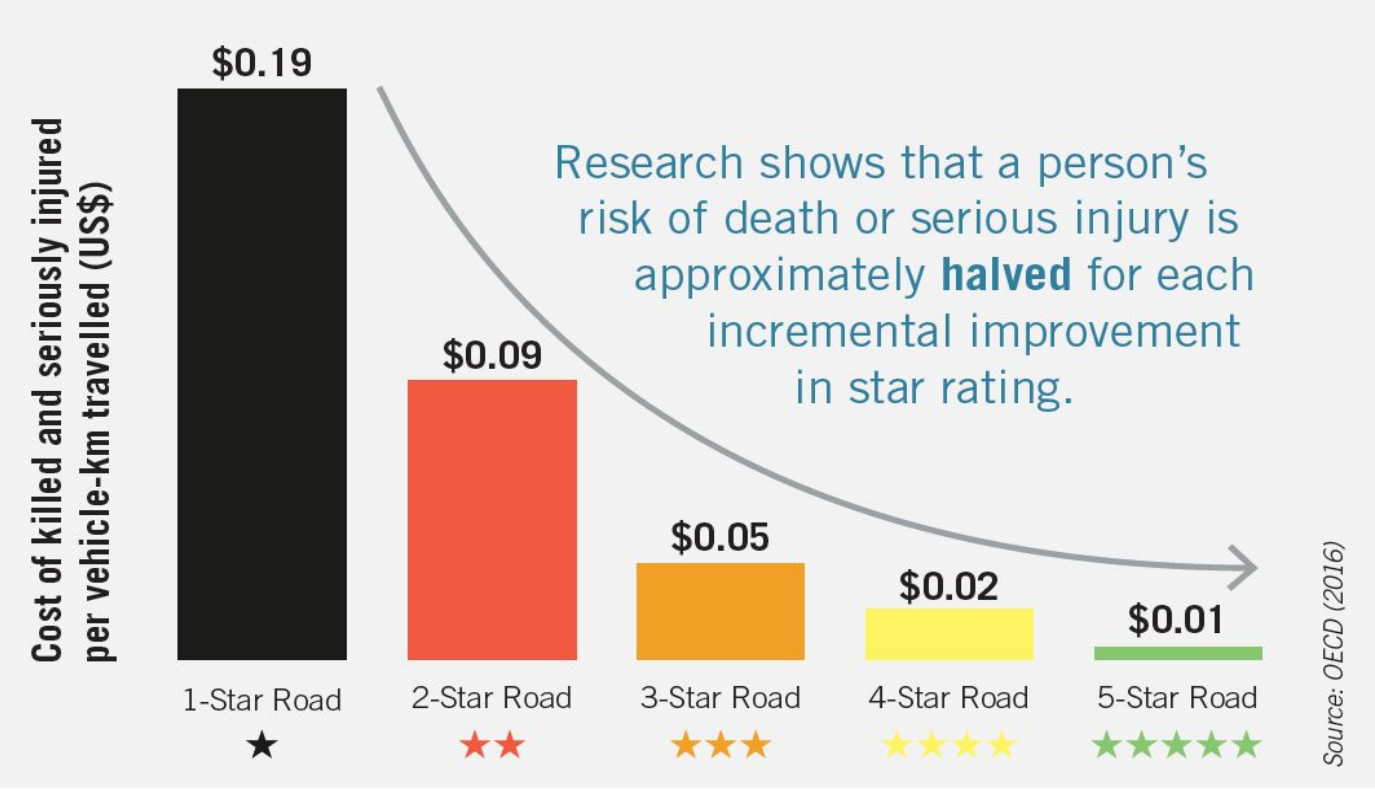
Box 2

Recommended actions to improve the safety of road infrastructure

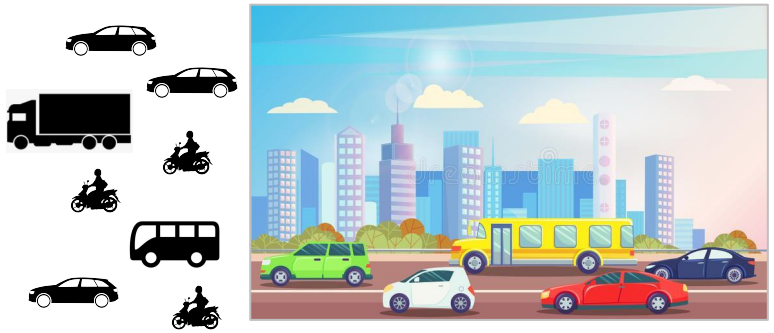
- Develop functional classifications and desired safety performance standards for each road user group at the geographic land-use and road corridor level.
- Review and update legislation and local design standards that consider road function and the needs of all road users, and for specific zones.
- Specify a technical standard and star rating target for all designs linked to each road user, and the desired safety performance standard at that location.
- Implement infrastructure treatments that ensure logical and intuitive compliance with the desired speed environment (e.g. 30 km/h urban centres; ≤ 80 km/h undivided rural roads; 100 km/h expressways).
- Undertake road safety audits on all sections of new roads (pre-feasibility through to detailed design) and complete assessments using independent and accredited experts to ensure a minimum standard of three stars or better for all road users.
- Undertake crash-risk mapping (where crash data are reliable) and proactive safety assessments and inspections on the target network with a focus on relevant road user needs as appropriate.
- Set a performance target for each road user based on the inspection results with clear measurable metrics at the road-attribute level (e.g. sidewalk provision).

Star Ratings and the iRAP free tools

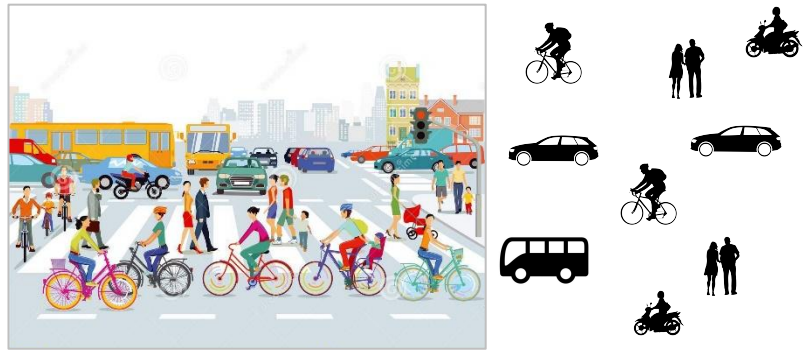
https://irap.org/rap-tools/



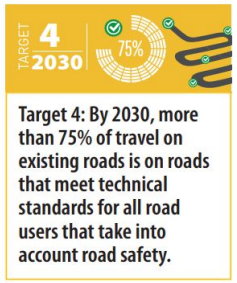
Functional Classifications & Star Rating Standards



Increasingly motorised



ACTION: Generate 75% of Travel Maps for your country



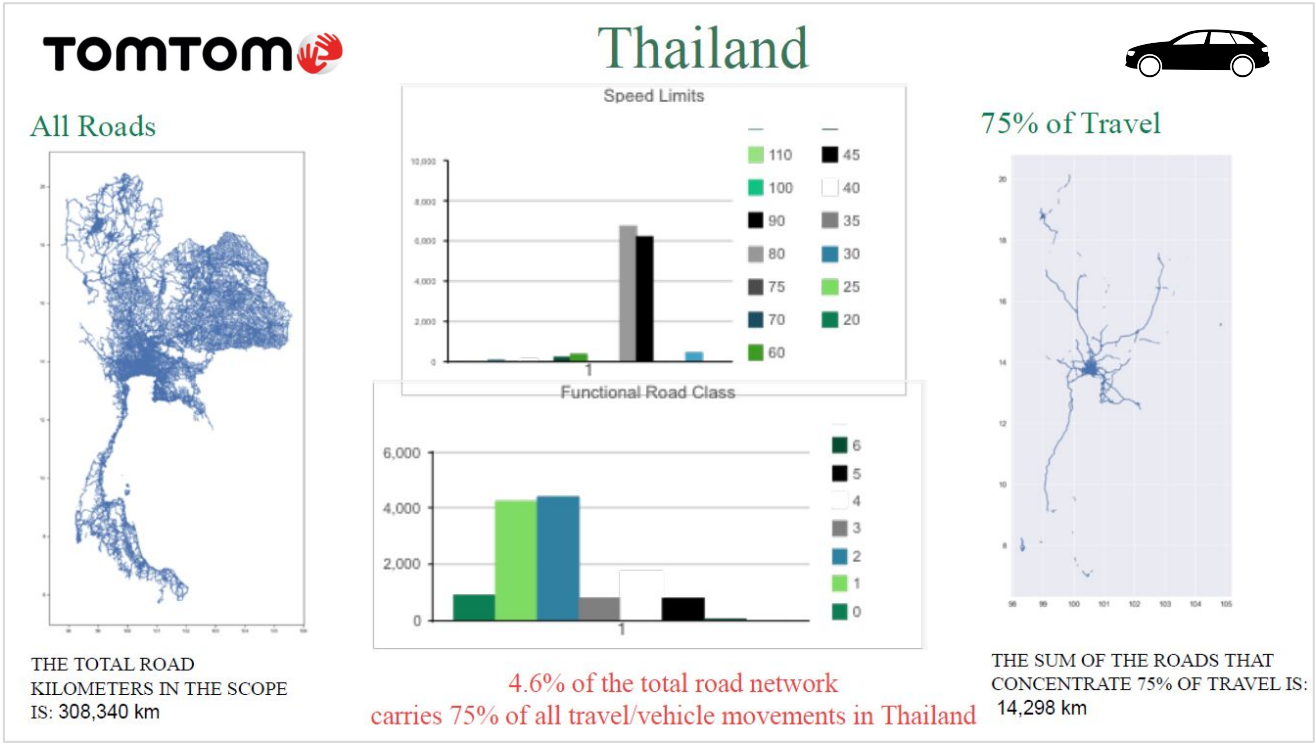
Map 1: Highlight mass transit and freight options

Map 2: Highlight the busiest roads for pedestrians

Map 3: Highlight the busiest roads for cyclists

Map 4: Highlight the busiest roads for motorcyclists

Map 5: Highlight the busiest roads for vehicles



ACTION: Set Ambitious & Achievable Targets for 2030

Define % of travel AND % of the network to be 3-star or better

+

High crash-risk locations

Flow	Busiest Roads					Target by 2030
High	Top 10% of travel					5-star
Medium	Next 25% of travel					4-star
Low	Next 40% of travel					3-star
>0	Remaining roads					2-star
None	0					N/A

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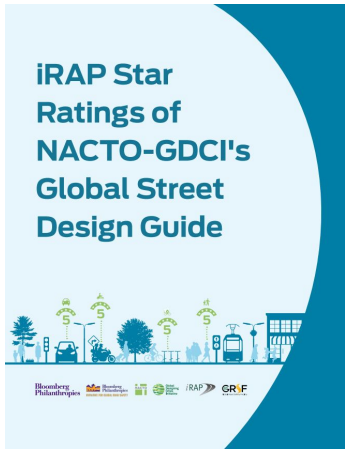
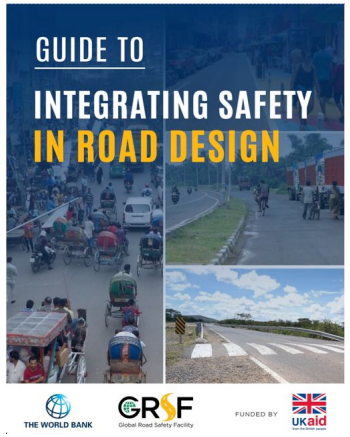
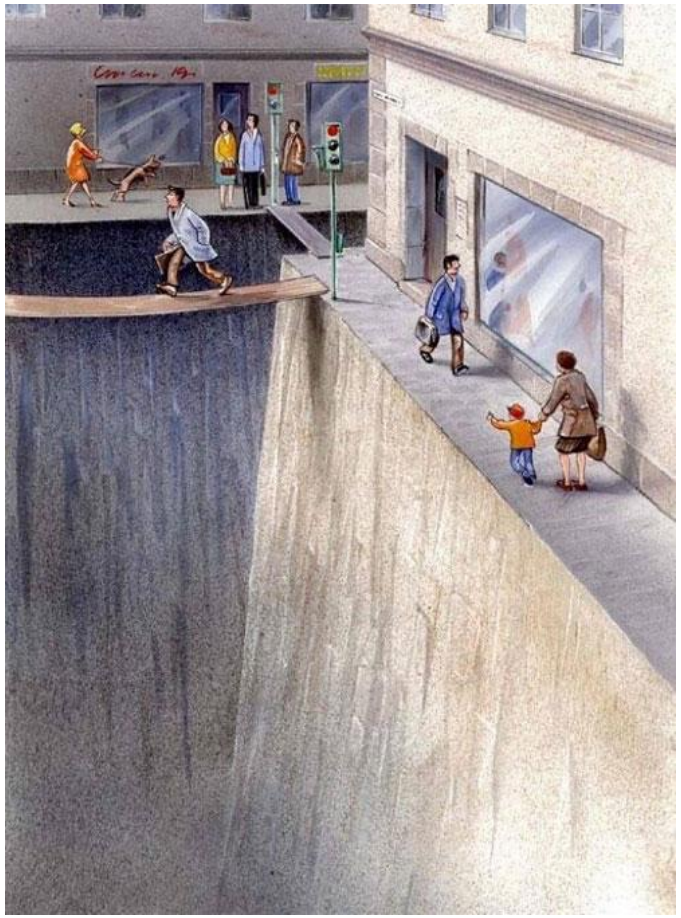
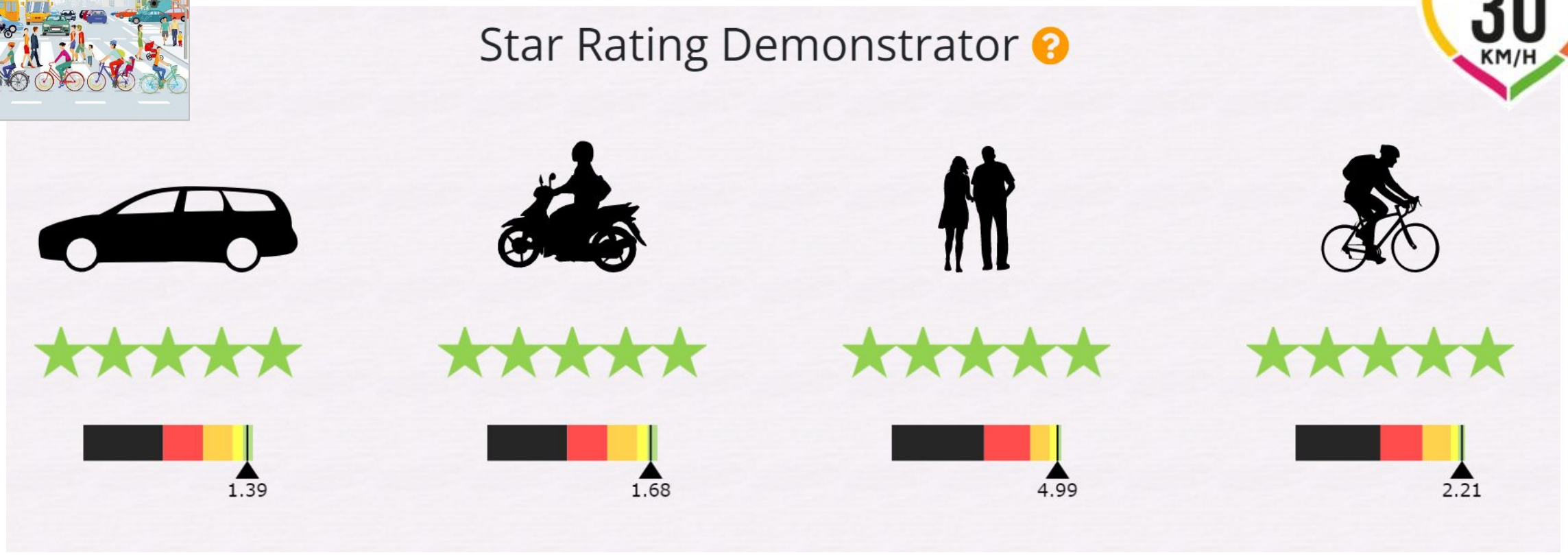
Update design standards based on road function







ACTION: Check the Roads you are about to build!!



Specify a Star Rating for all designs - for each road user

Add this to your next road design specification…….

The new road shall be designed to maximise lives saved, reduce injuries and the star rating performance for each road user subject to the following minimum acceptable standards……

Flow	Busiest Roads	Target by 2030
High	Top 10% of travel	5-star
Medium	Next 25% of travel	4-star
Low	Next 40% of travel	3-star

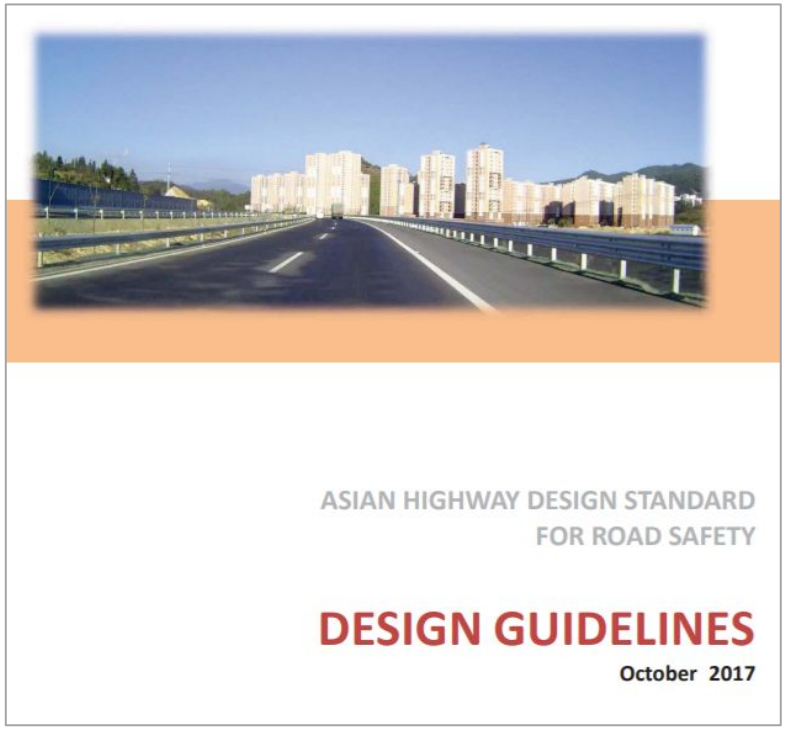
% of network

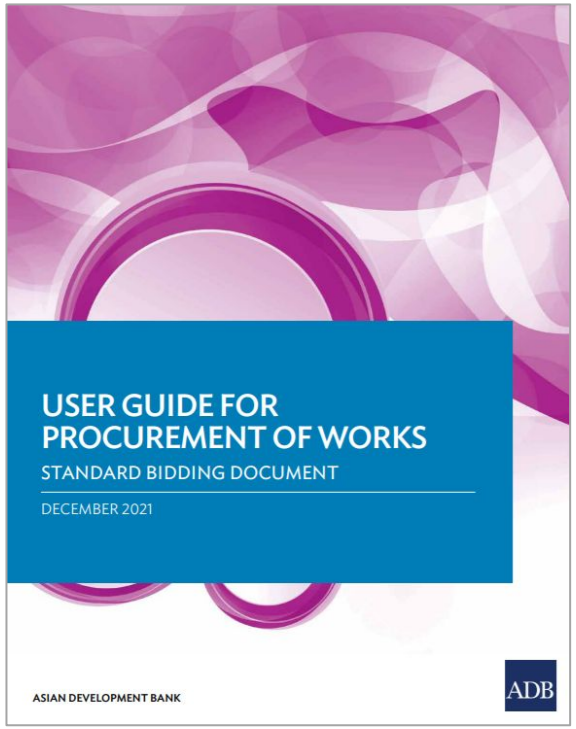
Functional Class

Highly Active

Low Motorisation

ACTION: Update your standard design specifications

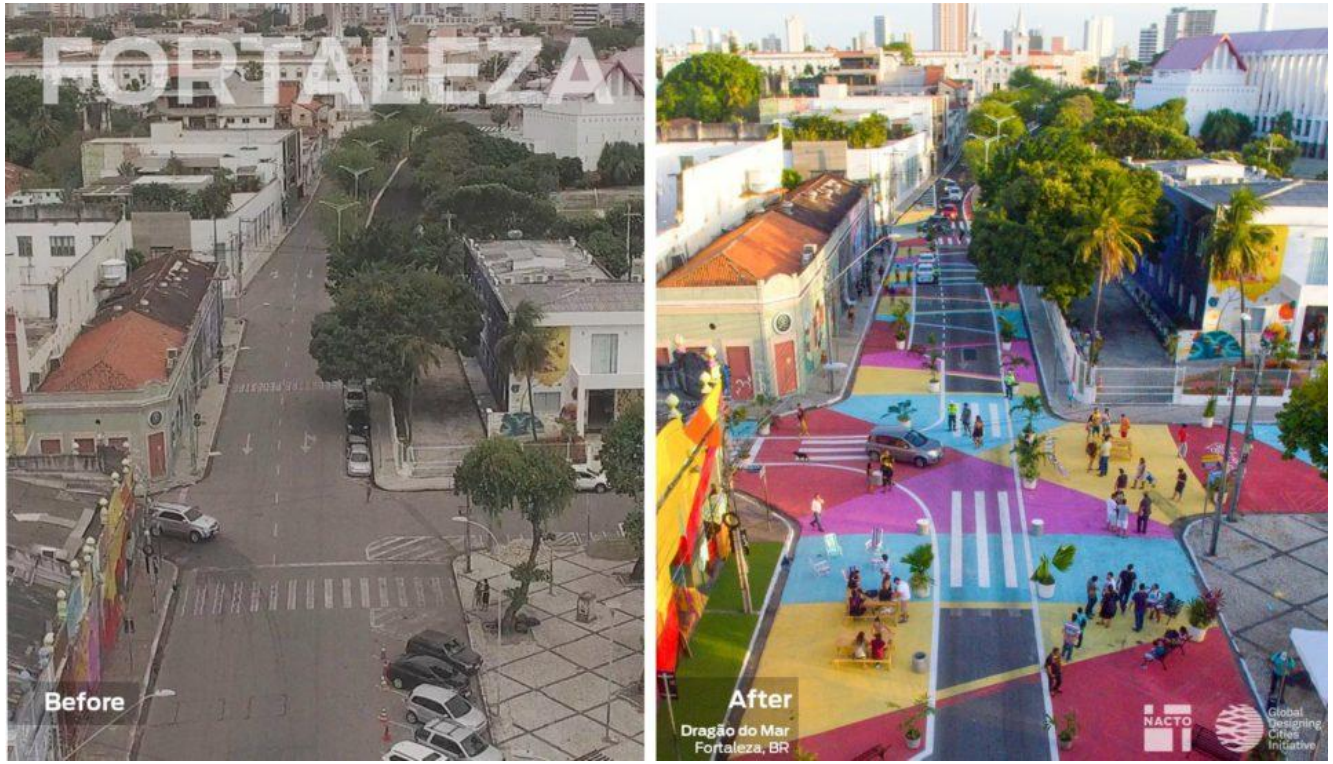




5. DESIGN STANDARDS AND SPECIFICATIONS

Design standards for this project will conform with "Manual of Standard & Specifications for two laning of State Highways (IRC: SP:73-2007)", "Specification for Road and Bridge Work" by Government of India, MORTH and various relevant IRC Standards and BIS Standards. Also "Geometric Design Standards for Highways" published by Ministry of Construction, Public Works, Myanmar, also reviewed for understanding. For comparison, design standards of Myanmar also summarised below, however Indian Standards has been adopted for the project.

