

The iRAP Global KPIs for Infrastructure Safety and the AiRAP approaches for the future

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www.irap.org

Why is infrastructure data important?

Strong evidence linking road design with crash likelihood and crash severity.

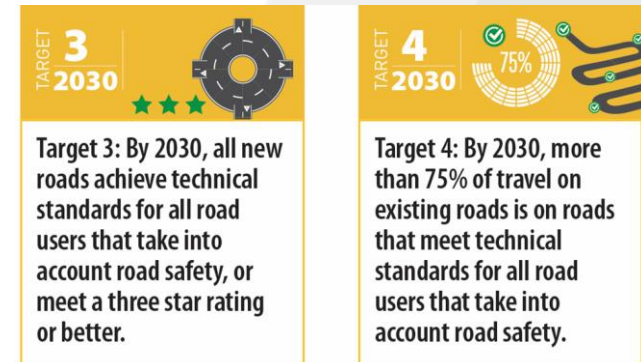
Can be reliably measured.

By systematically inspecting roads, we can develop an understanding of the level of risk that is 'built in' to road networks.

“Proactive” and actionable data that can be to target high-risk sections of road for improvement before people are killed or seriously injured.

Can be used to identify opportunities to encourage more safe, active transport – cycling and walking.

Global Performance Targets

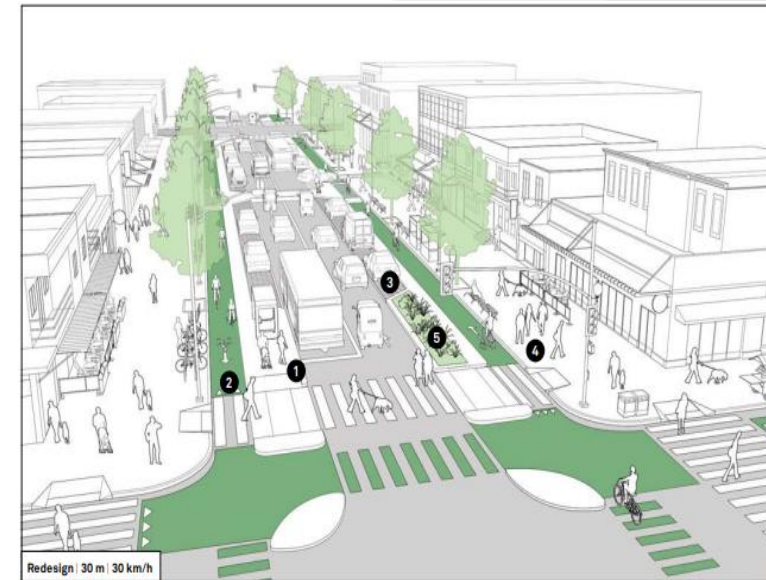
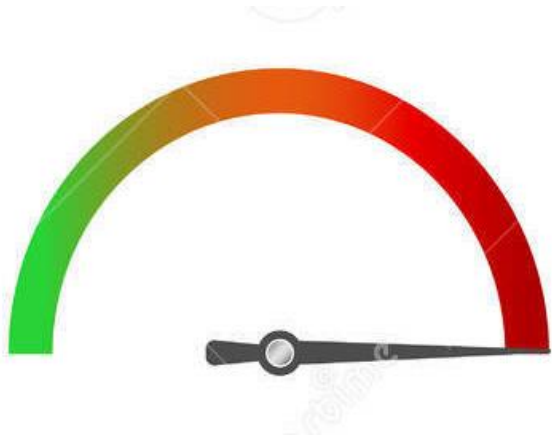


What is infrastructure data?

SPEED

FLOWS

ATTRIBUTES



SAFETY PERFORMANCE INDICATORS

What road attributes?