Implement infrastructure to create desired safe speeds



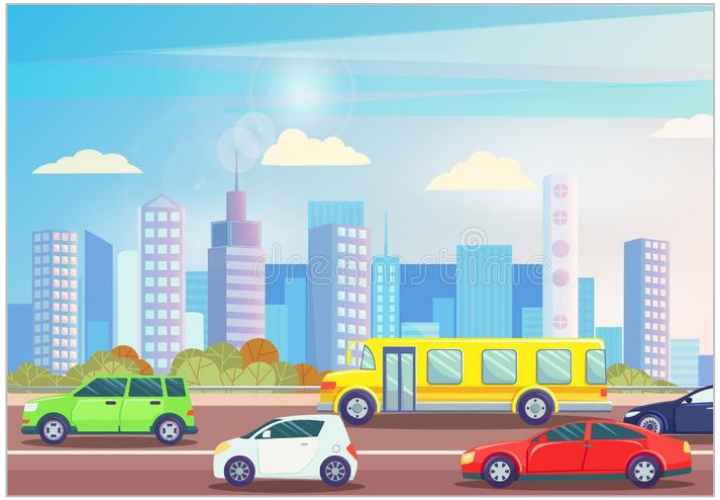
https://nacto.org/program/global-focus-cities/

ACTION: Target high-risk sites & transform speed

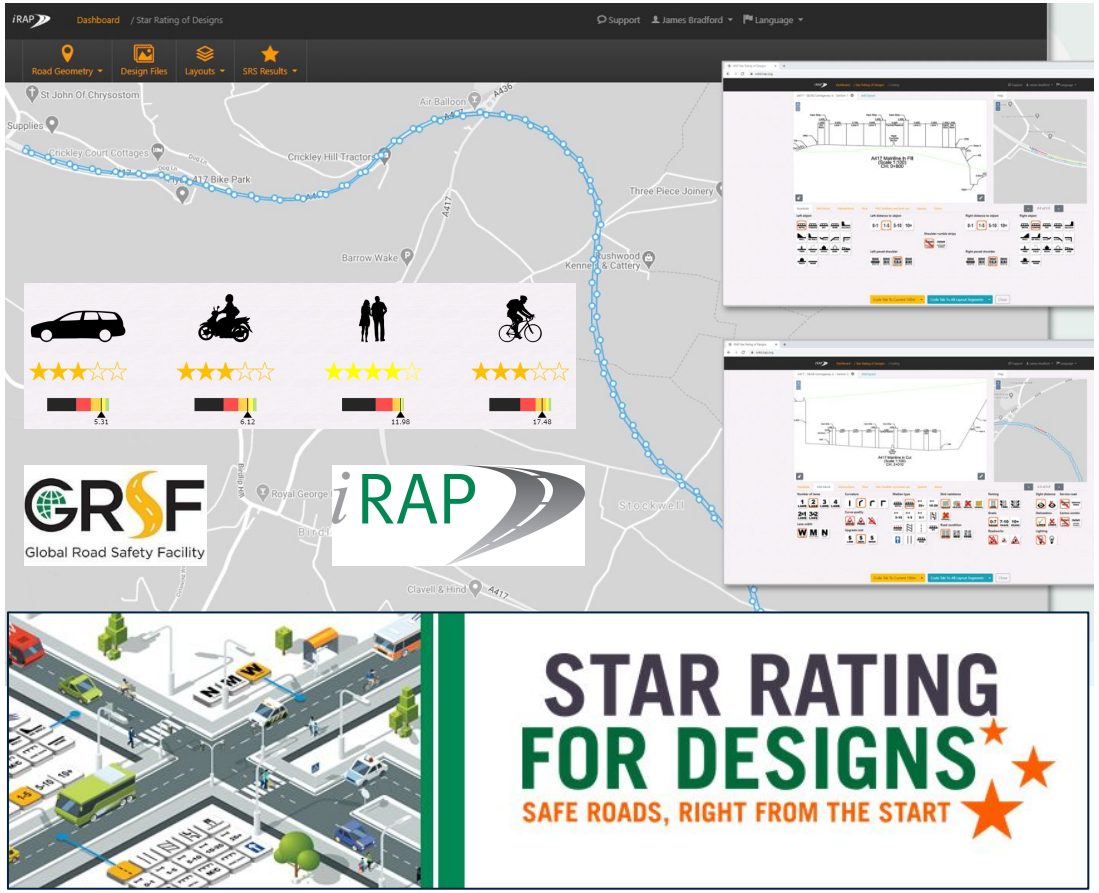
≤ 30

≤ 80

≤ 100

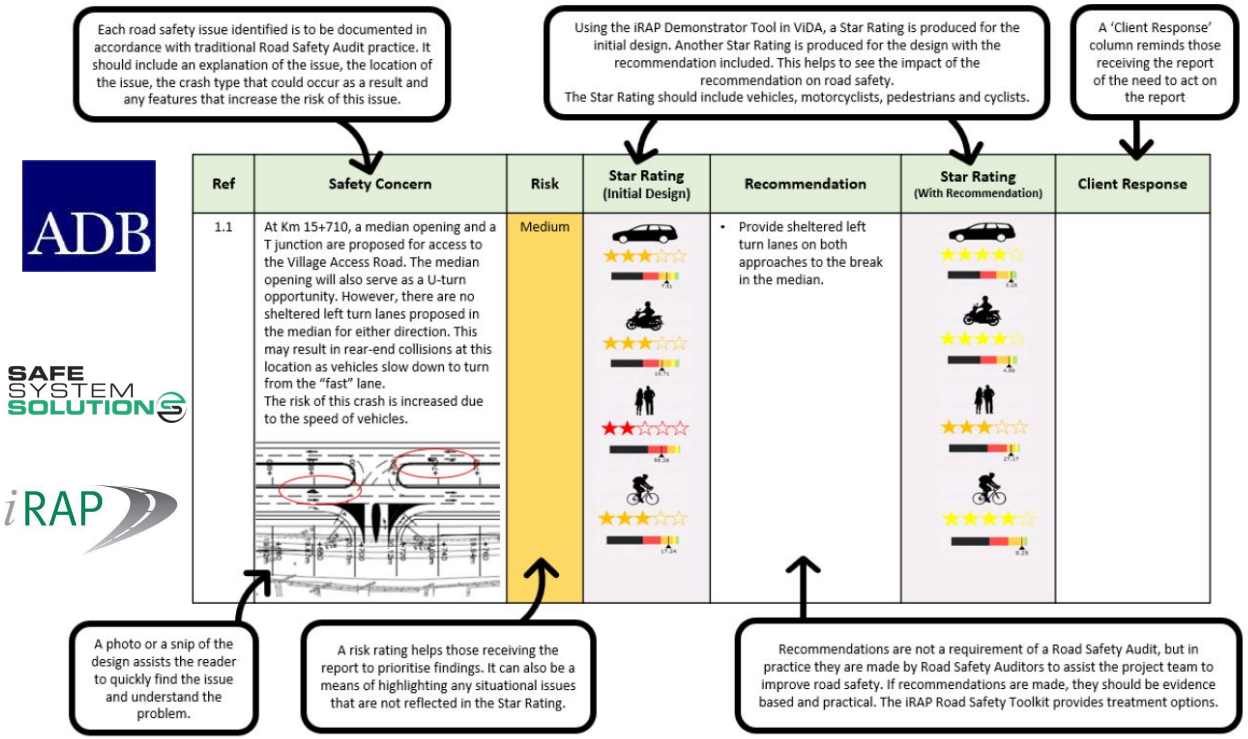


Undertake road safety audits & confirm 3-star or better

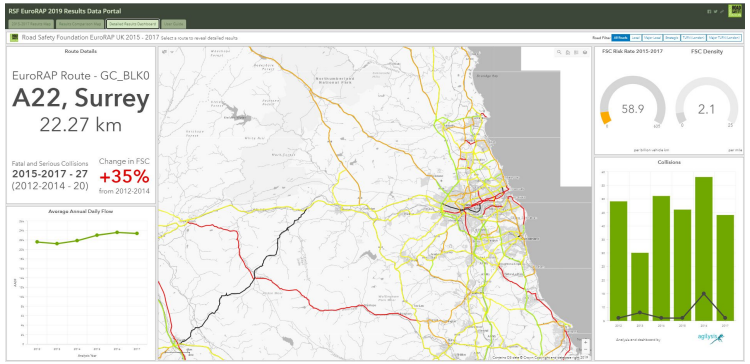


ACTION: Audit and Star Rate your active projects

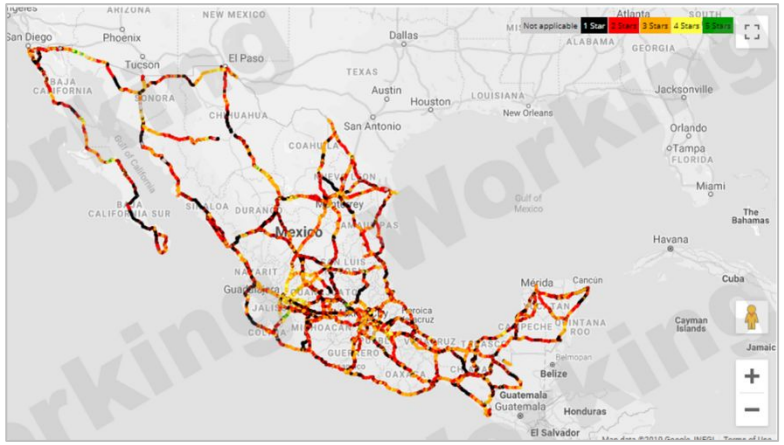
Figure 1 A typical RSA safety concerns and recommendations table with Star Ratings

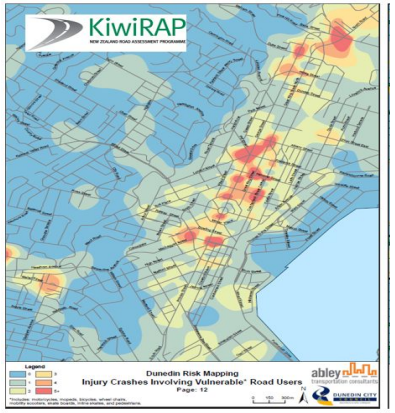


Crash risk mapping & star rating on existing roads

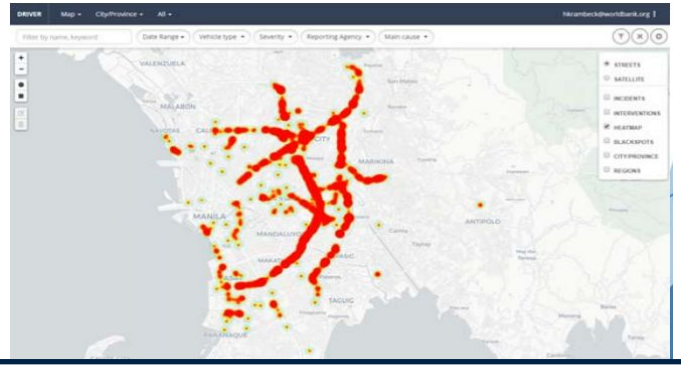


[EuroRAP Risk Mapping Results UK]

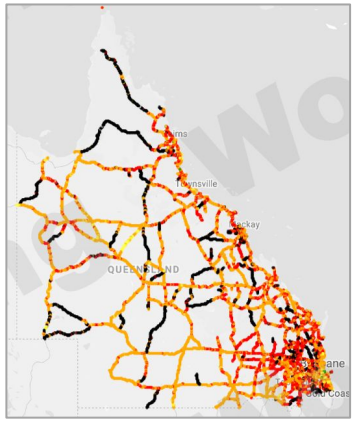




[KiwiRAP Risk Maps]



[https://www.roadsafetyfacility.org/programs/DRIVER]



ACTION: Crash Map & Star Rate 75% of Travel in 2022

TOMTOM

75% of Travel

Functional Road Class Distribution On Roads Where 75% of Travel Occurs

TARGET 4 2030 75%

Target 4: By 2030, more than 75% of travel on existing roads is on roads that meet technical standards for all road users that take into account road safety.

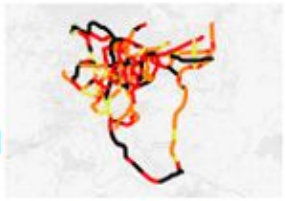
10.4% of network carries 75% of travel

THE SUM OF THE ROADS THAT CONCENTRATE 75% OF TRAVEL IS: 13,888 KM

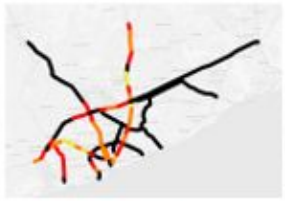
How does my city compare to others?

Pedestrian Star Ratings
(before changes were made)

- 1 star
- 2 stars
- 3 stars
- 4 stars
- 5 stars
- N/A

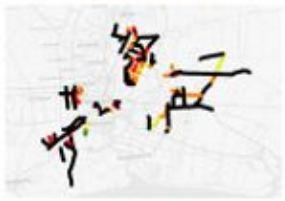


Addis Ababa



Accra

Bandung

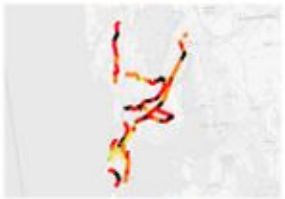


Bangkok

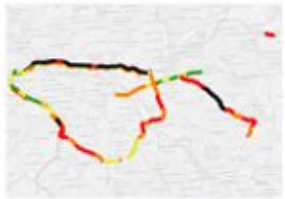
Bogota

Fortaleza

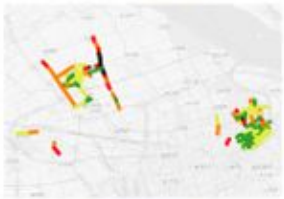
Ho Chi Minh City



Mumbai



Sao Paulo



Shanghai

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11 3

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Set performance targets at attribute level

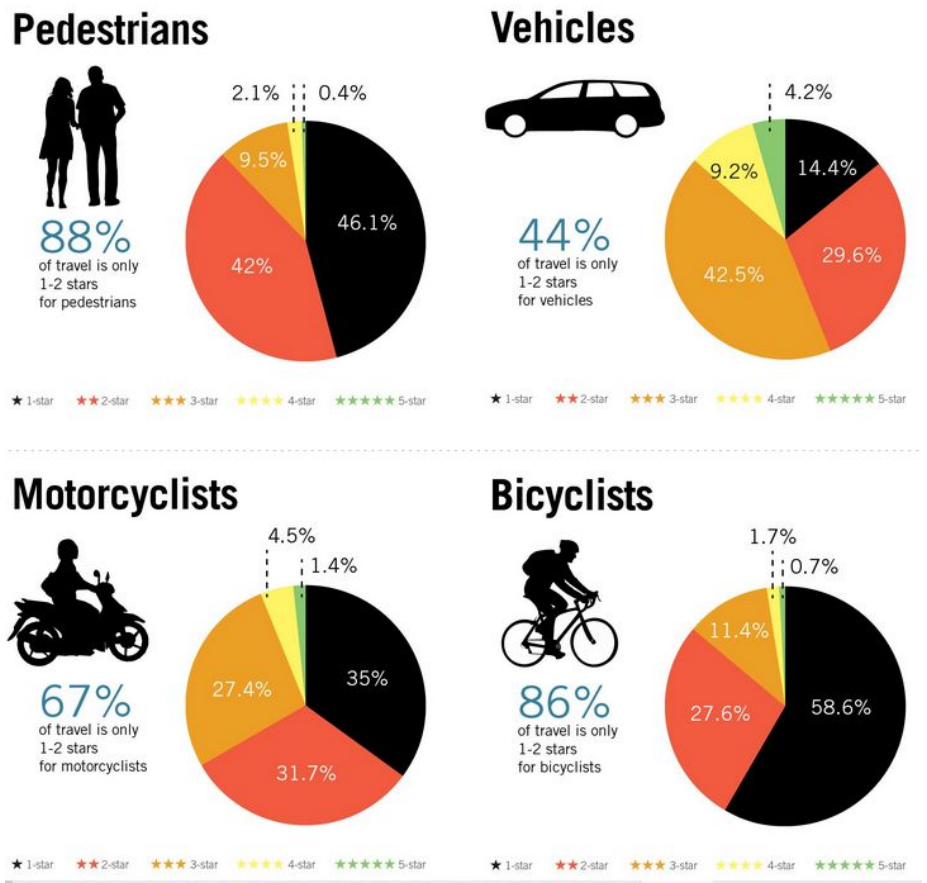
% of vehicle travel on roads with dangerous roadsides

% of vehicle travel on high-speed undivided roads

% of intersections with no pedestrian crossings or refuge

"If you can't measure it you can't manage it"

ACTION: Generate attribute baseline & targets in 2022



- 85% where people walk have no sidewalks and 40km/h +
- 81% of roads undivided and 80km/h +
- 79% risky roadsides and 80km/h+
- 73% risky intersections and 60km/h+

Based on a 358,000km sample of roads across 54 countries

https://www.vaccinesforroads.org/

ACTION: Invest in Safe Road Infrastructure & Celebrate

AIP FOUNDATION MAKING ROADS SAFE

https://irap.org/project/innovation-social-impact-investment/

How will you make sure it is a Decade of Action?

ACTION:

- Generate 75% of Travel Maps for your country
- Set Ambitious & Achievable Targets for 2030
- Check the Roads you are about to build!!
- Update your standard design specifications
- Target high-risk sites & transform speed
- Audit and Star Rate your active projects
- Crash Map & Star Rate 75% of Travel in 2022
- Generate attribute baseline & targets in 2022
- Invest in Safe Road Infrastructure & Celebrate

Questions?

Safe-system infrastructure

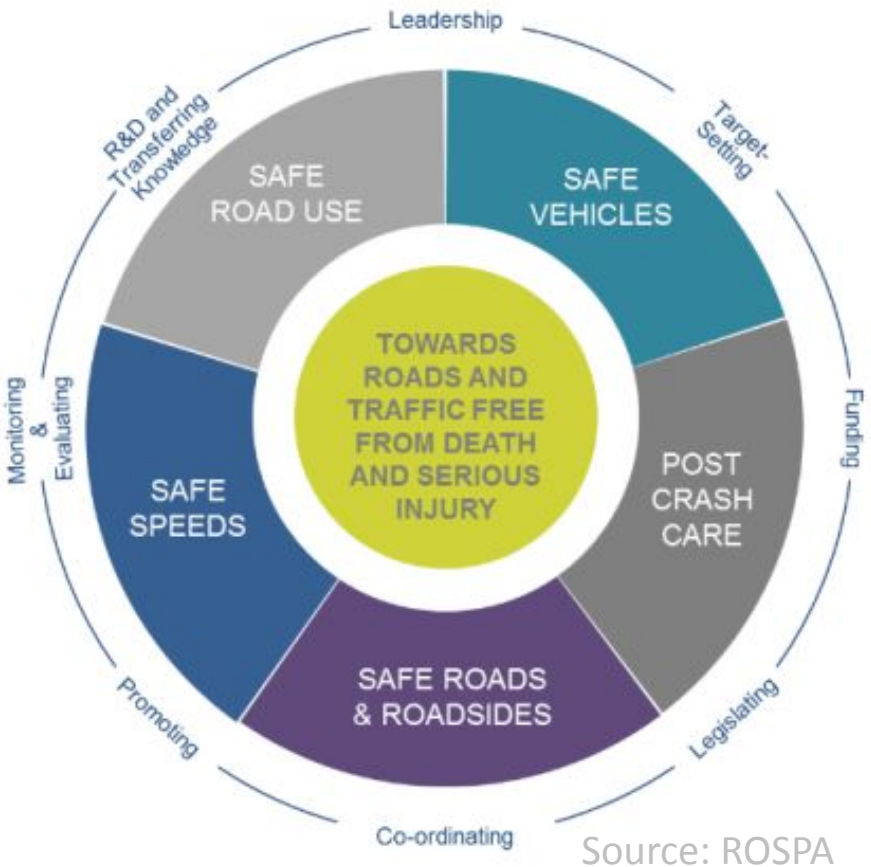
Emily McLean
Portfolio Leader – Infrastructure Safety Management
Australian Road Research Board

ARRB – Australian Road Research Board

- Australia's National Transport Research Organisation
- Established in 1960
- iRAP Centre of Excellence

Safe System Approach

- Moved on from ‘blame the road user’ culture
- To a safe system approach recognising:
  - People make mistakes
  - Human physical frailty
  - Road safety is a shared responsibility
  - Building a safe and forgiving road system



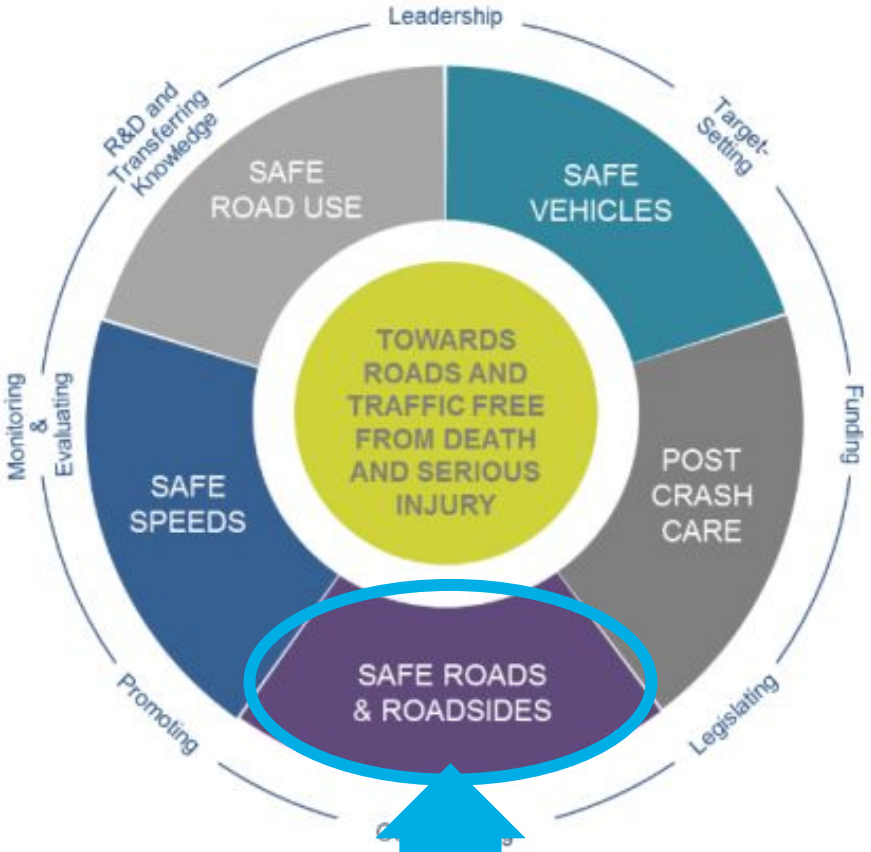
Source: ROSPA

Poll – Where is your organisation on the journey?

Traditional thinking….	Safe System thinking…
Some deaths are inevitable	Road deaths are preventable
Blame road users	Shared responsibility between road users, designers and managers
Focus on all crashes	Focus on fatal and serious injury crashes
Reactive to crashes	Proactive identification of risk
Individual elements	System working together

1 2 3 4 5

Safe System - Infrastructure



- Essential to reduce road trauma.
- Must eliminate or minimise risks for all road users, not just drivers.
- Must be designed to accommodate errors – humans make mistakes

Safe System Hierarchy of Treatments

Primary Treatment	• Road planning, design and management considerations that virtually eliminate the potential of fatal and serious injuries occurring in association with the foreseeable crash types	▪ Separate cycle path ▪ Very low speeds
Supporting (step towards)	• Road planning, design and management considerations that improve the overall level of safety associated with foreseeable crash types, but not expected to virtually eliminate the potential of fatal and serious injuries occurring • Improves the ability for a Primary Treatment to be implemented in the future	▪ Shared pedestrian / cyclist path ▪ Bicycle lane
Supporting Treatment	• Road planning, design and management considerations that improve the overall level of safety associated with foreseeable crash types, but not expected to virtually eliminate the potential of fatal and serious injuries occurring • Does not change the ability for a Primary Treatment to be implemented in the future	▪ Cyclist box ▪ Cyclist signals at intersections
Non-Safe System Treatment	• Road planning, design and management considerations that are **not expected to achieve an overall improvement in the level of safety** associated with foreseeable crash types occurring • **Reduces the ability for a Primary Treatment** to be implemented in the future	▪ Guardrail adjacent to lane

Source: https://austroads.com.au/publications/road-safety/ap-r560-18/media/AP-R560-18-Towards_Safe_System_Infrastructure_A_Compendium_of_Current_Knowledge.pdf

Head on crashes – median barrier

Higher risk

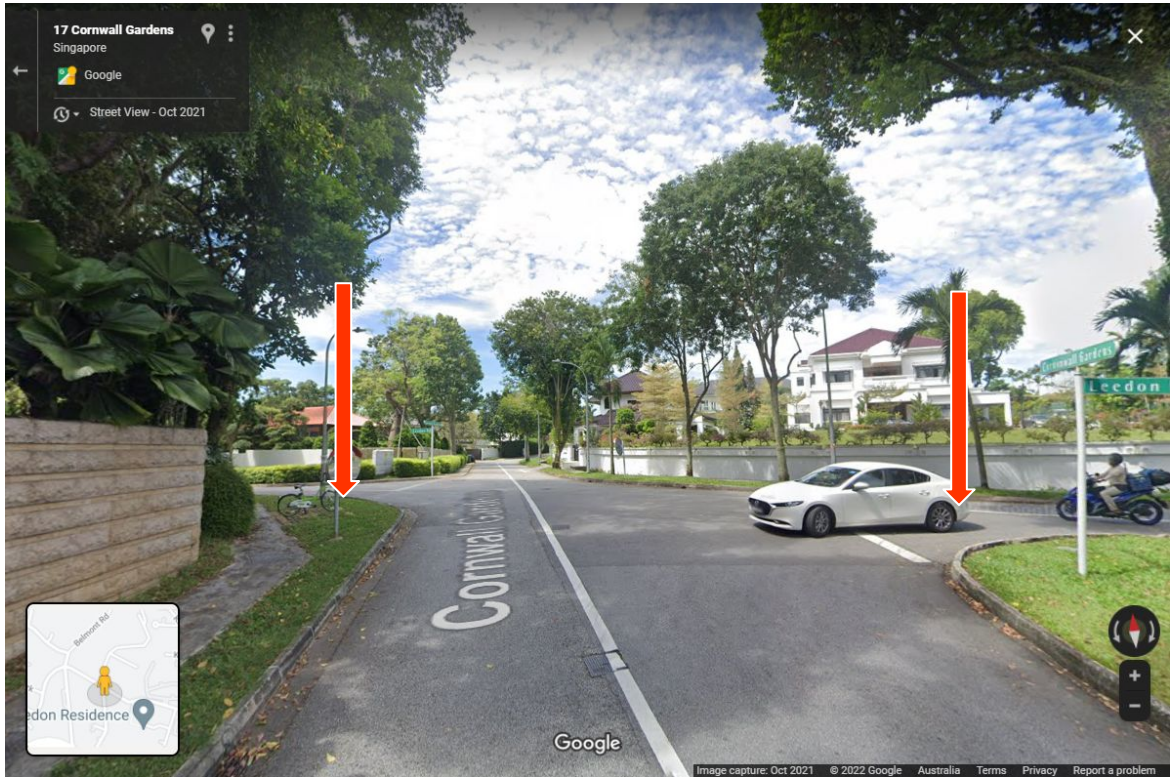
Lower risk

Head on crashes – wide centreline

Higher risk

Lower risk

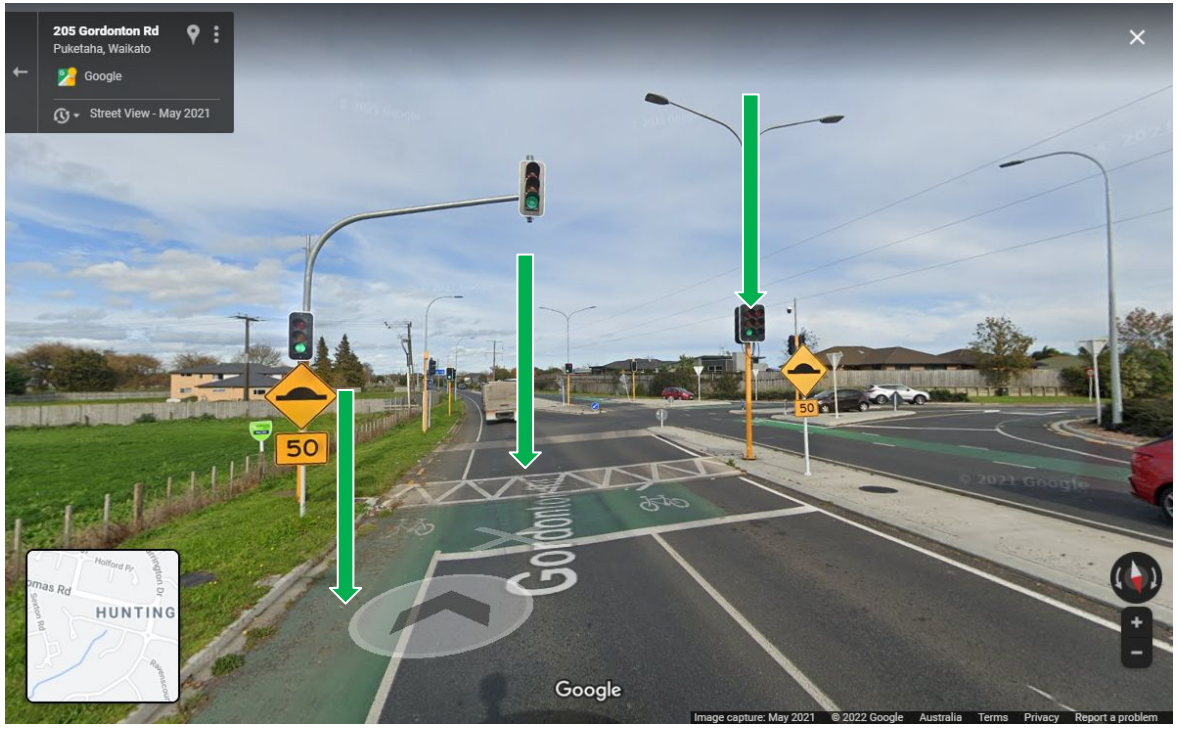
Intersection crashes – roundabout



Higher risk

Lower risk

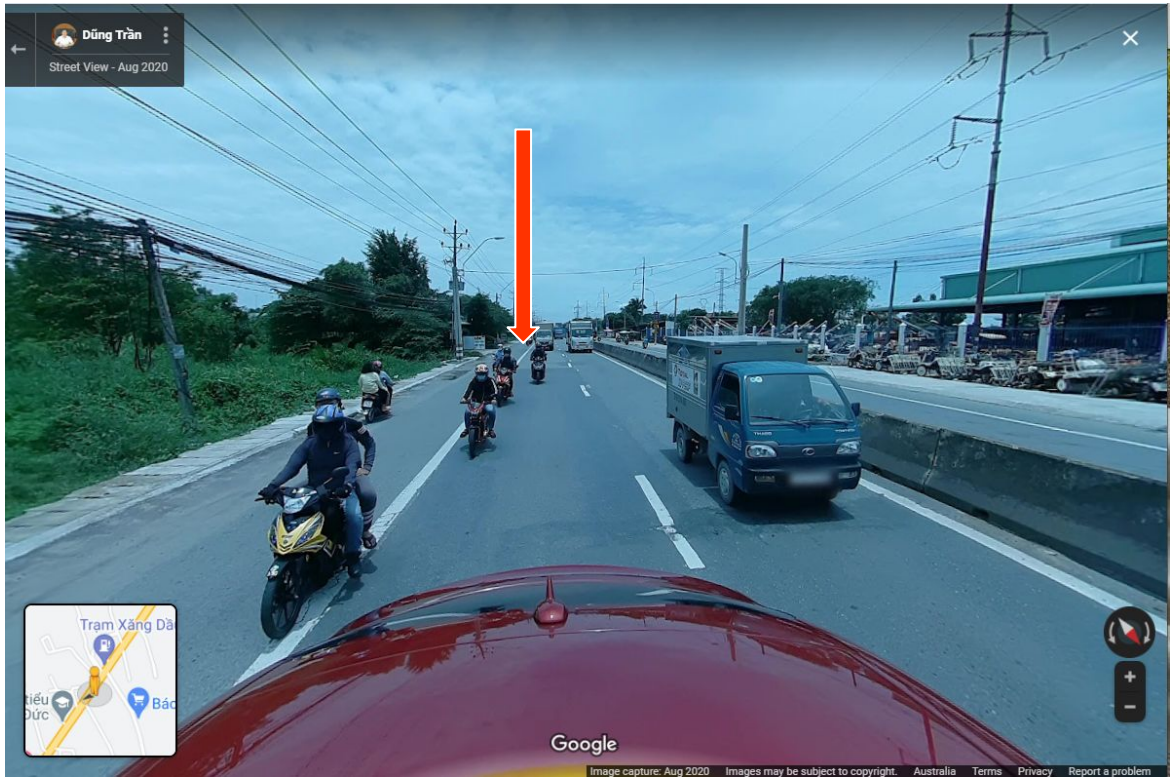
Intersection crashes – raised platform



Higher risk

Lower risk

Rear-end and side swipe crashes - motorcycles



Higher risk

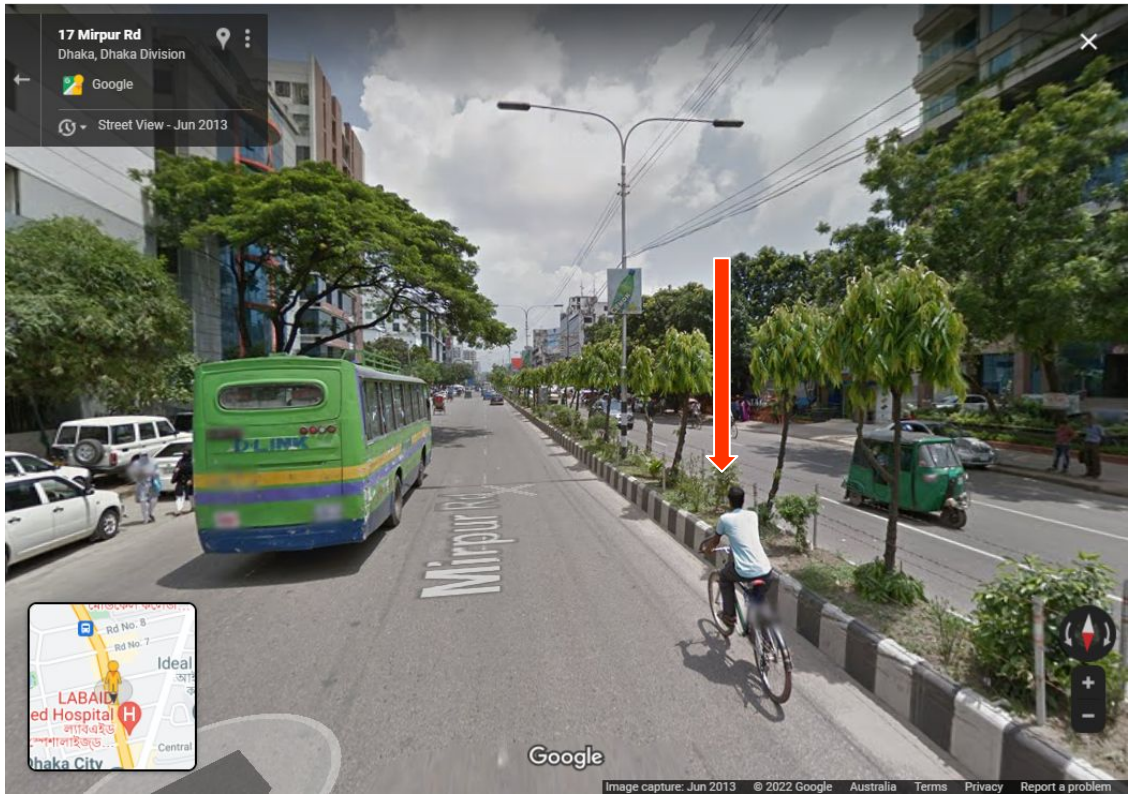
Lower risk

Motorcycle run-off-road crashes - barriers

Higher risk

Lower risk

Rear-end and side swipe crashes - bicycles



Higher risk

Lower risk

Rear-end and side swipe crashes - bicycles

Source: http://www.xinhuanet.com/english/2020-06/04/c_139113280.htm

Higher risk

Lower risk

Crossing crashes - pedestrians

Higher risk

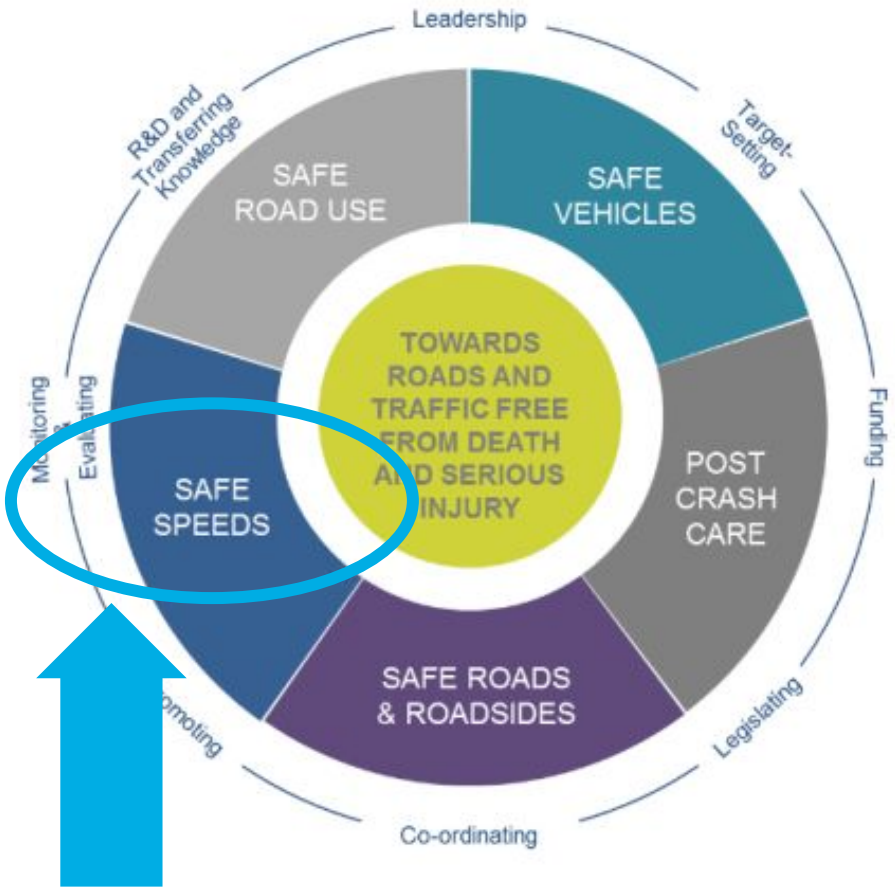
Lower risk

Crossing crashes - pedestrians

Higher risk

Lower risk

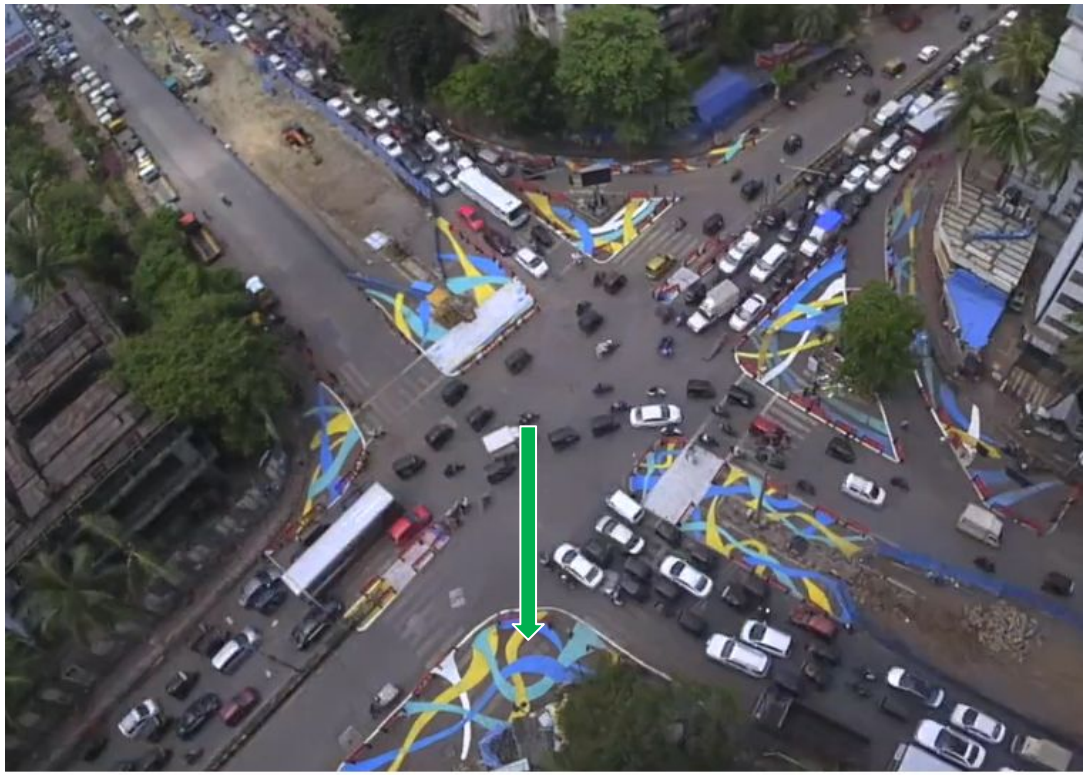
Safe System - Speeds



- Infrastructure can support slower speeds.
- ‘Self-explaining’ roads
- Encourages compliance.