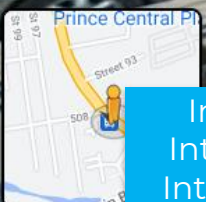
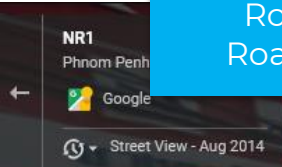
Paved shoulder
Sidewalk provision
Roadside object
Roadside distance

Area type
Speed limit
Operating speed
Vehicle flow

Motorcycle facility
Bicycle facility
Bicycles flow
Pedestrian flow

Curvature
Quality of curve

Paved shoulder
Side walk provision
Roadside object
Roadside distance



Intersection type
Intersection quality
Intersecting volume
Channelisation
Property access point

Crossing facility
Crossing quality
Speed management
Roadworks

Median
Centreline rumble strips
Sight distance
Delineation
Grade

Lane width
Number of lanes
Road condition
Skid resistance

Street lighting
Shoulder rumble strips
Vehicle parking
Service road
Pedestrian fencing

Coder
Coding date
Survey date

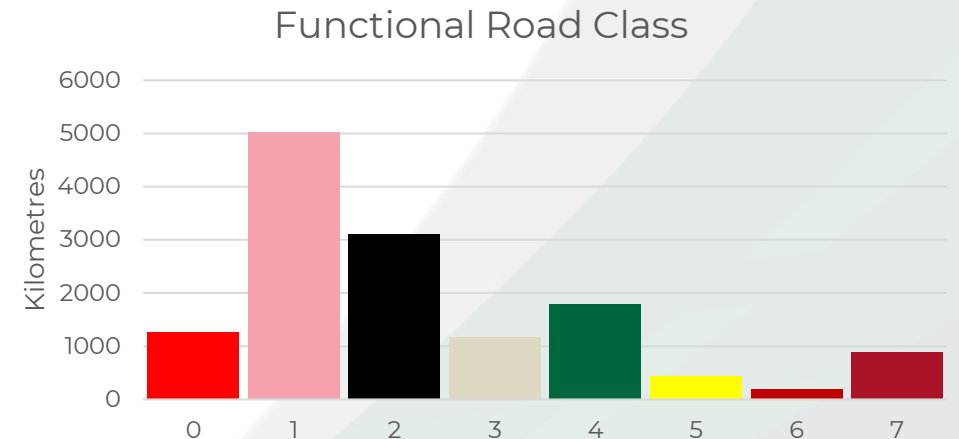
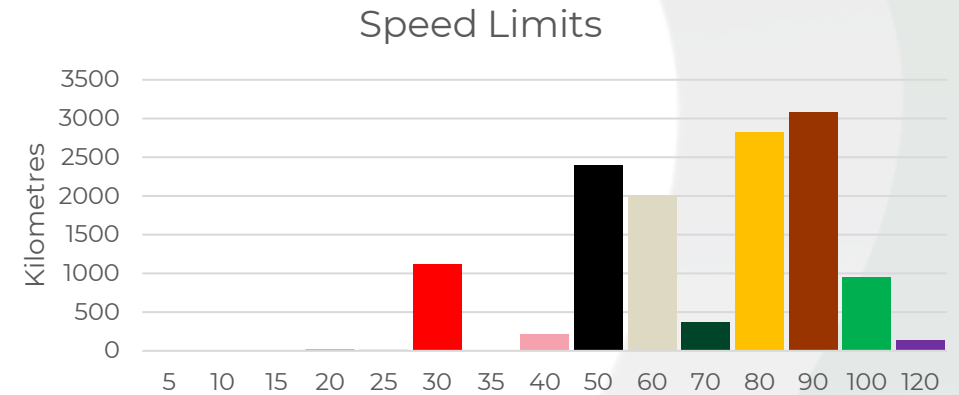
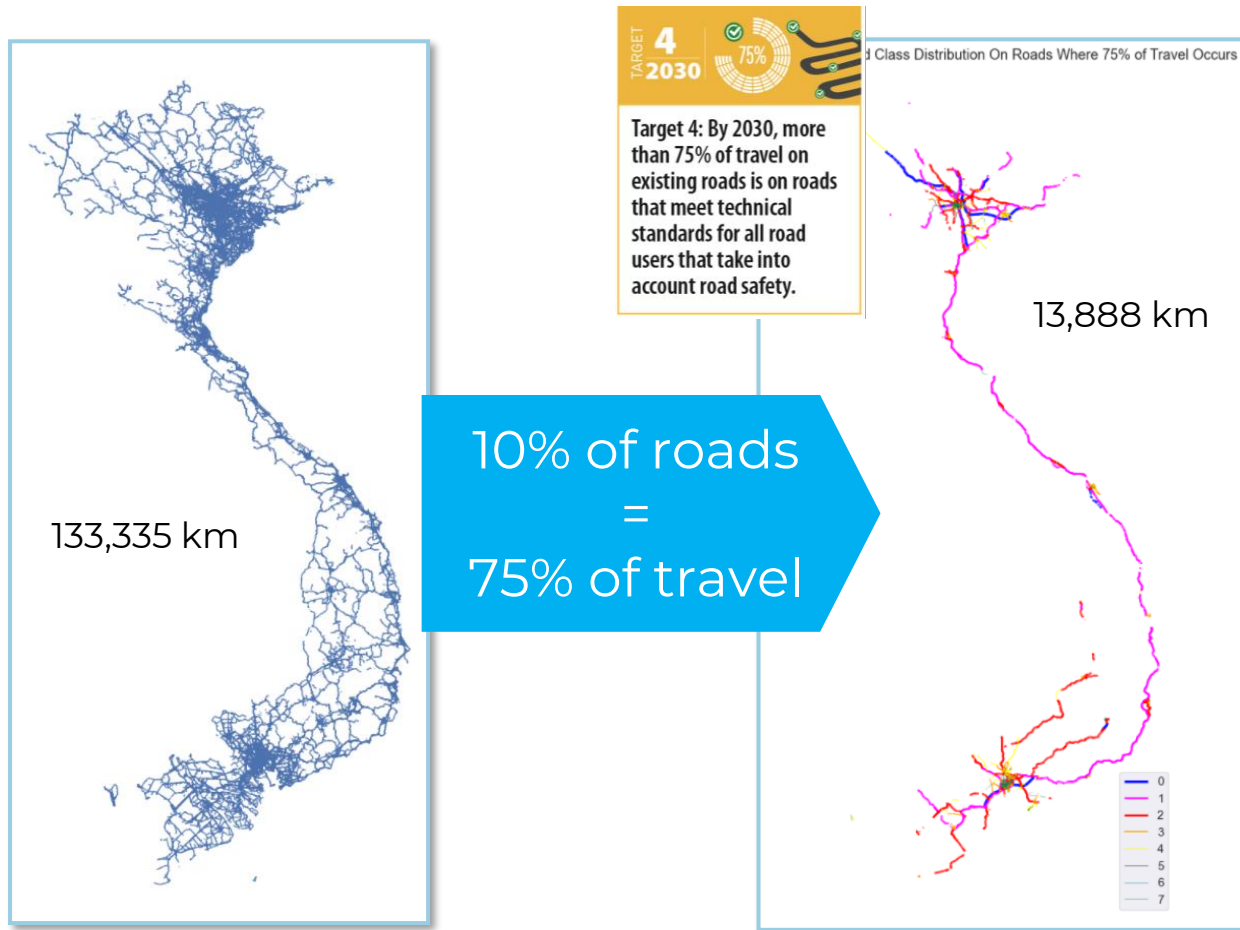
Image reference
Road name
Section