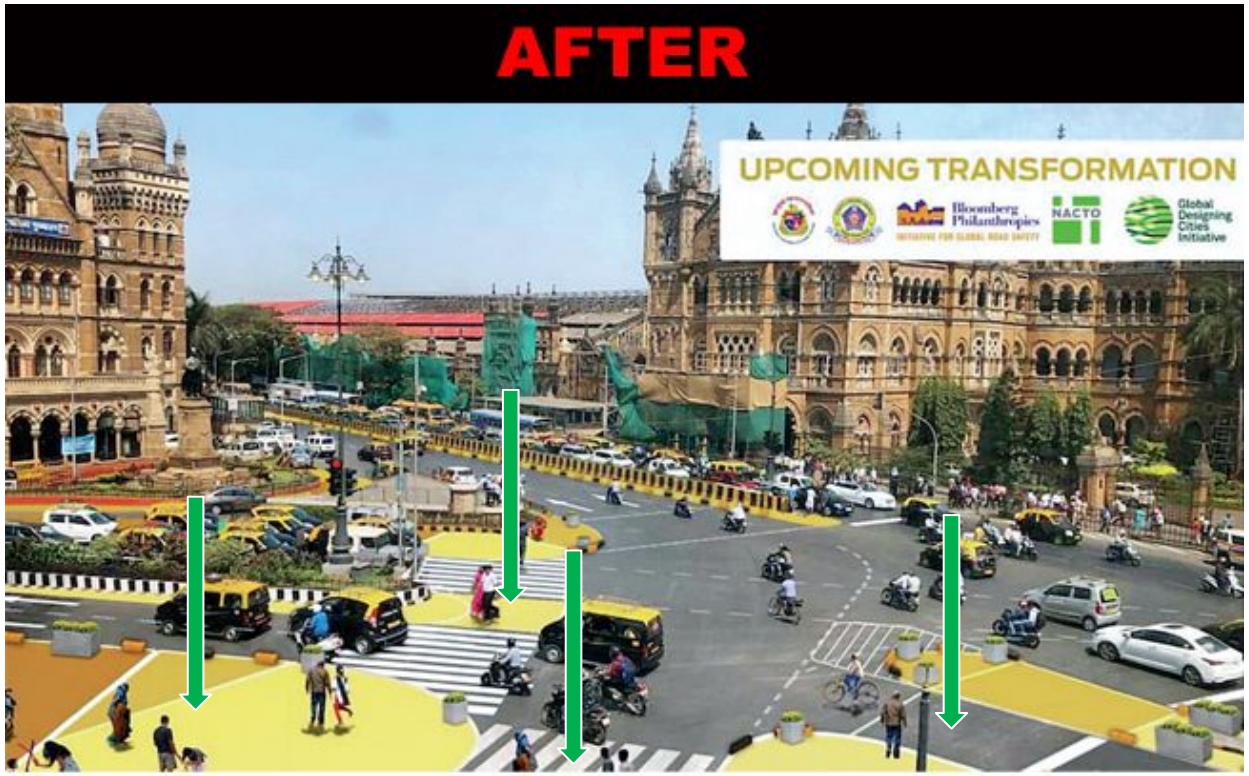
Safe speeds – infrastructure can support these

Source: https://thecityateyelevel.com/stories/walkability-in-asian-cities/



Source: https://globaldesigningcities.org/2017/06/06/making-mumbai-sts-safer-and-cooler/

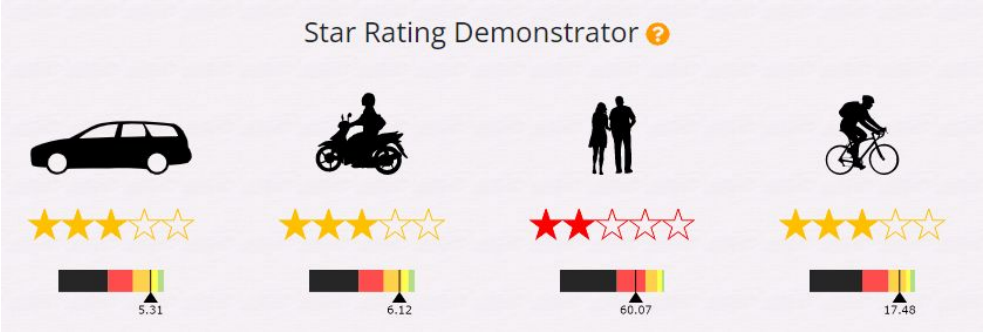
Safe speeds – infrastructure can support these



Source: https://mumbaimirror.indiatimes.com/mumbai/civic/times-square-makeover-for-csmt-intersection/articleshow/71713842.cms

How can we measure safety?

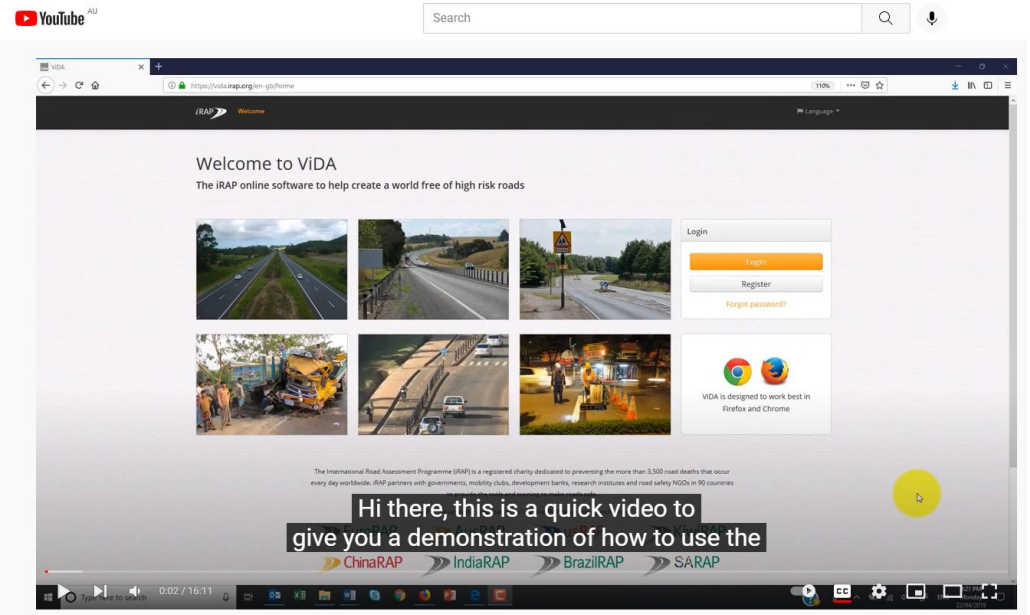
- iRAP's Star Rating Demonstrator
- Interactive tool
- Calculates star rating based on the infrastructure risk
- 1-star (least safe) to 5-stars (safest)
- Vehicles, motorcycles, bicycles and pedestrians



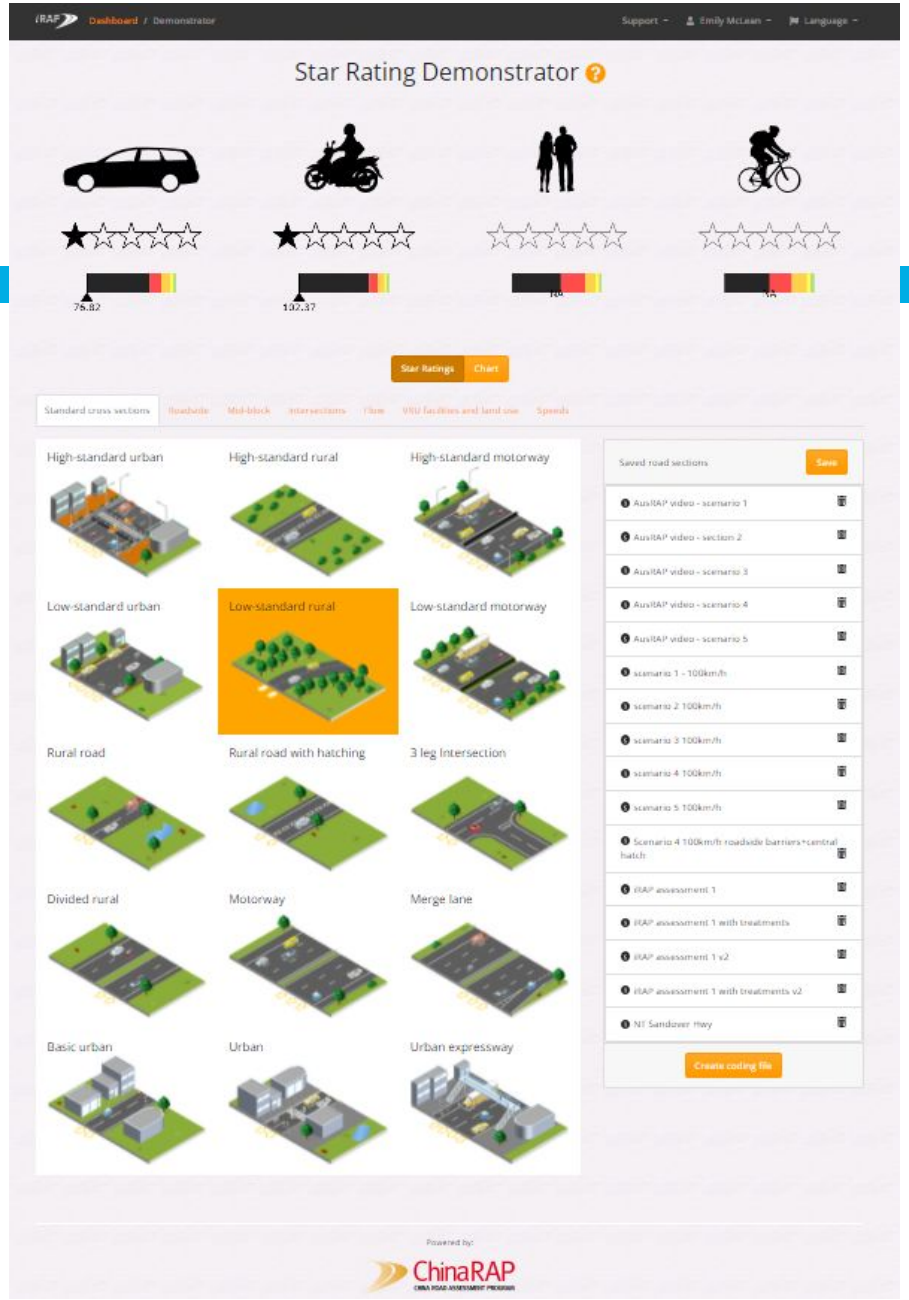
How can we measure safety?

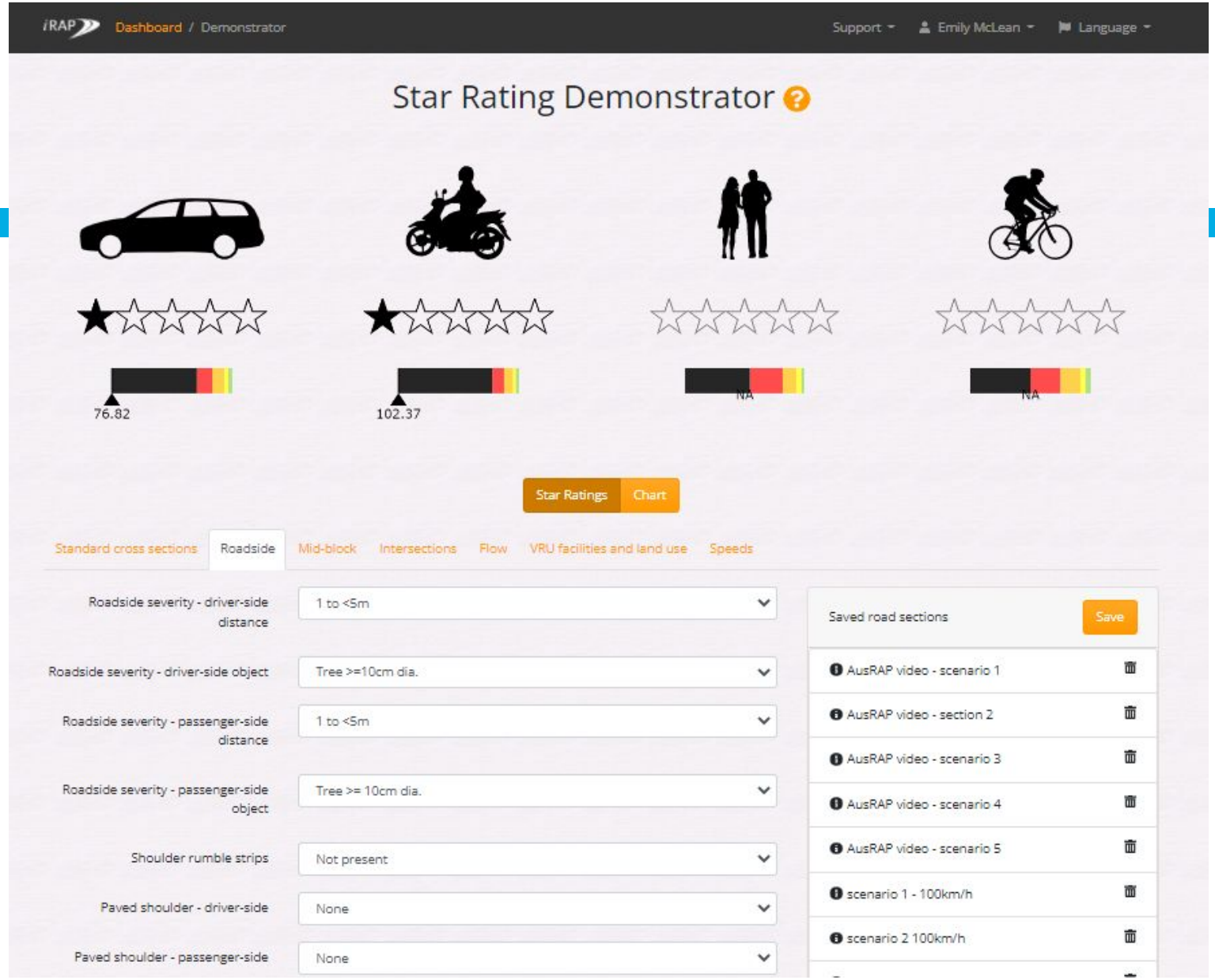
- Impact on safety of treatments can be investigated
- Available at: https://irap.org/project/star-rat
- Live demo:

https://youtu.be/fh1Bw_6OBz4

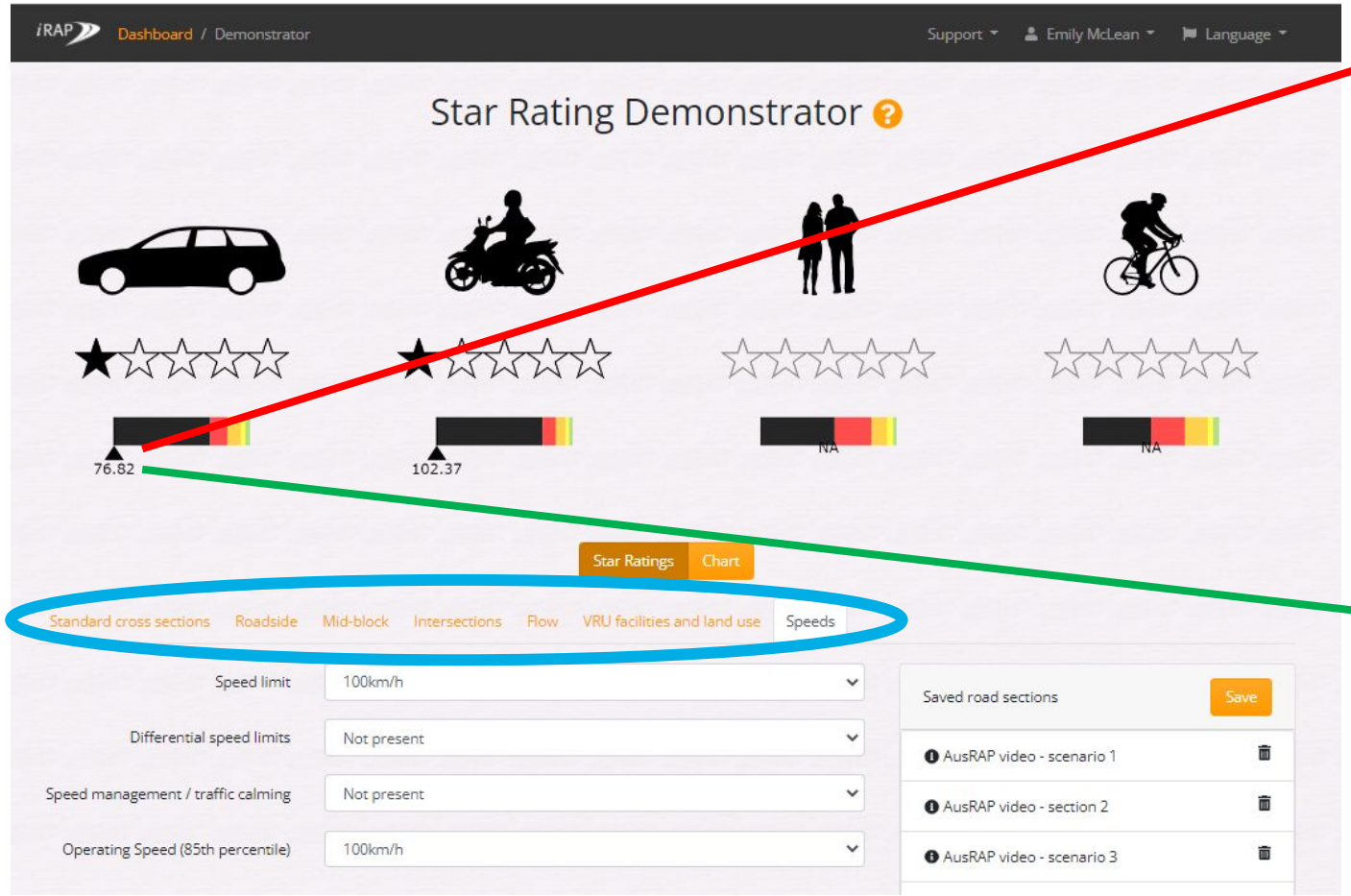


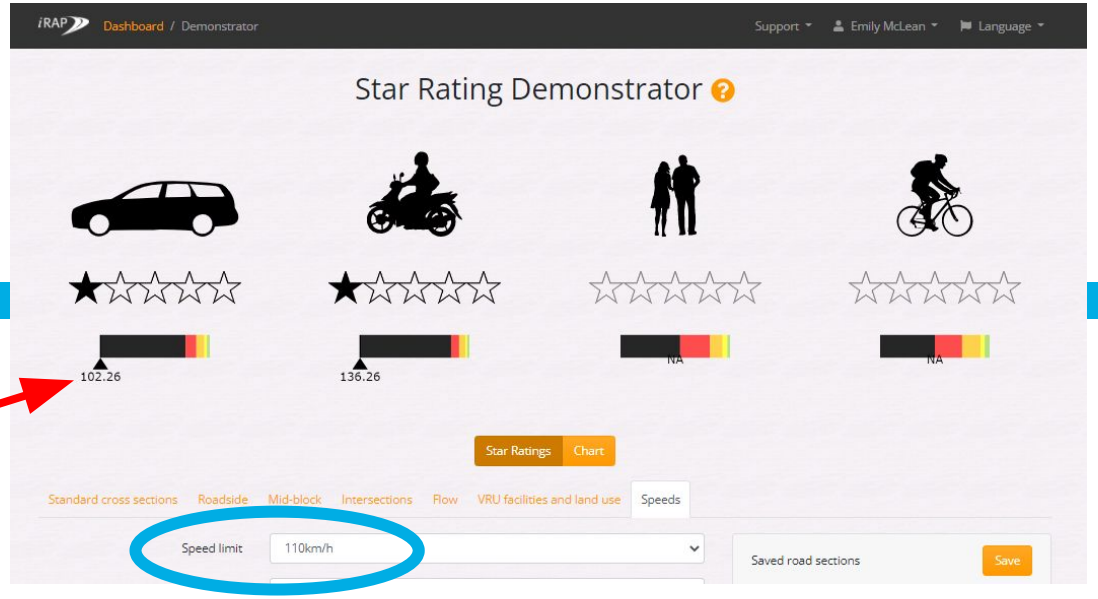
Using the Star Rating Demonstrator (extended version)