Distance
Length
Latitude

Longitude
Landmark
Comments

Carriageway label

Example: Flows and speed



Where does 75% of travel occur on your network and at what speed?

Example: Helping drivers and riders see the road

HIGHER RISK



LOWER RISK



What % of your network has good line marking?

Example: Treating risk for pedestrians

HIGHER RISK



LOWER RISK



What % of your network has good quality slow-speed crossings?

Example: Treating head-on crash risk

HIGHER RISK



LOWER RISK



What % of your network has a median treatment?

Example: Treating head-on crash risk

HIGHER RISK

LOWER RISK



What % of your network has a median treatment?

Example: Treating risk for bicyclists

HIGHER RISK

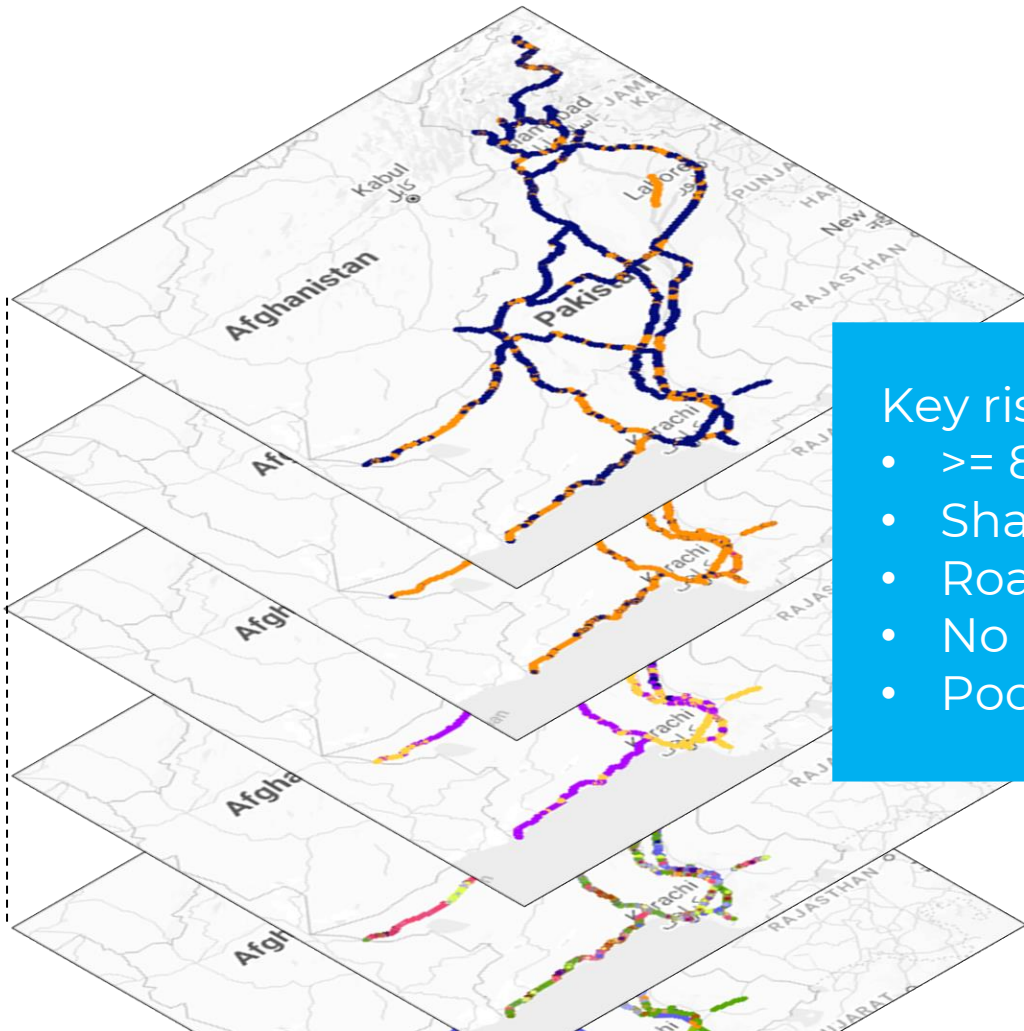


LOWER RISK

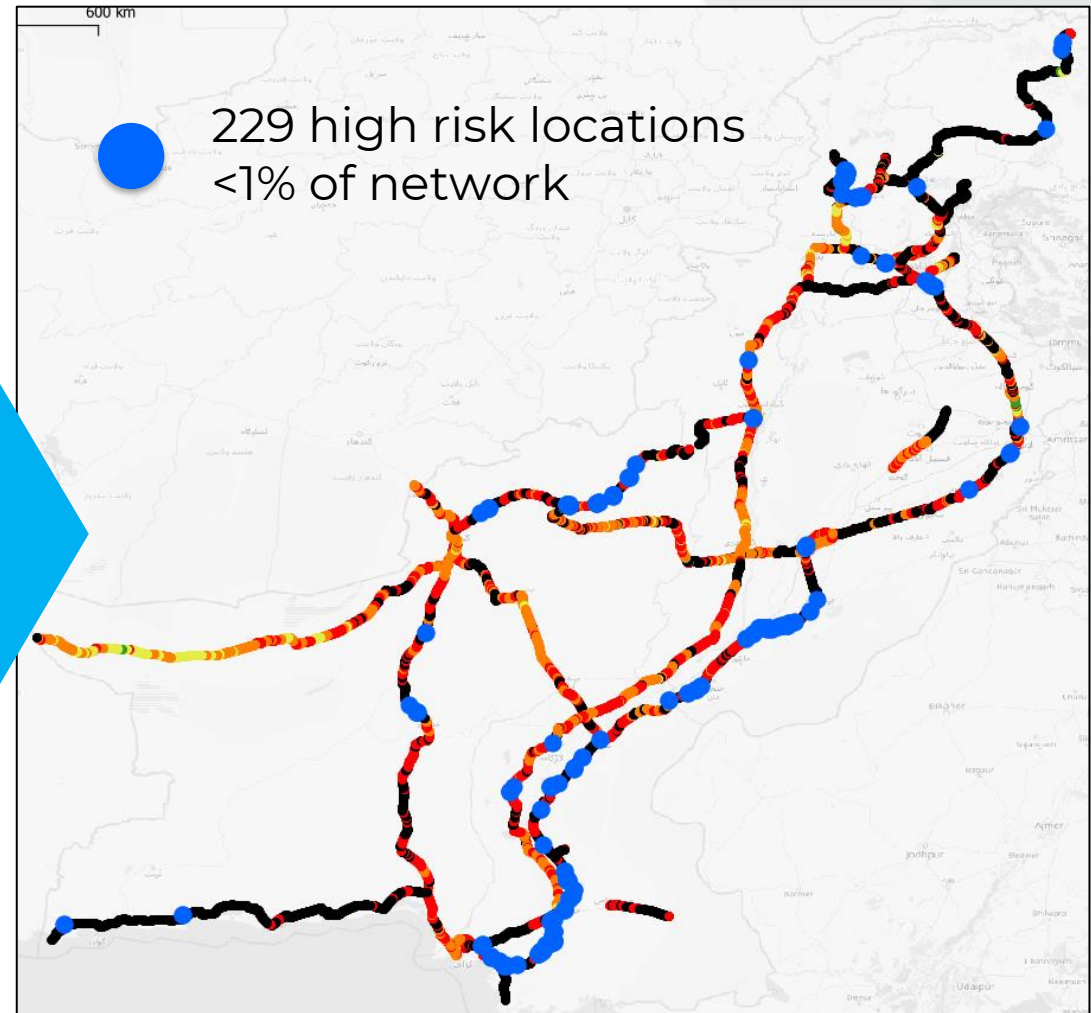


What % of your network has good quality bicycle lanes?

Example: High run-off road risk



- Key risk factors:
- $\geq 80\text{km/h}$
 - Sharp curves
 - Roadside hazard
 - No paved shoulder
 - Poor delineation



Where is there high risk of run-off crashes on your network?

iRAP Key Performance Indicators



% where 40km/h or more have formal footpaths or sidewalks

% where 40km/h or more have pedestrian crossing facilities

% schools 3-star or better for children

% of crossings that are adequately signed or maintained

% where 40km/h or more have dedicated bicycle facilities



% 80km/h or more have low-risk roadsides

% 80km/h or more do not have sharp curves

% 80km/h or more have dedicated overtaking provision

% 80km/h or more have divided carriageways

% of intersections at 60km/h or more have turning provision

% of railways at 60km/h or more have active protection

% where 60km/h or more have dedicated motorcycle facilities



TARGET 3 2030  

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.