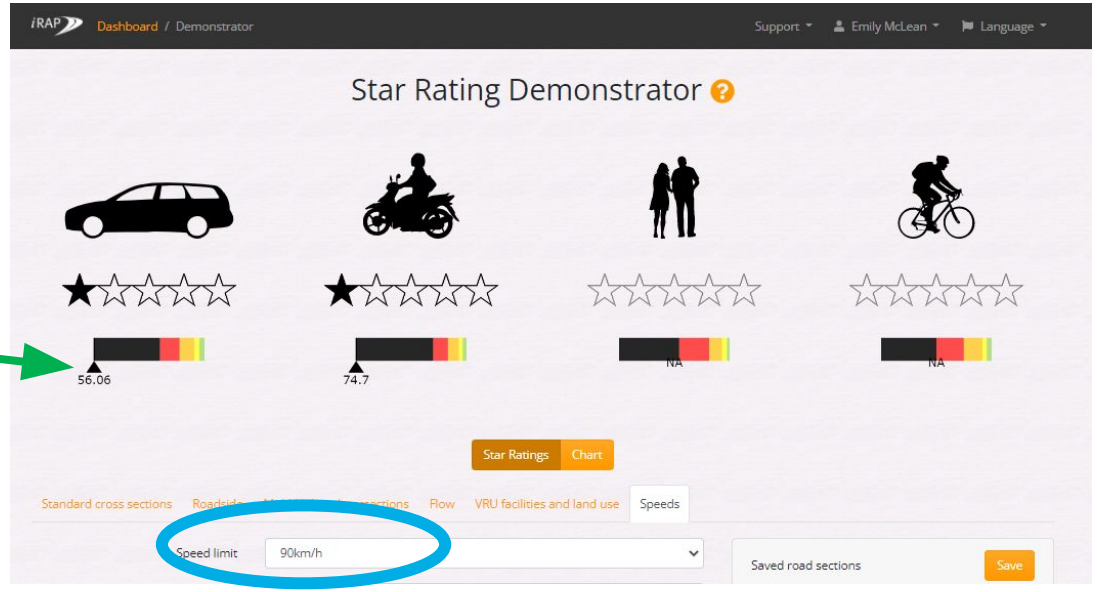




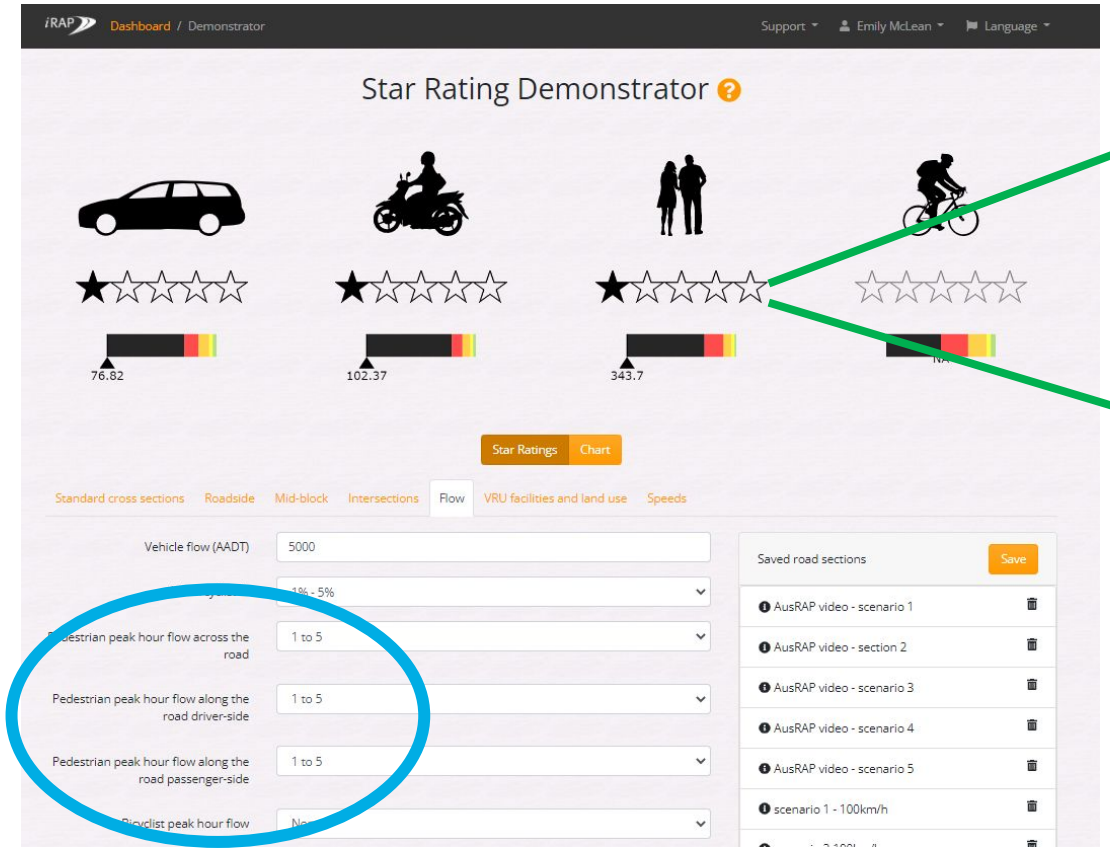
Change in speed limit

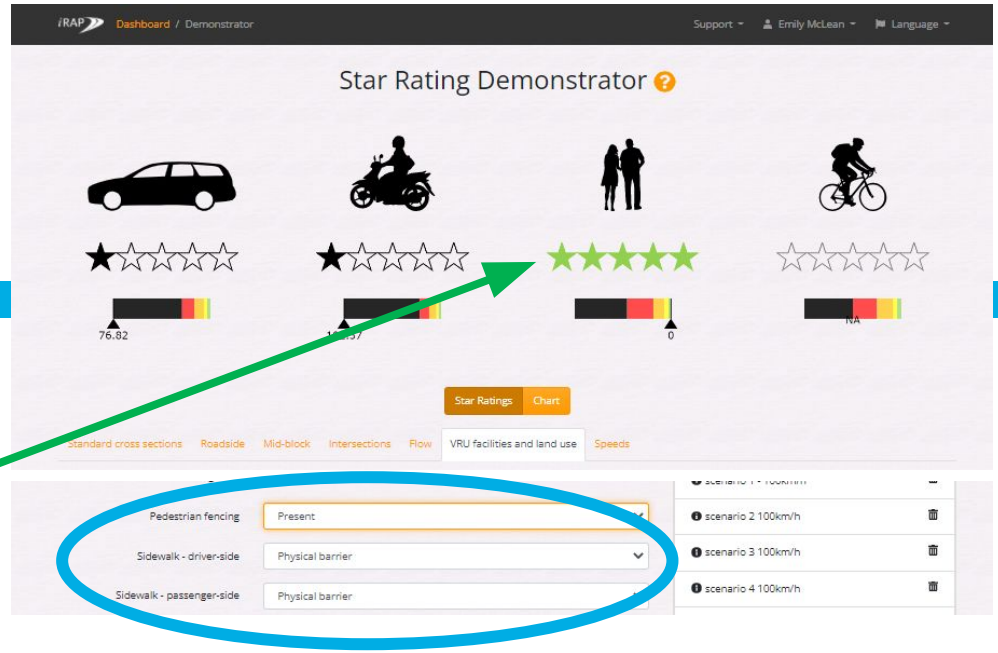


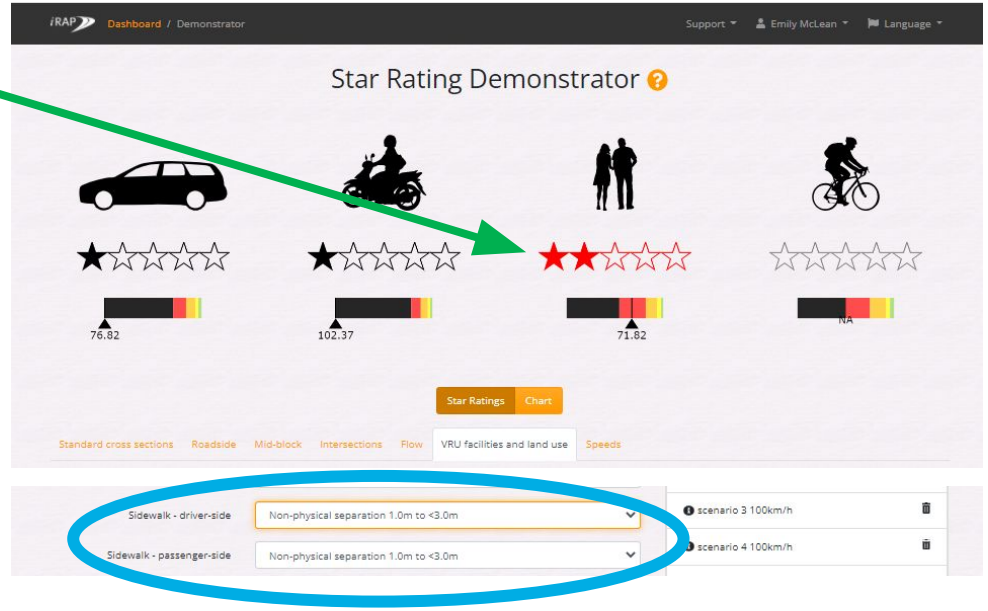




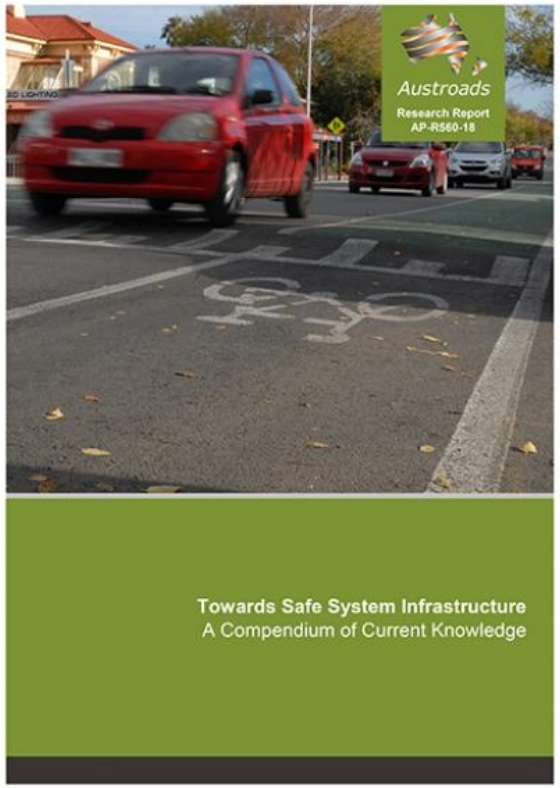
Treating pedestrian risk

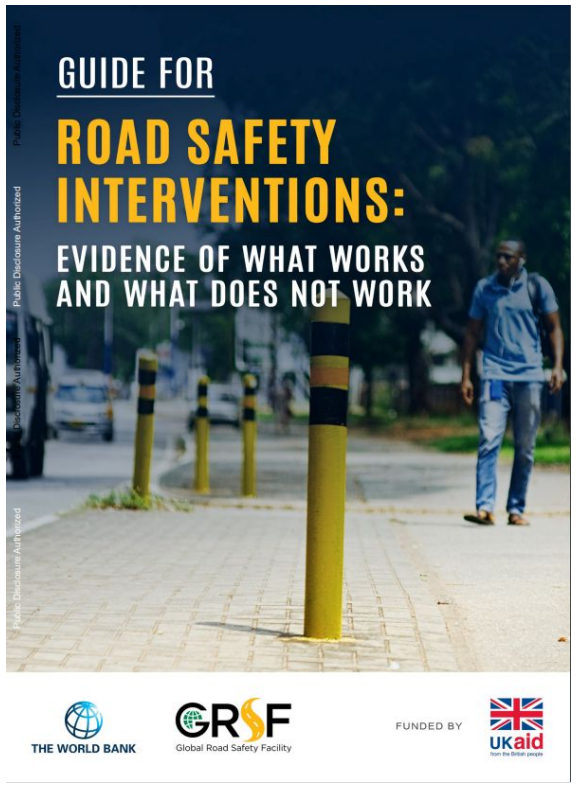


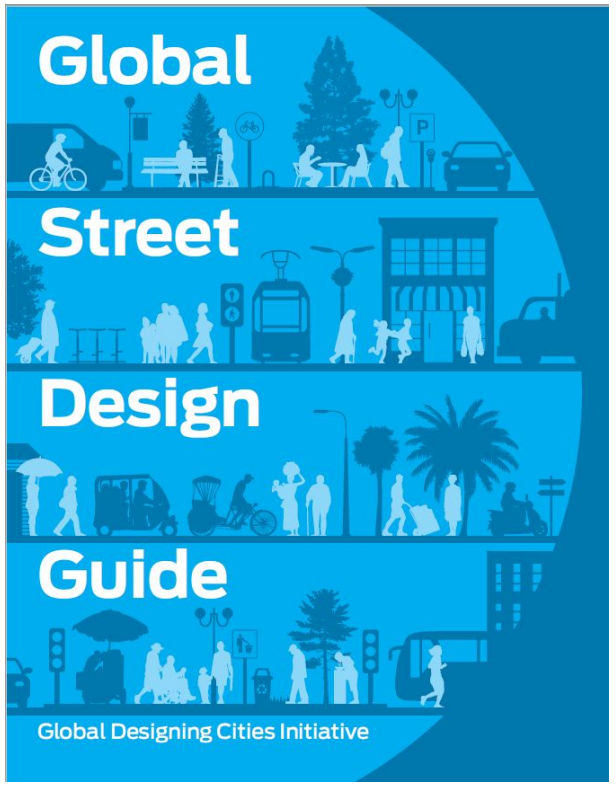


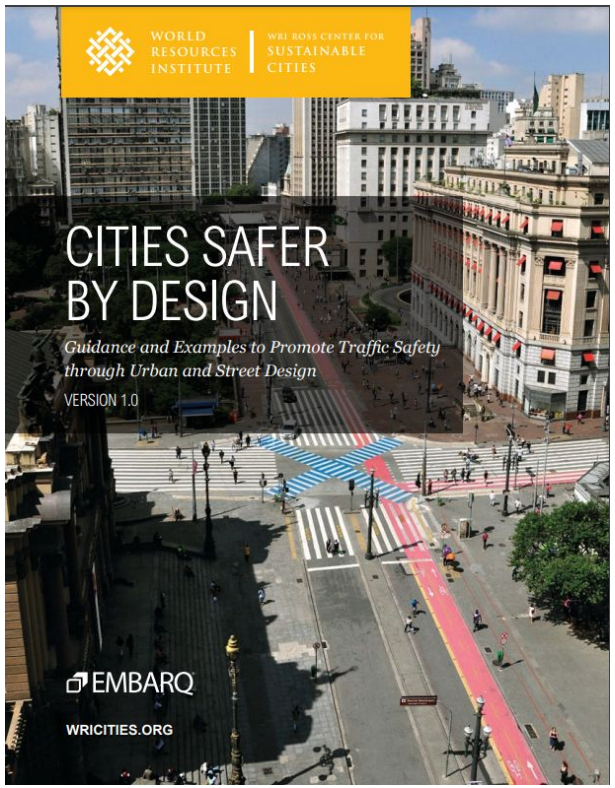


Further resources









https://austroads.com.au/latest-news/towards-safe-system-infrastructure
https://www.roadsafetyfacility.org/publications/guide-road-safety-interventions-evidence-what-works-and-what-does-not-work
https://globaldesigningcities.org/publication/global-street-design-guide/
https://www.wri.org/research/cities-safer-design

Questions?

Best practice examples in design standards and guides

Greg Smith, iRAP
Blair Turner, GRSF

DECADE OF ACTION FOR ROAD SAFETY 2021 - 2030

GLOBAL PLAN

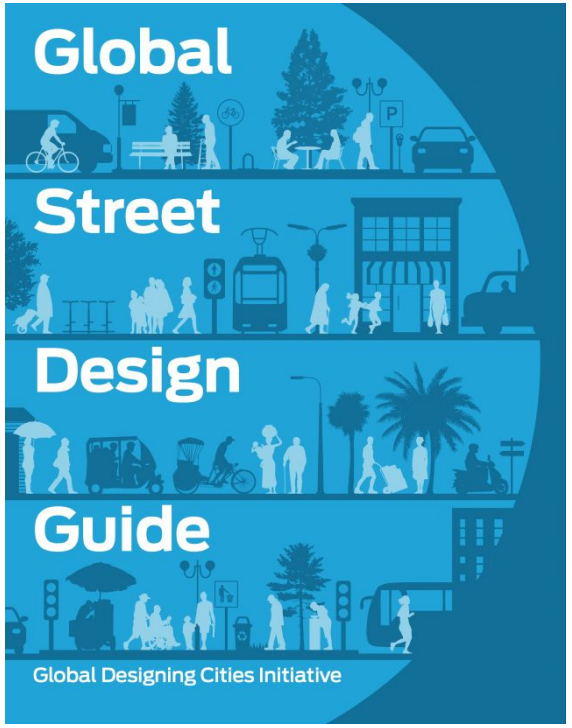
DECADE OF ACTION FOR ROAD SAFETY
2021–2030

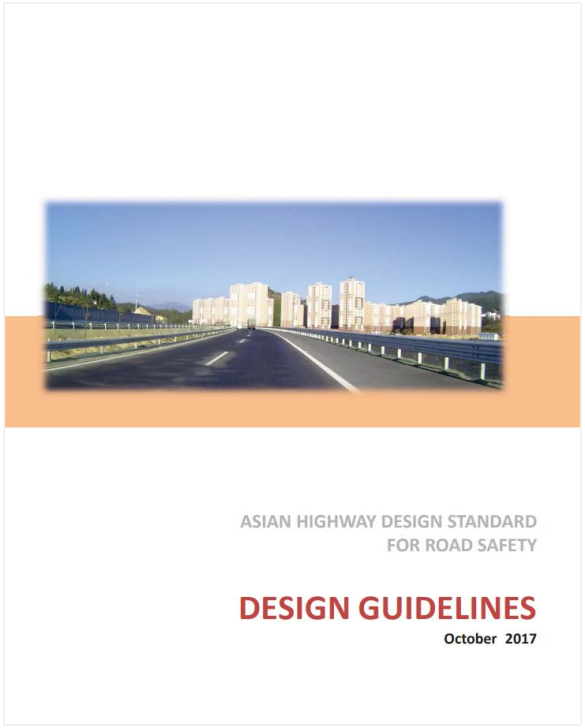
Box 2

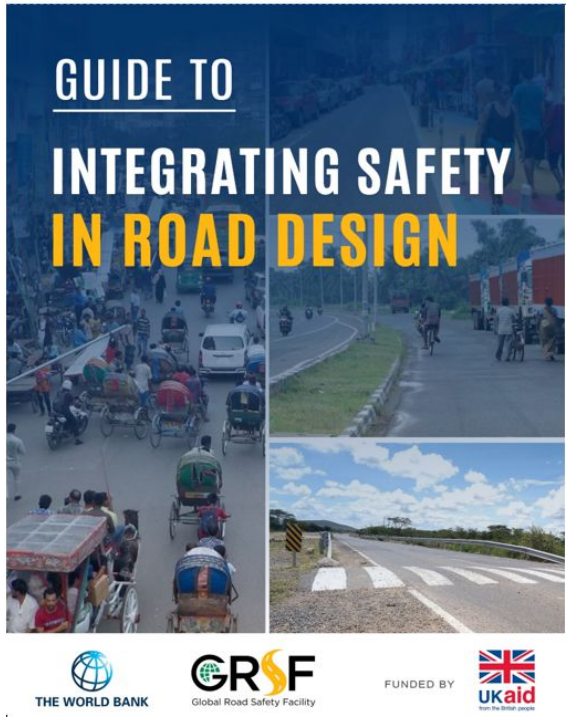
Recommended actions to improve the safety of road infrastructure

- Develop functional classifications and desired safety performance standards for each road user group at the geographic land-use and road corridor level.
- Review and update legislation and local design standards that consider road function and the needs of all road users, and for specific zones.
- Specify a technical standard and star rating target for all designs linked to each road user, and the desired safety performance standard at that location.
- Implement infrastructure treatments that ensure logical and intuitive compliance with the desired speed environment (e.g. 30 km/h urban centres; ≤ 80 km/h undivided rural roads; 100 km/h expressways).
- Undertake road safety audits on all sections of new roads (pre-feasibility through to detailed design) and complete assessments using independent and accredited experts to ensure a minimum standard of three stars or better for all road users.
- Undertake crash-risk mapping (where crash data are reliable) and proactive safety assessments and inspections on the target network with a focus on relevant road user needs as appropriate.
- Set a performance target for each road user based on the inspection results with clear measurable metrics at the road-attribute level (e.g. sidewalk provision).

Guides to Support Safe Design







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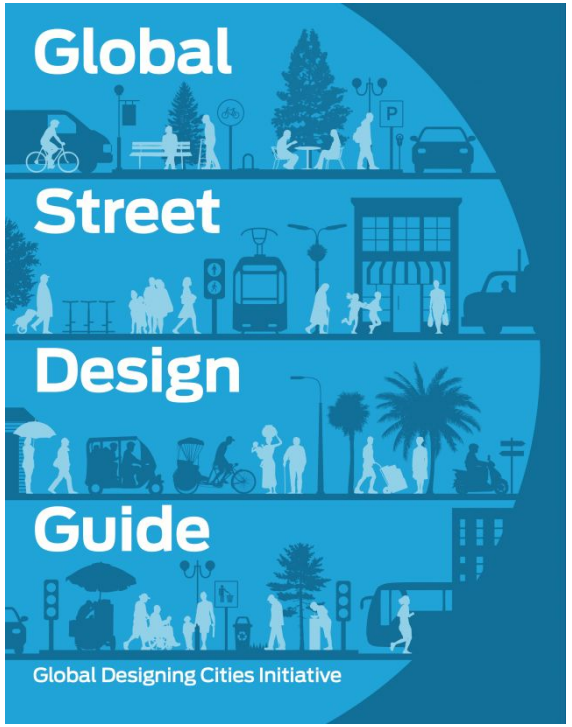
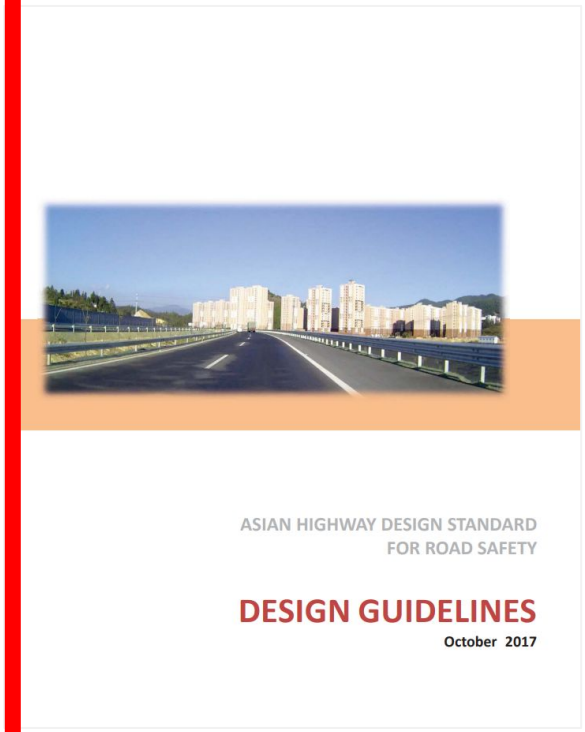
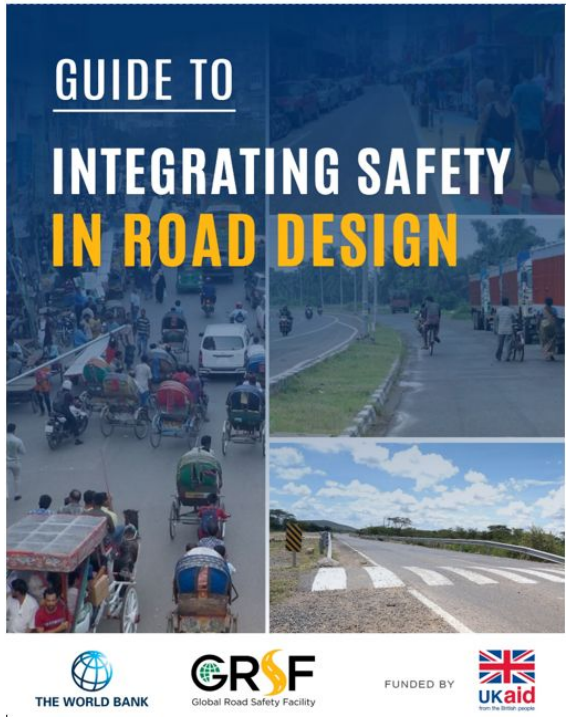
GLOBAL ROAD SAFETY PARTNERSHIP

Guides to Support Safe Design







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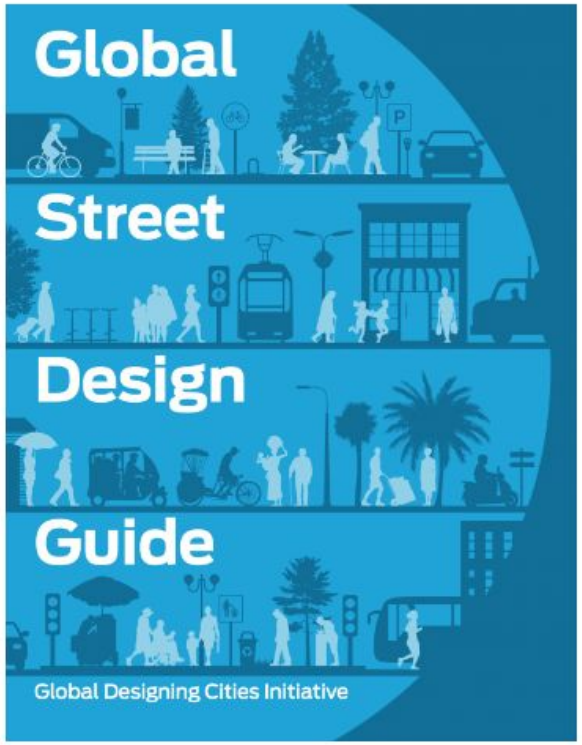

Global Street Design Guide

English | Español | Italiano | 中文 | Português | Türkçe

The Global Street Design Guide is supporting practitioners to redefine the role of streets in cities around the world. Created with the input of experts from 72 cities in 42 countries, the Guide offers technical details to inform street design that prioritizes pedestrians, cyclists, and transit riders.