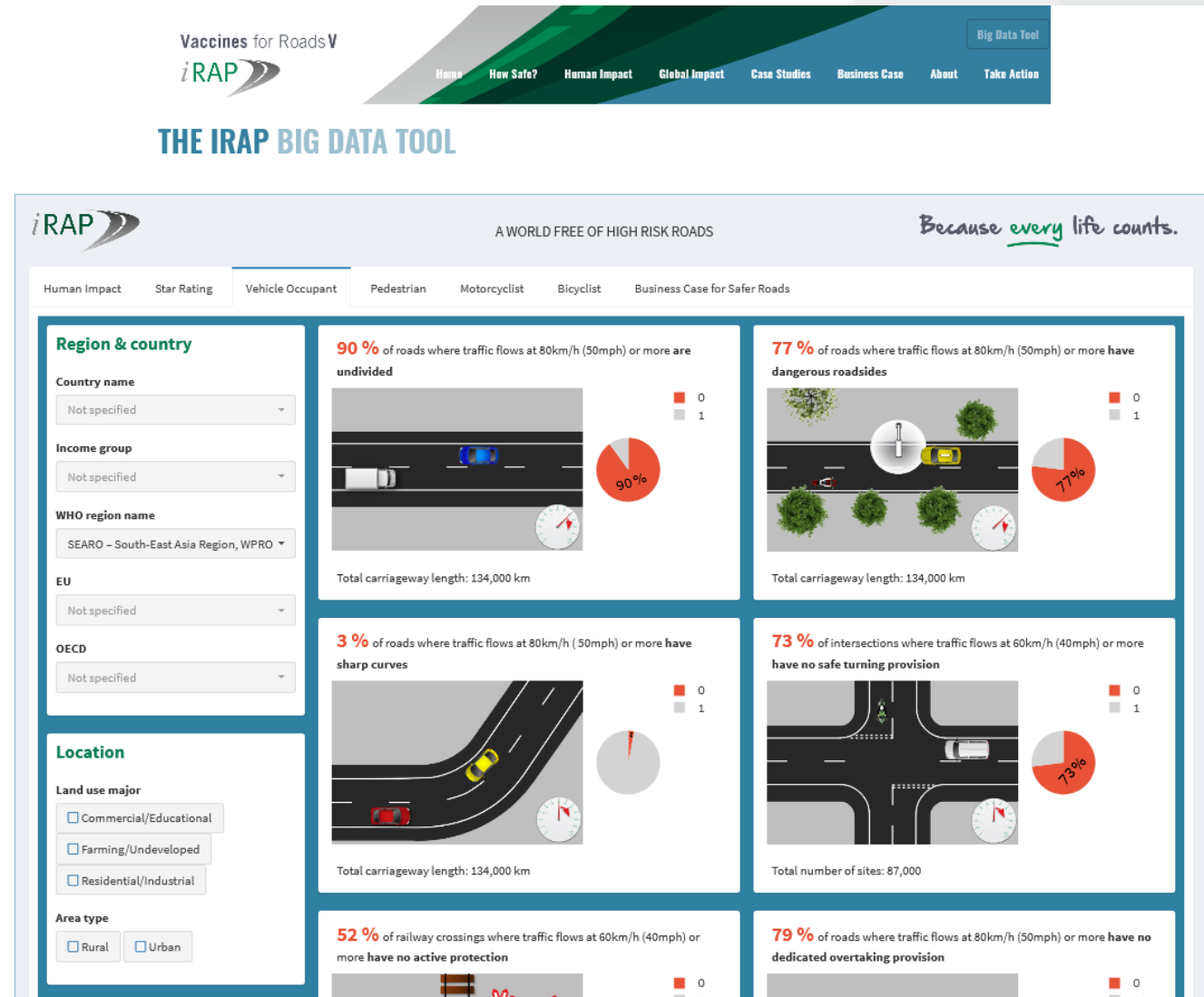
TARGET 4 2030  

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.

Sources of infrastructure data: iRAP

- <https://www.vaccinesforroads.org/how-safe-are-the-worlds-roads/>
- Data for 54 countries and 358,000km
 - Country
 - Income
 - WHO region
 - Land use
 - Area type
 - Carriageway type
 - Flow

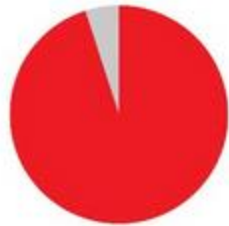
Could be integrated into APRSO



Country income level insights based on a 358,000km sample of roads across 54 countries.

The road attributes that matter:

In low income countries



95%

95% of roads in low income countries do not have formal footpaths or sidewalks where pedestrians travel and speeds are 40km/h or more compared to 50% of roads in high-income countries

In high income countries



50%

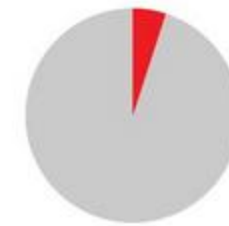
In low income countries



More than 50%

More than 50% of pedestrian crossings in low and middle-income countries are poorly maintained compared to 5% in high-income countries

In high income countries



5%

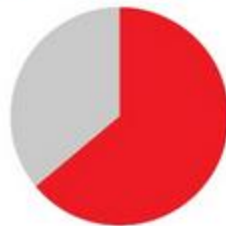
In low income countries



Over 90%

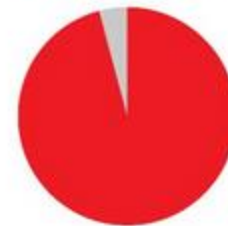
Over 90% of intersections on high speed roads in low- and lower-middle income countries have poor turning provision compared to 64% in high-income countries

In high income countries



64%

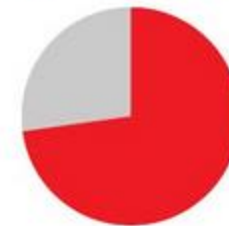
In low income countries



96%

96% of roadsides on high-speed roads are dangerous in low-income countries compared to 73% in high-income countries