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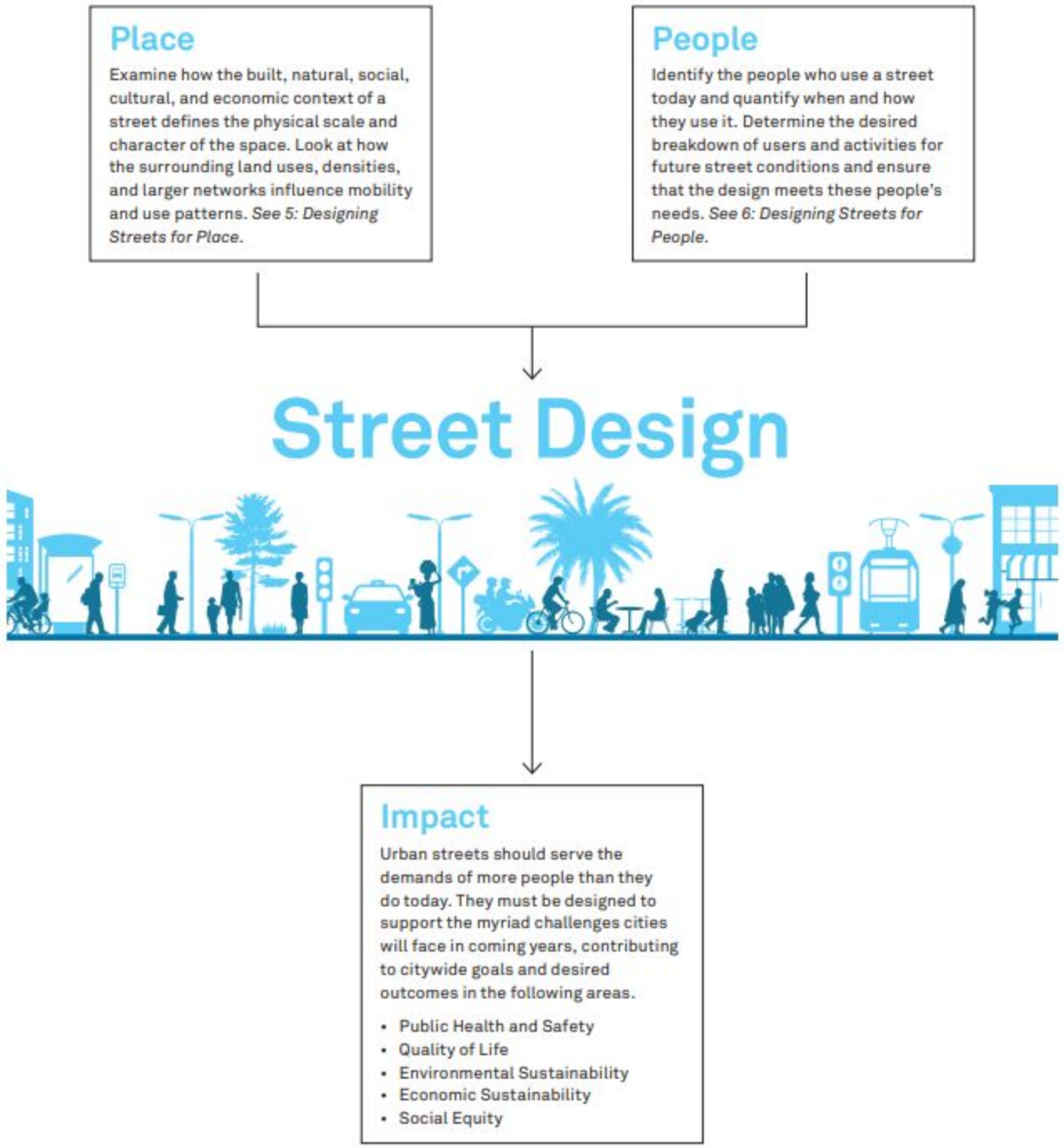
Endorsement Letter

https://globaldesigningcities.org/publication/global-street-design-guide/

People and Place



https://globaldesigningcities.org/publication/global-street-design-guide/

The Economy of Streets and Environmental Sustainability

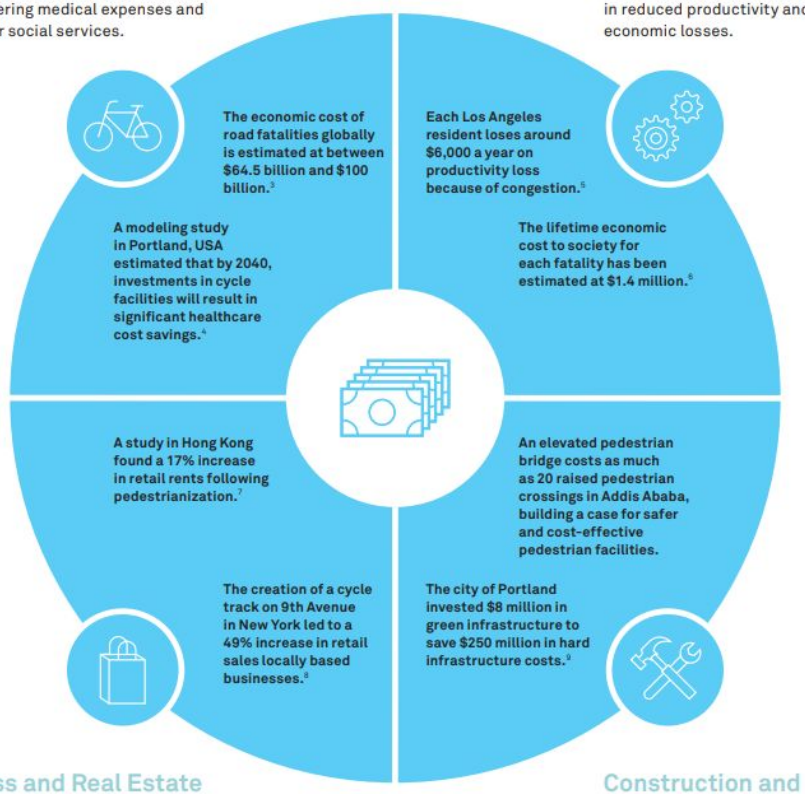
https://globaldesigningcities.org/publication/global-street-design-guide/

Health and Human Lives

The cost of lives lost and serious injuries caused by road crashes have a significant impact on the economy. Better-designed streets relieve mental and physical stress, lowering medical expenses and the need for social services.

Work and Productivity

Significant numbers of human working hours are lost as a result of time spent in congestion or injuries incurred in road crashes. These lost hours result in reduced productivity and, therefore, economic losses.



Business and Real Estate

Pedestrians, cyclists, and transit riders generally spend more money at local retail businesses than people who drive cars, underscoring the importance of offering attractive, safe spaces for transit riders, pedestrians, and cyclists. Great streets have also been shown to add value to neighborhoods.

Construction and Maintenance

Narrow streets cost less to build and maintain. Using good-quality, durable materials can significantly reduce maintenance costs. Green alleys or streets and tree planting are estimated to be 3-6 times more effective in managing stormwater and reduce hard infrastructure cost.[10]

Microclimate

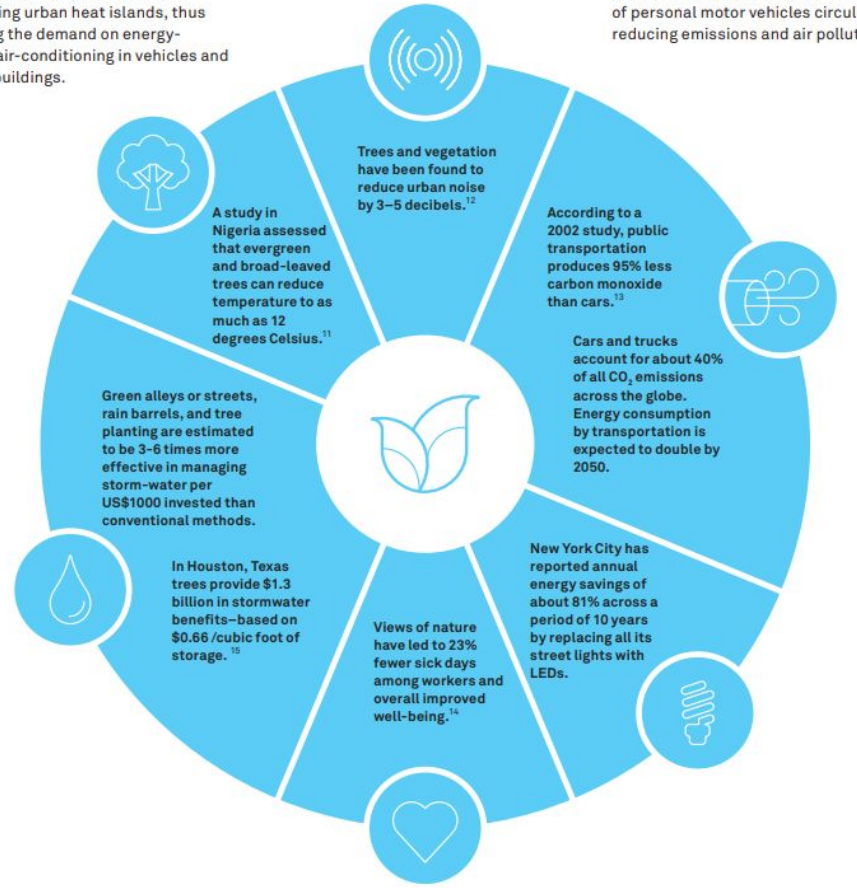
Street trees and landscaping can assist in improving the local climate and reducing urban heat islands, thus minimizing the demand on energy-intensive air-conditioning in vehicles and adjacent buildings.

Noise

Urban trees can reduce noise pollution.

Air Quality

Streets prioritizing pedestrians, cyclists, and transit help to reduce the number of personal motor vehicles circulating , reducing emissions and air pollution.



Water Management

Incorporating green infrastructure strategies and local plant species within streets helps manage stormwater and reduces irrigation needs. *See 7: Utilities and Infrastructure.*

Health and Safety

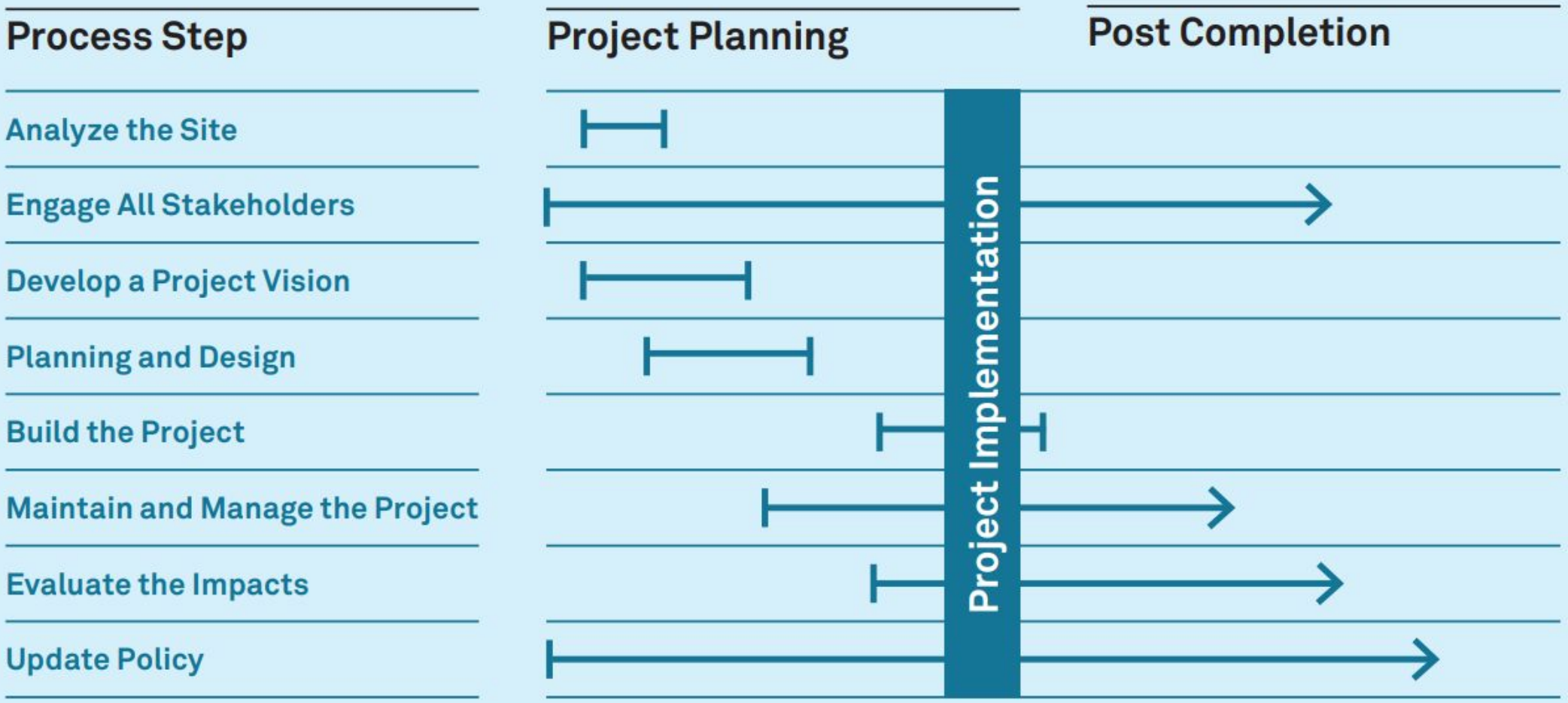
Urban trees and vegetation help decrease stress and aggressive behavior in cities[16] and have been linked to crime reduction.[17]

Energy Efficiency

Street projects can contribute to improving a city's energy and resource efficiency by using recycled and low-impact materials and technologies as well as renewable energies.

A TYPICAL PROCESS FOR SHAPING STREETS

While local processes vary in each context, use the typical steps in the diagram below to define and guide the process for each project before it begins. Street design is an iterative process. Processes should remain flexible and relevant, evolving and adapting over time as best practices, specific challenges, and contexts change. Use the following steps to guide the process of shaping streets.



https://globaldesigningcities.org/publication/global-street-design-guide/

Existing Conditions iRAP Star Rating

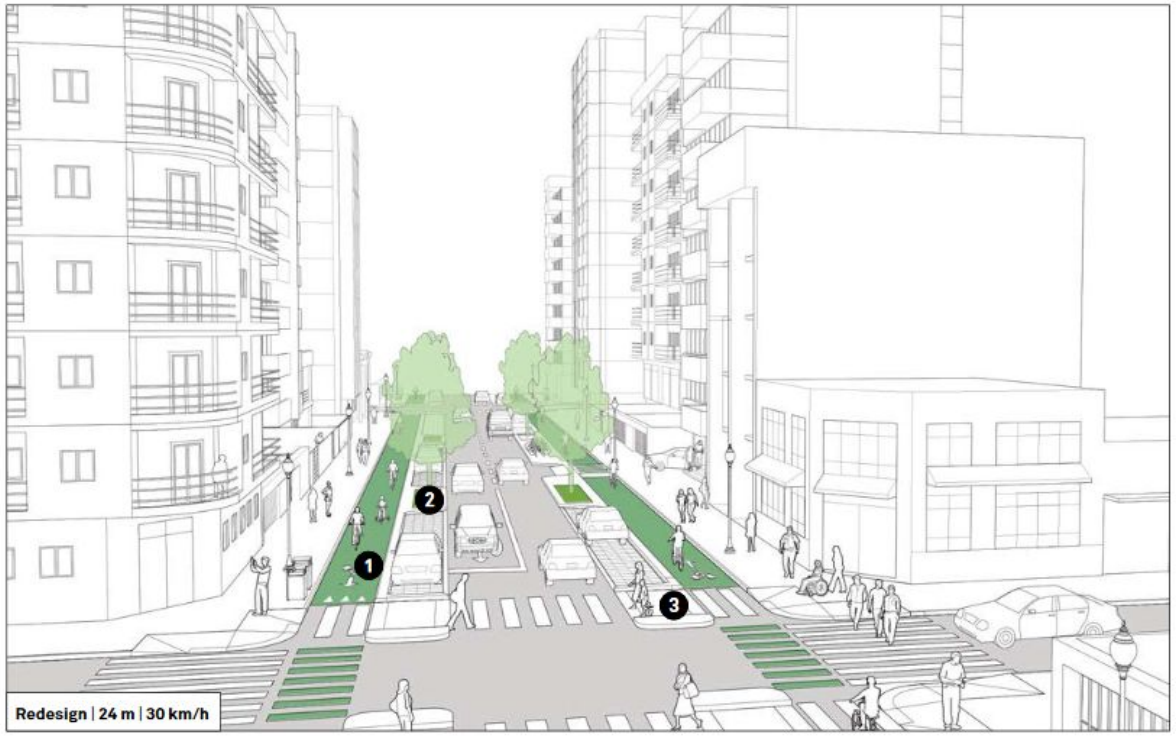
Street Only

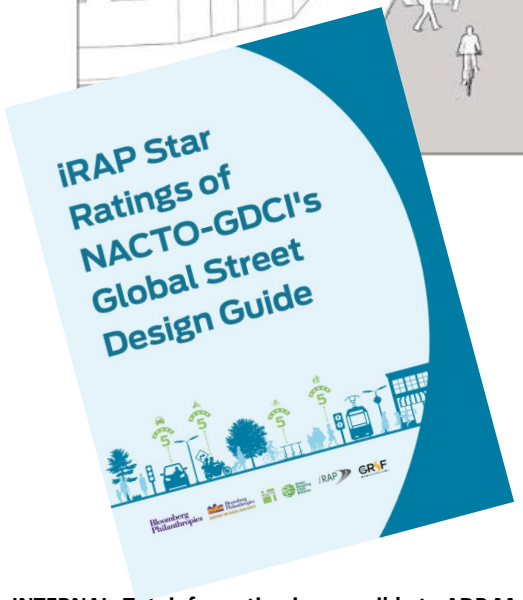
The Intersection

Redesign iRAP Star Rating

Street Only

The Intersection



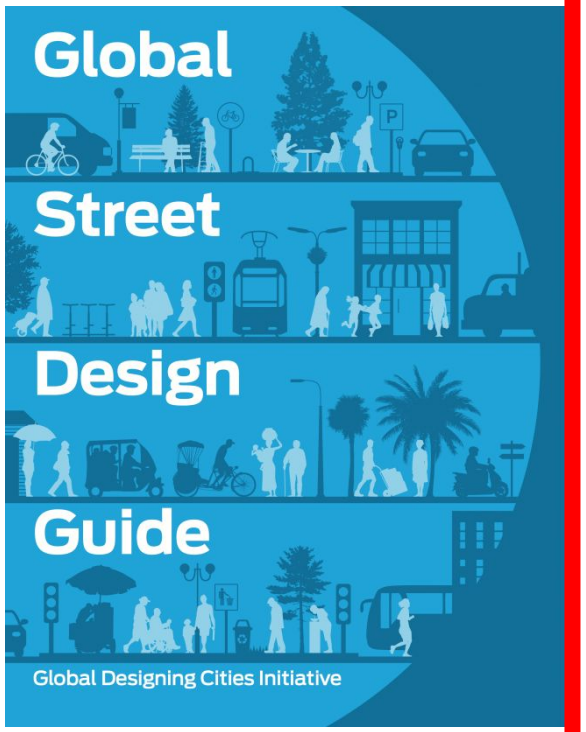


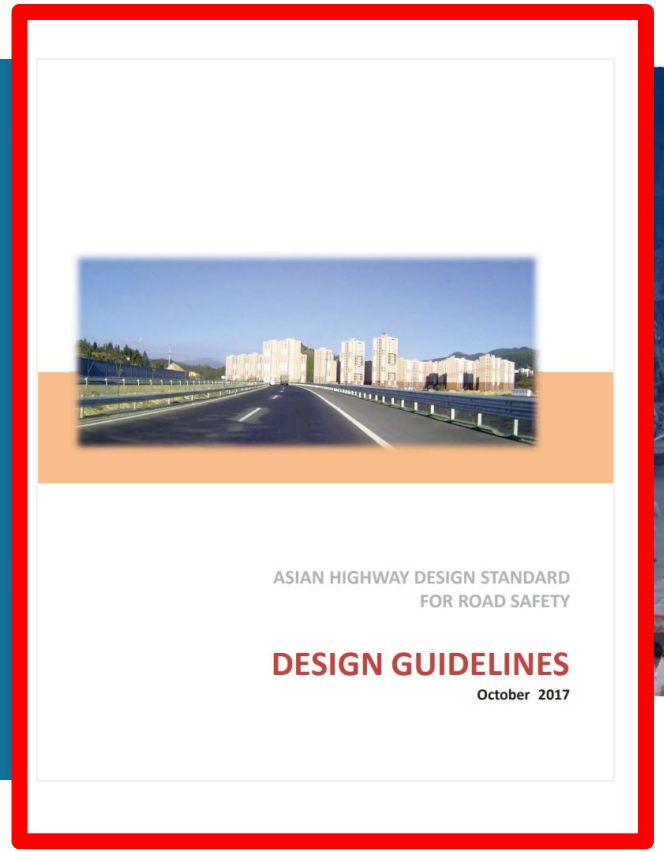
Global Designing Cities Initiative

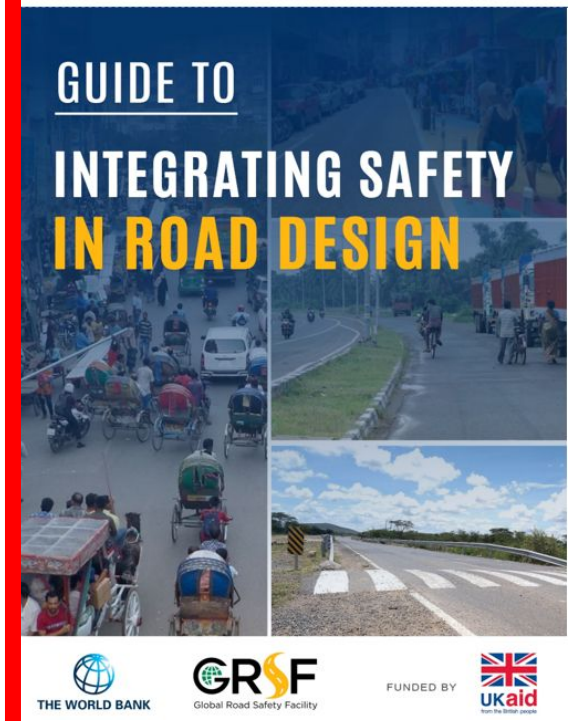
https://www.irap.org/street-design-guide

ASIA-PACIFIC ROAD SAFETY OBSERVATORY · ADB · THE WORLD BANK · GRSF Global Road Safety Facility · Bloomberg Philanthropies INITIATIVE FOR GLOBAL ROAD SAFETY · iRAP · GLOBAL ROAD SAFETY PARTNERSHIP

Guides to Support Safe Design

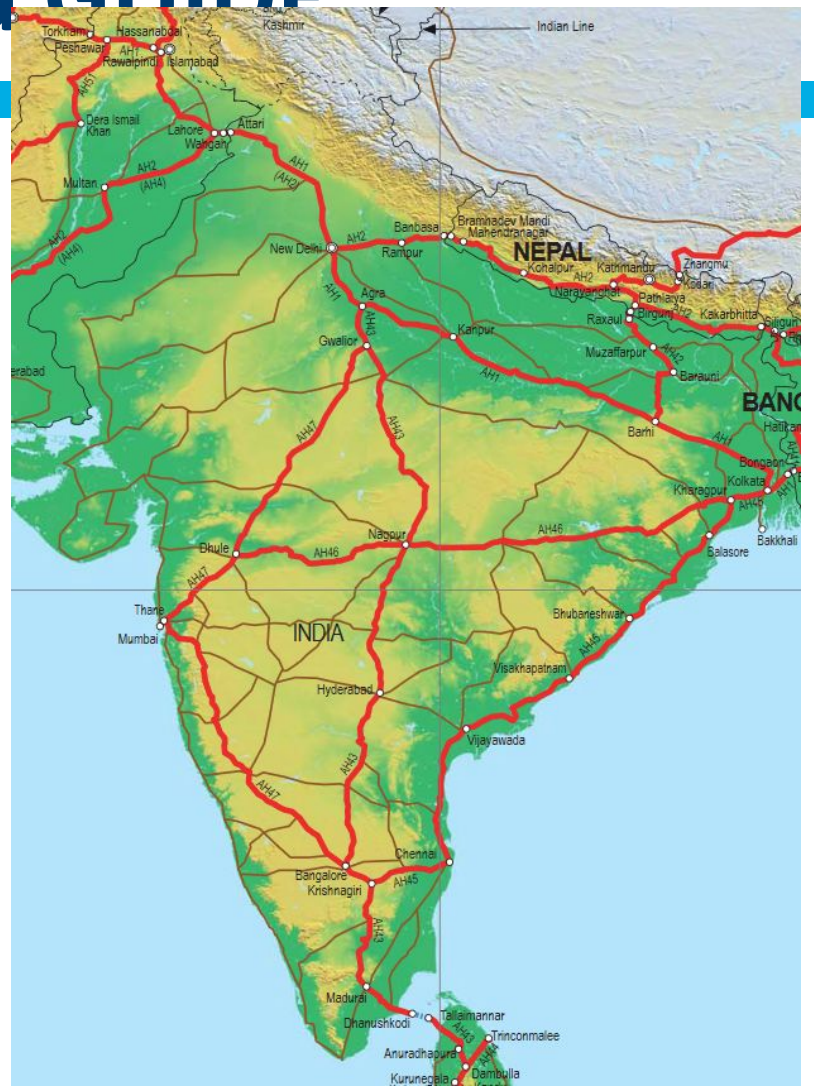






Asian highway network Standard and GUIDE

- 145,000 km / 32 countries
- UNESCAP Working Group on the Asian Highway Network meets biennially
- Designed to support achievement of UN Targets 3 and 4
- Primary, Class I, II and III
- Entered into force: 26 October 2018
- Targets Asian Highway network but can be used as a reference for all highways



https://www.unescap.org/resources/intergovernmental-agreement-asian-highway-network

https://www.aprso.org/data-knowledge

UNITED NATIONS ESCAP
Economic and Social Commission for Asia and the Pacific

DECADE OF ACTION

ABOUT COMMISSION 2030 AGENDA OUR WORK KN

Knowledge-Products

Download

ADDITIONAL MATERIALS

Intergovernmental Agreement on the Asian Highway Network - Chinese

Intergovernmental Agreement on the Asian

AH Design Standards for Road Safety - Adopted Annex II bis.pdf

CONTACT

Transport Division

+66 2288 1234

escap-td@un.org

Intergovernmental Agreement on th Highway Network

09 February 2016

The Intergovernmental Agreement on the Asian Highway Network is the first treaty to l auspices of the UNESCAP secretariat and deposited with the Secretary-General of the

It provides a framework for coordinated development of the international highways in E ope, giving the member countries a platform to discuss technical and institutional i n work and increase the efficiency of its operation.

T e Agreement is an important tool to facilitate international trade and tourism, promo nance international cooperation.

It was adopted on 18 November 2003 by an intergovernmental meeting held in Bangko 2004 in Shanghai and entered into force on 4 July 2005.

Status of signatories/parties

Latest status of the Intergovernmental Agreement on the Asian Highway Network

Share this article

ASIA-PACIFIC ROAD SAFETY OBSERVATORY

Home About APRSO News &

Reports | 31 December 2017

As one of the initiatives towards sustainable transport connectivity in Asia and the Pacific, the ESCAP secretariat, in association with the Korea Expressway Corporation conducted a study on the development of model ITS deployments for the Asian Highway network during 2015-2017. Under the study, the secretariat collected information on deployment of intelligent transport systems in China, Republic of Korea, Russian Federation and Turkey.

Development of Road Infrastructure Safety Facility Standards for the Asian Highway Network

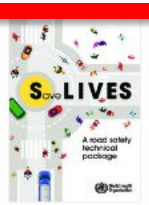
Studies | 31 December 2017

This report documents the findings of a study on the development of technical standards and design guidelines regarding infrastructure safety facilities of Asian Highways

Asian Highway Design Standard for Road Safety: Design Guidelines

Guides | 31 October 2017

This document consists of recommended guidelines related to the "Asian Highway Design Standard for Road Safety" to the Intergovernmental Agreement on the Asian Highway Network.



Save lives: a road safety technical package

Guides | 7 October 2017

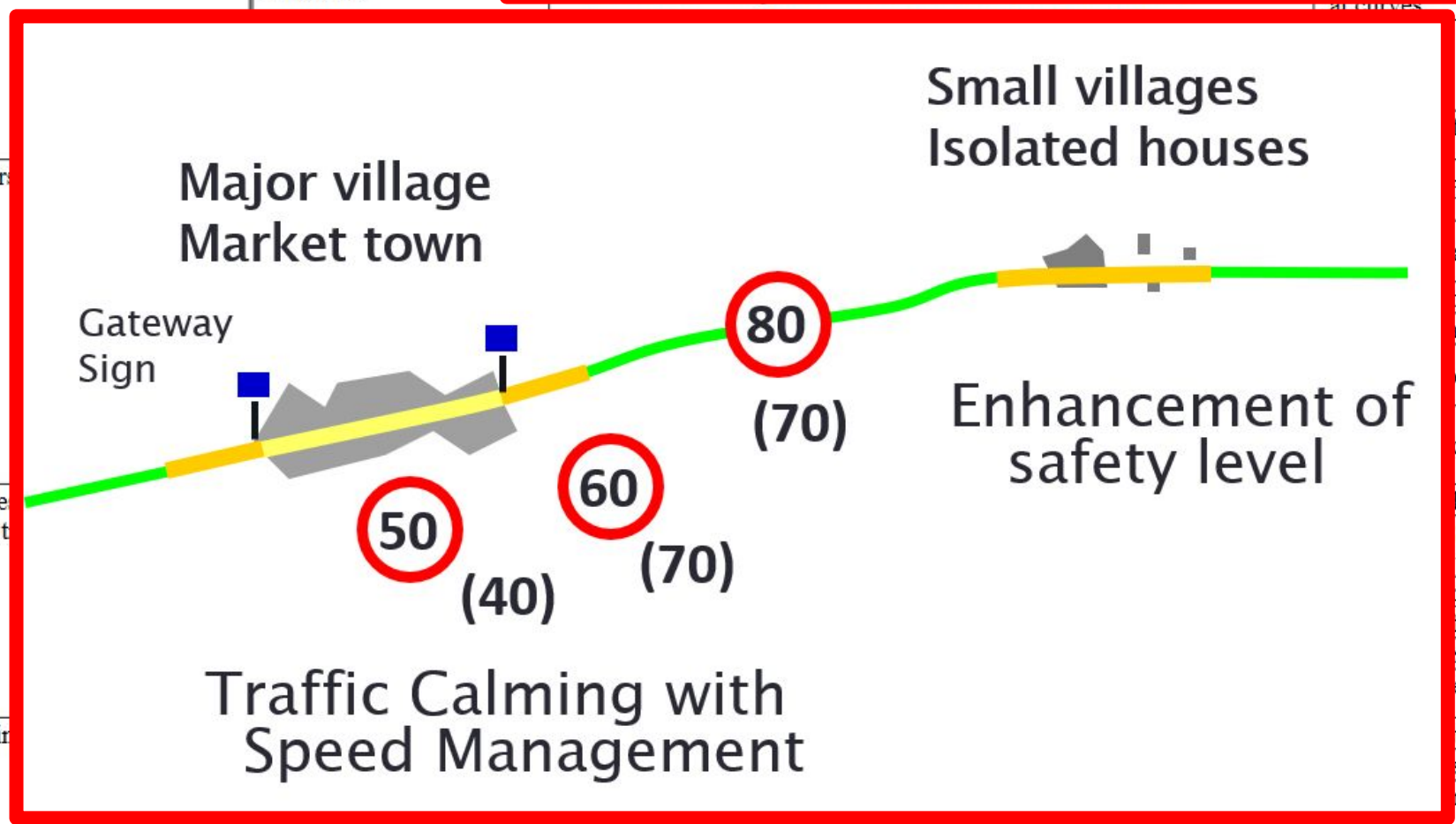
Save LIVES: a road safety technical package is an evidence-based inventory of priority interventions with a focus on Speed management, Leadership, Infrastructure design and improvement, Vehicle safety standards, Enforcement of traffic laws and post-crash Survival.

« First ‹‹ 1 2 3 4 5 6 7 ›› Last »

Topics	Highway classification	Primary[1]				Class I			Class II				Class III			
	Design speed (km/h)	120	100	80	60	100	80	50	80	60	50	40	60	50	40	30
Road infrastructure	Curve	Coordination of neighbouring curve radii				Avoidance of isolated sharp curves			Avoidance of isolated sharp curves; hairpins subject to comprehensive treatments							
	Overtaking section	Possible restriction for unfavourable alignment and tunnel							Systematic overtaking management							
	Long steep grade	Strategic measures				Comprehensive measures				Comprehensive measures depending on circumstances						
	Climbing lane															ns
	Parking facility	area/emergency layby				Possible service area for Class I roads, rest area/parking layby/emergency layby/bus facility/filling station										
Roadside safety	Roadside	Clear zone or safety barrier with transition and end treatment							Clear zone or safety barrier with transition, end treatment particularly at curves							
	Median	Wide median or median safety barrier				Median with segregation and/or safety barrier			Wide centreline		Centreline					
	Intersections	Clear zone or crash cushion at diverge gores						Possibly clear zone at intersections								
Intersections	Priority intersection	Not applicable				Protected offside turn lane subject to conditions			Protected offside turn lane generally appropriate							
	Side road Channelization island					Side road channelization island generally appropriate										
	Roundabout					Roundabout subject to conditions			Roundabouts generally appropriate at major intersections and crossroads							
	Signalized intersection					Signalized intersection generally appropriate at major intersections and crossroads										
	U-turn facility					Systematic provision of U-turn facilities			U-turn opportunities as needed							
	Grade-separation	Grade-separation only				Grade-separation desirable at higher traffic volume			Generally not applicable							
Pedestrians, slow vehicles and traffic calming	Pedestrian footpath	Not applicable				Footpath where pedestrians are present, segregated footpaths for high traffic speeds or traffic volume										
	Pedestrian/slow vehicle crossing	Grade-separated				Grade-separated or signalized				Signalized/pedestrian priority/uncontrolled crossing, possibly with central refuge island						
	Slow vehicle route	Not applicable				Segregated track or service roads for high traffic speeds or traffic volume, slow vehicle lanes for lower traffic speeds and volume, mixed traffic for very low traffic speeds or very low traffic volume										
	Motorcycle lane	Possible exclusive motorcycle lanes						Possible non-exclusive motorcycle lanes								
	Traffic calming	Not applicable				Traffic calming schemes, possibly with vertical speed reduction facilities within built-up areas										
Delineation	Delineation	Line marking for all roads, chevron signs/delineators/raised pavement markers subject to conditions														
	Rumble strip	Edge line/transverse rumble strips desirable						Edge line/centreline/transverse rumble strips if deemed appropriate and at curves								
	Road lighting	Road lighting if deemed appropriate within built-up areas/at intersections/with frequent pedestrians or slow vehicles at night-time, road lighting needed for toll plazas/tunnels/special bridges/border control points etc.														

Topics	Highway classification	Primary[1]				Class I			Class II				Class III			
	Design speed (km/h)	120	100	80	60	100	80	50	80	60	50	40	60	50	40	30
Road infrastructure	Curve	Coordination of neighbouring curve radii				Avoidance of isolated sharp curves			Avoidance of isolated sharp curves; hairpins subject to comprehensive treatments							
	Overtaking section	Possible restriction for unfavourable alignment and tunnel							Systematic overtaking management							
	Long steep grade	Strategic measures				Comprehensive measures				Comprehensive measures depending on circumstances						
	Climbing lane															
	Parking facility															
Roadside safety	Roadside															

The default speed limit through densely populated built-up areas should not exceed 50km/h.



Topics	Highway classification	Primary[1]	Class I	Class II	Class III
Road infrastructure	Parking facility	Service area/rest area/emergency layby	Possible service area for Class I roads, rest area/parking layby/emergency layby/bus facility/filling station		
Roadside safety	Roadside	Clear zone or safety barrier with transition and end treatment			Clear zone or safety barrier with transition, end treatment particularly
	Median	Wide median or median safety barrier	Median with segregation and/or safety barrier	Wide centreline	Centreline
	Intersections	Clear zone or crash cushion at diverge gores			
Intersections	Priority intersection	Not applicable	Protected offside turn lane subject to condi		
	Side road Channelization island		Side roa		
	Roundabout		Rounda		
	Signalized intersection		Signaliz		
	U-turn facility		Systema facilities		
	Grade-separation	Grade-separation only	Grade-s higher t		
Pedestrians, slow vehicles and traffic calming	Pedestrian footpath	Not applicable	Footpat		
	Pedestrian/slow vehicle crossing	Grade-separated	Grade-s		
	Slow vehicle route	Not applicable	Segrega speeds a		
	Motorcycle lane	Possible exclusive motorcycle lanes			
	Traffic calming	Not applicable	Traffic c		
Delineation	Delineation	Line marking for all roads, chevron signs/d			
	Rumble strip	Edge line/transverse rumble strips desirable			
	Road lighting	Road lighting if deemed appropriate within needed for toll plazas/tunnels/special bridg			

Wide centreline marking: Centreline marking which has an overall width larger than normal, and is generally in the order of 0.6m to 1.0m but may be even wider, e.g. 1.5m to 2m.

Topics	Highway classification	Primary[1]				Class I			Class II				Class III			
	Design speed (km/h)	120	100	80	60	100	80	50	80	60	50	40	60	50	40	30
Road infrastructure	Curve	Coordination of neighbouring curve radii				Avoidance of isolated sharp curves			Avoidance of isolated sharp curves; hairpins subject to comprehensive treatments							
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	Long steep grade	Strategic measures				Comprehensive measures						Comprehensive measures depending on circumstances				
Roadside safety																
Intersections																
	Grade-separation	Grade-separation only				higher traffic volume			Generally not applicable							
Pedestrians, slow vehicles and traffic calming	Pedestrian footpath	Not applicable				Footpath where pedestrians are present, segregated footpaths for high traffic speeds or traffic volume										
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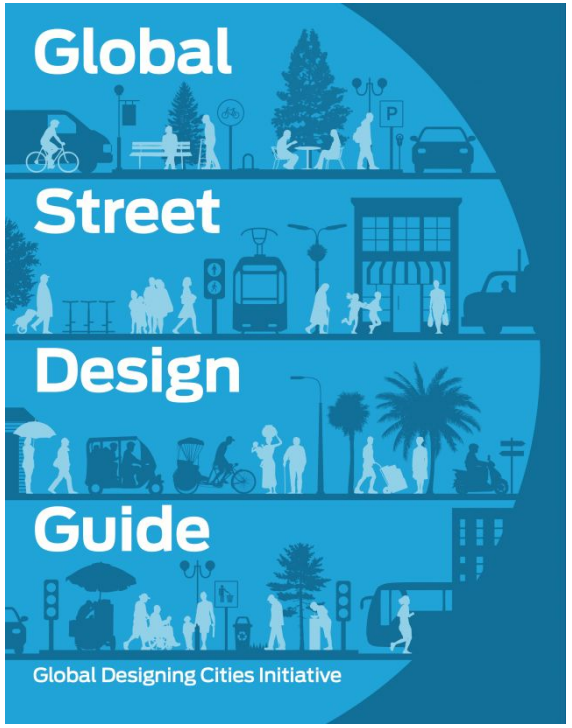
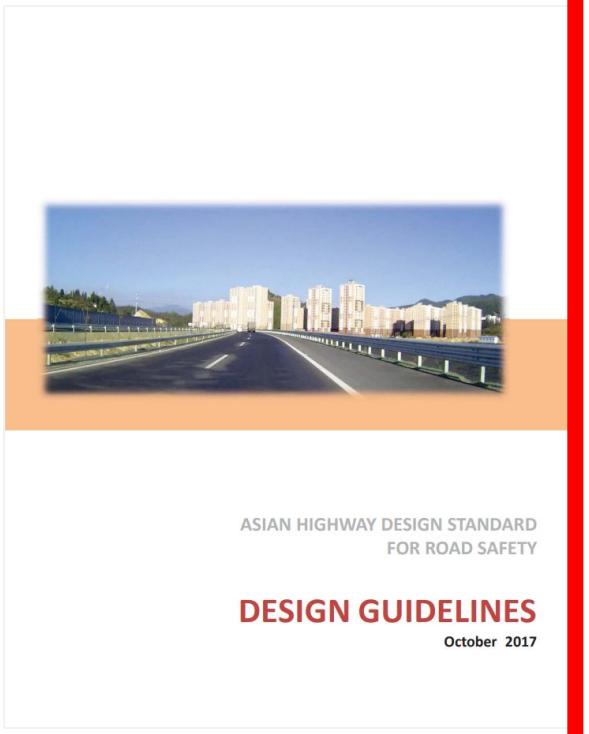
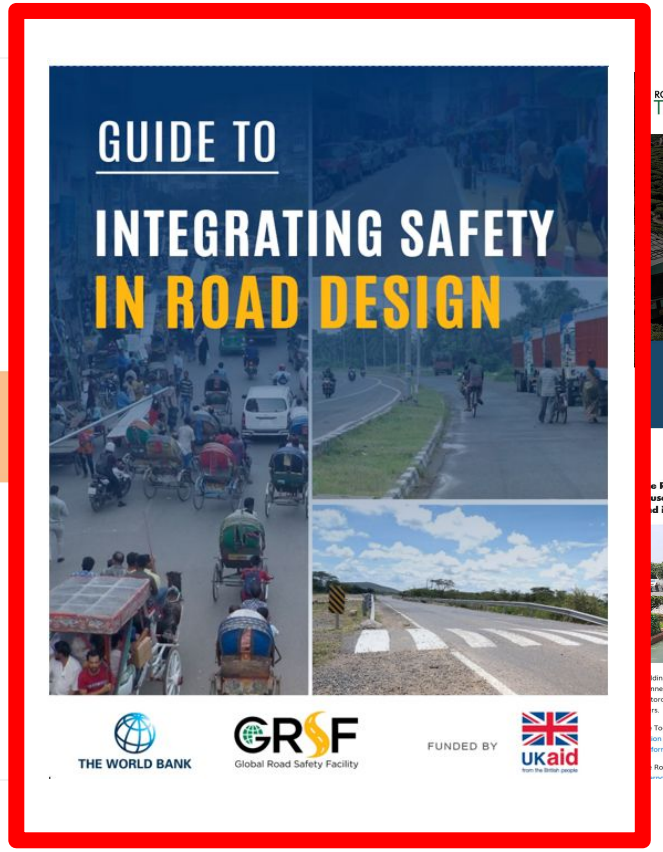
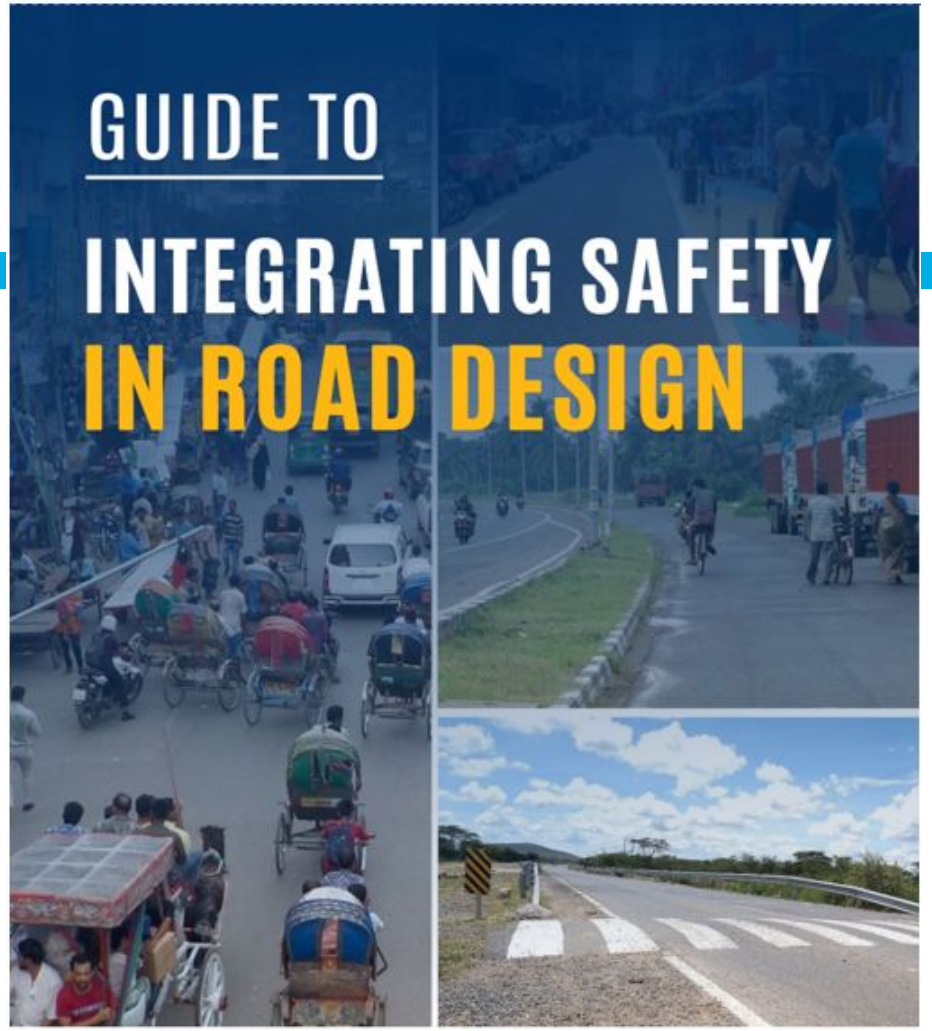






GRSF Guide

- New guide produced by the Global Road Safety Facility at the World Bank
- Detailed information on safety-related issues that need attention through road design process
- Not a design guide!
- Planned for release in the coming months
- Online access
- Clear guidance relating to safety, lots of photos, examples and case studies
- Brings safety of road users to the forefront of design considerations



https://www.roadsafetyfacility.org/contact-us

GRSF Guide

Detailed sections on:

- Safe Systems principles in Road Design
- Key aspects of design – e.g. design speed, sight distance, access control
- Design for vulnerable road users
- Cross section and alignment
- Intersections
- Design tools for safe outcomes

Content for each design element includes:

- General description
- Safety implications
- Good design practice
- Further reading and case studies

GRSF Guide

Some key differences in this guide compared to the past:

- Special focus on the most vulnerable
- Safe System guiding principles for design
- Low- and Middle- Income Country focus: with case studies, examples and photos
- Information on the importance of other processes and tools to ensure safety
- Limitations of guides / the need to innovate
- The need for road safety metrics in design
- Design within broader infrastructure safety management, including the role of road safety audit

Use to:

- Better embed safety into projects
- Produce country-level guide updates
- Improve overall road safety infrastructure management

5.8. Barriers

General description

Barriers are used to shield hazards from errant vehicles. They can be used along the median (sometimes referred to as non-traversable medians) to prohibit movement of traffic across the median or on the roadsides to shield roadside hazards. They are designed to redirect an impacting vehicle and dissipate crash forces in a controlled manner, thus reducing the severity of crashes involving out-of-control vehicles.

Barriers broadly fall under three categories: flexible barriers (e.g., wire-rope safety barriers), semi-rigid barriers (e.g., steel beam), and rigid barriers (e.g., concrete). Each type of barrier has various benefits and constraints that make them suitable for some locations, but unsuitable for others. To avoid installing unsafe barriers or wasting resources, engineers need to understand the benefits and the limitations of each barrier type. A brief description of each barrier type is provided below.

Flexible barriers (wire-rope safety barriers)

Wire-rope safety barriers (WRSBs) consist of several tensioned wire ropes (generally three or four) that are held in place by anchorages at each end and supported at the necessary height by frangible steel posts. Upon impact by an errant vehicle, the tensioned cables deflect and absorb the energy of the vehicle, causing the vehicle to slow down. The tensioned cables are designed to guide the impacting vehicle along the barrier while the posts progressively collapse when struck. Eventually, the errant vehicle is redirected back in the direction of travel or slowed down to a stop.

Semi-rigid barriers

These are usually made from steel beams or rails mounted on galvanized steel channel posts. Other types of posts such as timber or concrete may be used where crash tests prove that they perform satisfactorily. These barriers deflect less than flexible barriers and, depending on the impact, they may be able to redirect secondary impacts (i.e., another impact at the same location).

Rigid barriers

These are usually reinforced concrete walls constructed to a profile and height that is suitable to contain and redirect errant vehicles. They offer no or little deflection on impact; therefore, high impact forces may result in severe injuries to vehicle occupants as the vehicle entirely absorbs the impact energy. The most common types of rigid barriers include the F-profile barrier, the New Jersey barrier, the constant slope barrier and the vertical wall barrier.

Figure 5.80: Flexible (wire-rope) barrier.

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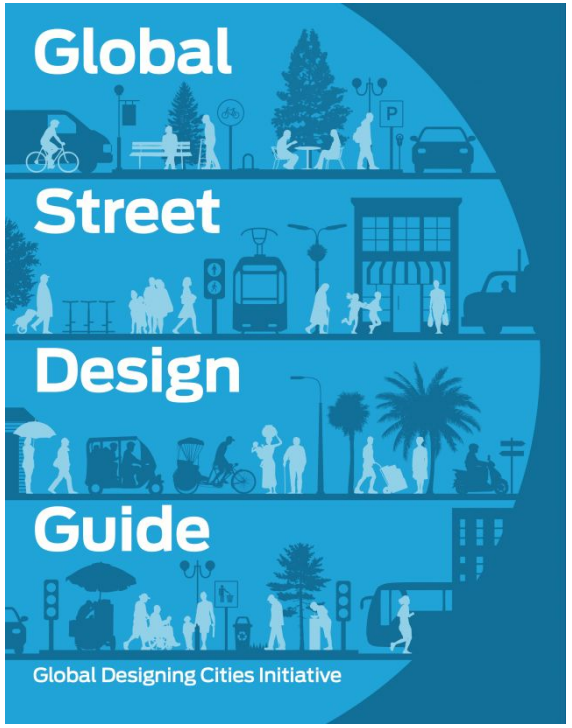

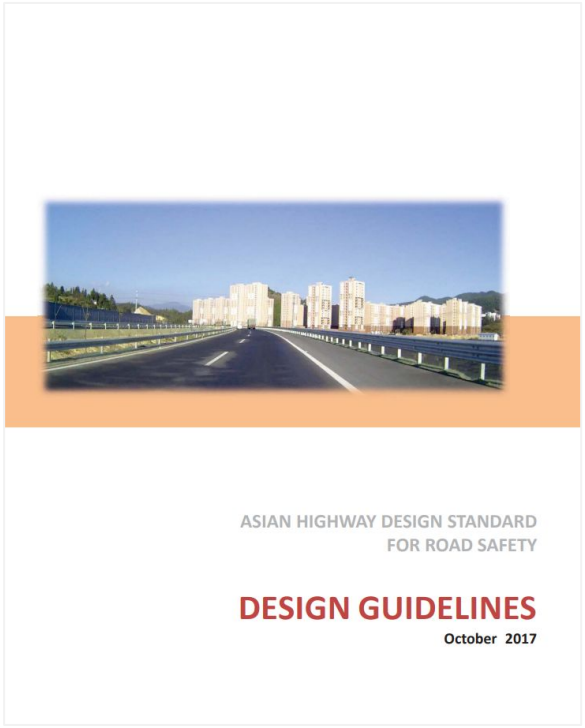

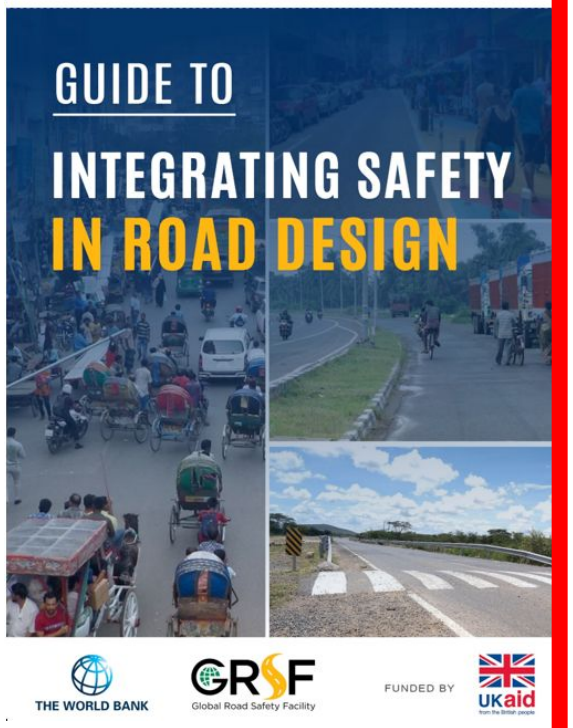

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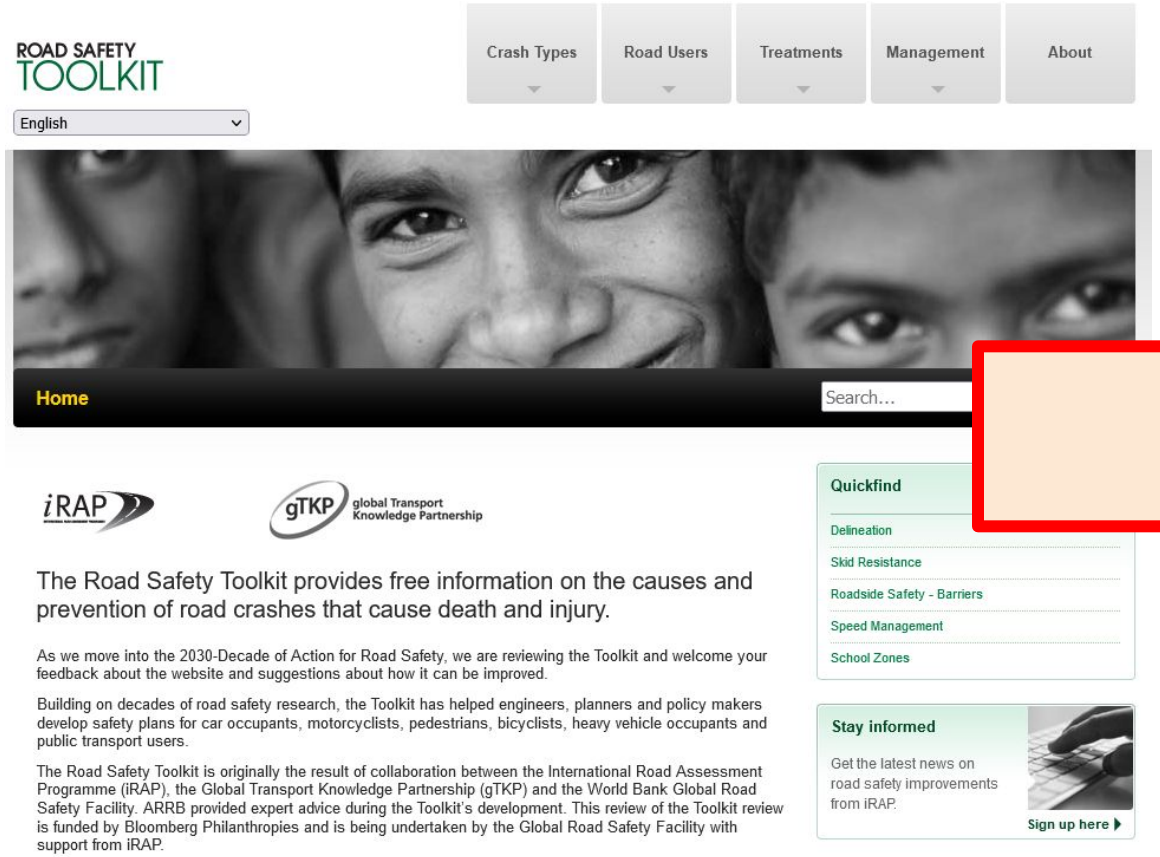
www.toolkit.irap.org



Median

Medians physically separate opposing traffic streams and help stop vehicles travelling into opposing traffic lanes.

They are often built on the centre of wide urban multi-lane and high-speed roads and can be used to limit turning options for vehicles and shift these movements to safer locations, create space for protected turn lanes at intersections, and provide a refuge for pedestrians and bicyclists. Medians can also be accompanied by pedestrian fencing or safety barriers.

Median safety barriers can be made of a range of materials including concrete, steel, and wire rope. Decisions about what type of median barrier should be used should be based on several factors including traffic volume, traffic speed, vehicle mix, median width, the number of lanes, road alignment, crash history, and installation and maintenance costs.

Benefits

- Reduced head-on crashes.
- Can help to prevent dangerous overtaking manoeuvres.
- Can shift turning movements to safer locations.
- Can create space of protected turn lanes at intersections.
- Can create a refuge for pedestrians and bicyclists.

Implementation issues

The Star Rating Demonstrator is a freely available tool with the iRAP online software, ViDA. With the Star Rating Demonstrator, it is possible to explore the impact that this Safer Roads Treatment has on risk.

United Nations Global Road Safety Targets

TARGET 3 2030

TARGET 4 2030

Treatment Summary

Costs	**Medium to high**
Treatment life	**10 years - 20 years**
Effectiveness	**60% or more**

Case Studies

Related case studies

- A-4 Highway
- Bruce Highway (Cooroy to Curra) Upgrade
- Collection of reports on the investigation of severe road crashes in the web site of France's Bureau of Investigation for Accidents of Surface Transports
- Corridor C-12 Road
- Corridor C-55 / C-58

Hundreds of photos

30kmh speed limit at a school i~.png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39395177300_c1ef4b3d4a_o.jpg


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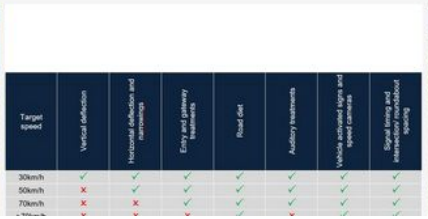
A fixed speed camer~.jpg


A raised pedestrian crossing.jpg


A raised pedestrian crossing w~.jpg

Advisory speed sign plus c~.jpg



>100 Case Studies

Case Studies

See practical examples from around the world of how deaths and serious injuries have been prevented.

Case studies listed in alphabetical order based on case study name. Click on the category heading below to view the related case studies.

All Case Studies | Safer People Treatments | Safer Road Treatments | Safer Vehicle Treatments | Management

All Case Studies

Name of case study	Project Leads	Description
A Brief Overview on the Road Safety Approach in Singapore	Global Road Safety Facility (GRSF)	The report introduces how the Safe System Approach works, with a focus on road infrastructure and road safety engineering best practices from one of the best performing countries in Southeast Asia and the Pacific, Singapore.
A-375 Road	Regional Government of Andalusia (Spain)	This case study describes the reduction in number of head-on and run-off crashes on A-375 road in Spain after implementation of central line rumble strips.
A-4 Highway	Spanish National Government	This case study describes the improvement in Star Rating after implementation of safety barriers on selected section of A-4 highway in Spain. Star Rating improved from 3-star to 4-star for vehicle occupants and from 1-star to 2-star for motorcyclists.
A404 Amersham	Road Safety Foundation (RSF)	This case study describes the upgrades that were implemented on Britain's most improved road as reported in the British EuroRAP Risk Mapping Results 2014. The upgrades have improved the Star Ratings to 39% 2-star, 28% 3-star and 33% 4-star for this road user group. For pedestrians the upgrades have seen the Star Ratings improve from 17% 2-star, 62% 3-star and 21% 4-star to 56% 3-star and 44% 4-star with the 2-star sections eliminated...
Amend and Zoleka Mandela Cut the Ribbon on Lifesaving Infrastructure in Accra, Ghana	Amend	In March, 2020, Zoleka Mandela joined Amend at Oblogo Schools in Accra, Ghana – where recently two children have been killed and many injured in traffic – to cut the ribbon on lifesaving infrastructure.
America's Best New Bikeways of 2020	People for Bikes	These projects make biking more useful, more beautiful and more welcoming to all riders. With careful planning and smart construction, cities relied on support from residents to expand access to completely connected, comfortable mobility networks, allowing people on bikes or on foot to travel safely throughout their community.

AP

GLOBAL ROAD SAFETY PARTNERSHIP

>100 Reference Documents

Reference Materials

The following list includes materials referenced in development of the Road Safety Toolkit.

Search:

Name	Author	Safer roads	Safer people	Safer vehicles	Management
World Report on Child Injury Prevention	World Health Organization (WHO), UNICEF		✓		
UN Road Safety Resolutions	World Health Organization (WHO)				✓
Decade of Action for Road Safety 2021-2030	World Health Organization (WHO)				✓
Global Status Report on Road Safety 2018	World Health Organization (WHO)				✓
Cyclist safety: an information resource for decision-makers and practitioners	World Health Organization (WHO)	✓	✓		
Road Safety Mass Media Campaigns: A Toolkit	World Health Organization (WHO)		✓		
Post-crash response: supporting those affected by road traffic crashes	World Health Organization (WHO)		✓		
Making roads motorcycle friendly	VicRoads	✓			
BASELINE Project: Road Safety Key Performance Indicators in EU Member States	Vias institute				✓

Actions:

- Does you country/province/city have legislation and standards in place?
- If yes – do they align with the Global Plan and best practice?
- If no – set in place your process for reviews and updates?
- Consider:
  - Who is responsible for legislation and standards?
  - What would be needed to formally ratify the Safety Standard for the Asian Highway Network?
  - Can you adapt best practice guides for local context (eg translate)
  - Do you need specific training and technical support?

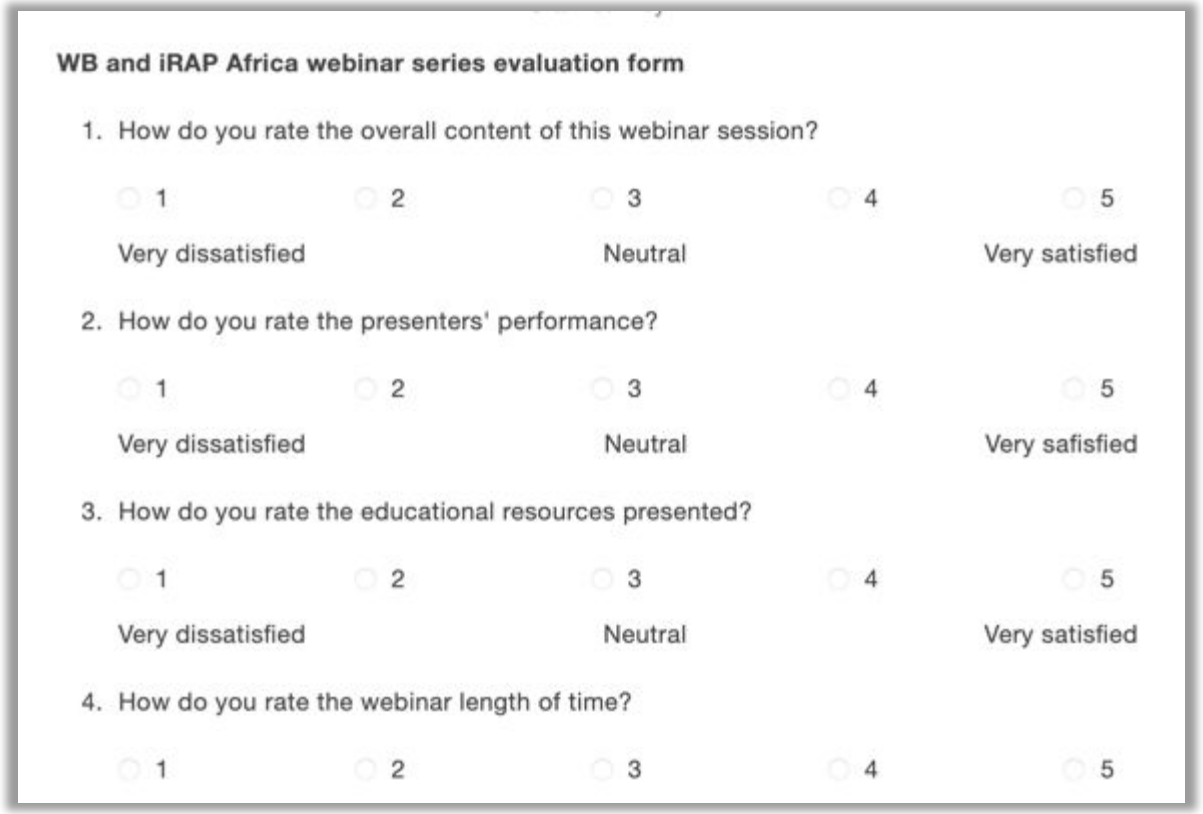
Questions?

In conclusion

- (summary of the day)
- (summary of the day)

Your feedback is important for us!

Please stay on the line…



WB and iRAP Africa webinar series evaluation form

1. How do you rate the overall content of this webinar session?

1	2	3	4	5
Very dissatisfied		Neutral		Very satisfied

2. How do you rate the presenters' performance?

1	2	3	4	5
Very dissatisfied		Neutral		Very safisfied

3. How do you rate the educational resources presented?

1	2	3	4	5
Very dissatisfied		Neutral		Very satisfied

4. How do you rate the webinar length of time?

1	2	3	4	5

ANNOUNCEMENTS / UPCOMMING EVENTS

Asia and The Pacific Transport Forum

- Main Forum on 5–7 April
- Pre Forum Events on 29 March–1 April

PRE FORUM EVENTS *times are Manila time (+8GMT)

TUESDAY 29 MARCH	WEDNESDAY 30 MARCH	THURSDAY 31 MARCH	FRIDAY 1 APRIL
Asian Transport Outlook In-Depth Webinar 2 p.m. - 4 p.m.	Asia-Pacific Road Safety Observatory Special Webinar 2 p.m. - 4 p.m.	MobiliseYourCity Sustainable Urban Mobility Planning, Special Webinar 2 p.m. - 5 p.m.	E-mobility Special Webinar 2 p.m. - 4 p.m.
Road Asset Management and Decarbonization Toolkit, Special Webinar 2 p.m. - 4 p.m.			Rail Asset Management Webinar 2 p.m. - 5 p.m.

MAIN FORUM EVENTS *times are Manila time (+8GMT)

TIME	TUESDAY 5 APRIL	WEDNESDAY 6 APRIL	THURSDAY 7 APRIL
10:00 a.m. - 11:30 a.m.		Event 1 - Data and Digital Transformation in Transport	Event 2 - Knowledge Solutions for Tomorrow
2:00 p.m. - 3:30 p.m.	Opening Session - Accelerating Transformative and Decarbonized Transport	Session 3 - Pathways to Accessible, Safe, and Inclusive Transport	Session 5 - Quality Transport Infrastructure Investments
4:00 p.m. - 5:30 p.m.	Session 2 - Towards Net Zero Mobility	Session 4 - Accelerating Innovations in Transport	Closing Session - Sustainable Transport by 2030

ANNOUNCEMENTS / UPCOMMING EVENTS

UN High Level Meeting on Road Safety

- New York
- 30 June & 1 July, 2022

Transforming Transportation

- February 16 & 17, 2022
- Online
- https://www.transformingtransportation.org/

ROAD SAFETY CAPACITY BUILDING PROGRAMME FOR THE ASIA-PACIFIC:

HELPING SAVE LIVES FROM ROAD CRASHES IN ASIA-PACIFIC - WEBINAR SERIES ON SAFER ROAD INFRASTRUCTURE IN THE ASIA-PACIFIC

ORGANIZED BY

THANK YOU FOR JOINING.