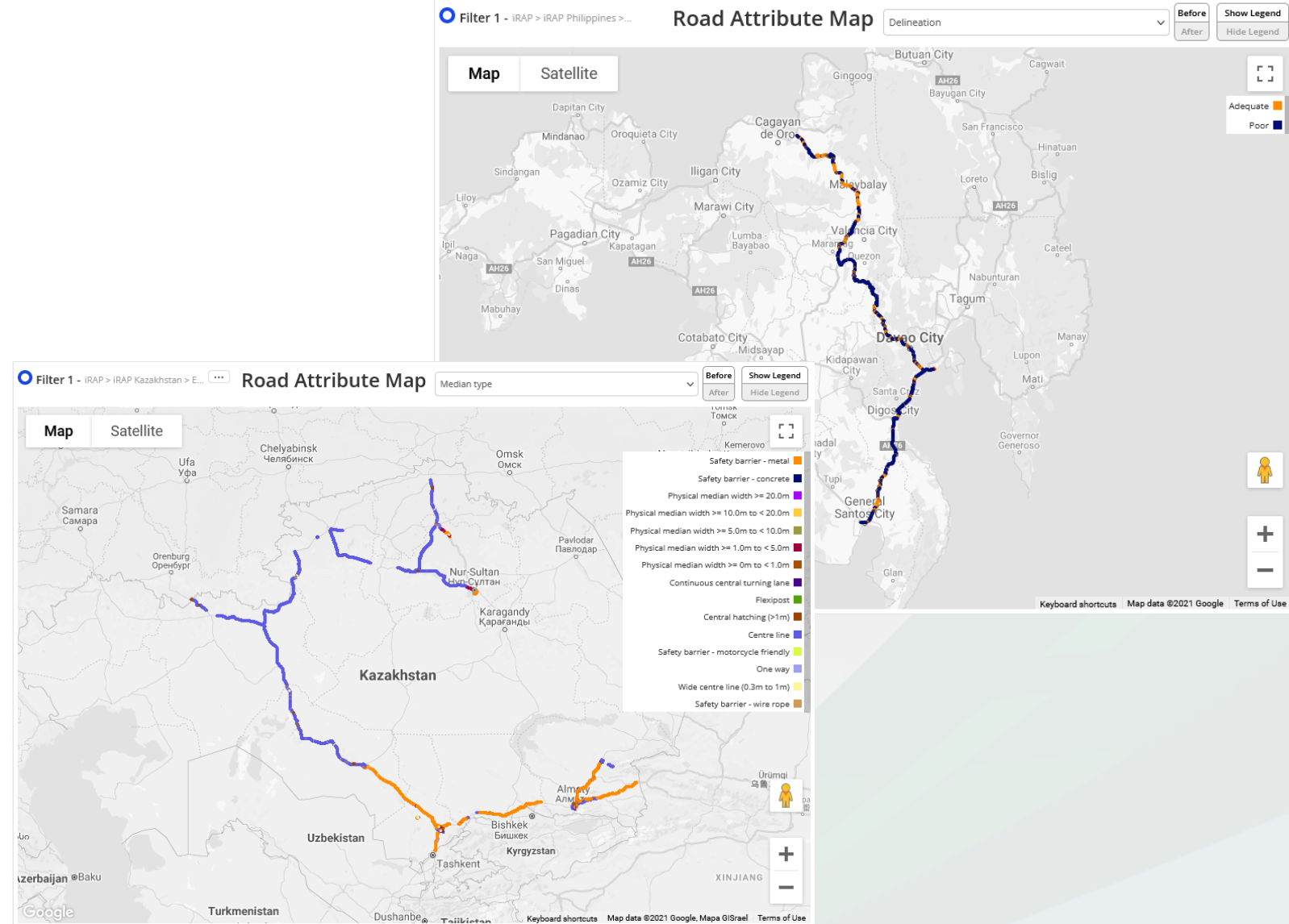
In high income countries



73%

Sources of infrastructure data: iRAP

- <https://vida.irap.org>
- Data for more than 100 countries and 1 million km
- 52 road attributes recorded each 100 metres
- Access may be controlled by country programme manager
- Complete Star Ratings and road attribute datasets



Sources of infrastructure data: aiRAP



<https://irap.org/project/ai-rap/>

DECADE OF ACTION FOR ROAD SAFETY
2021-2030

iRAP
INNOVATION 2021

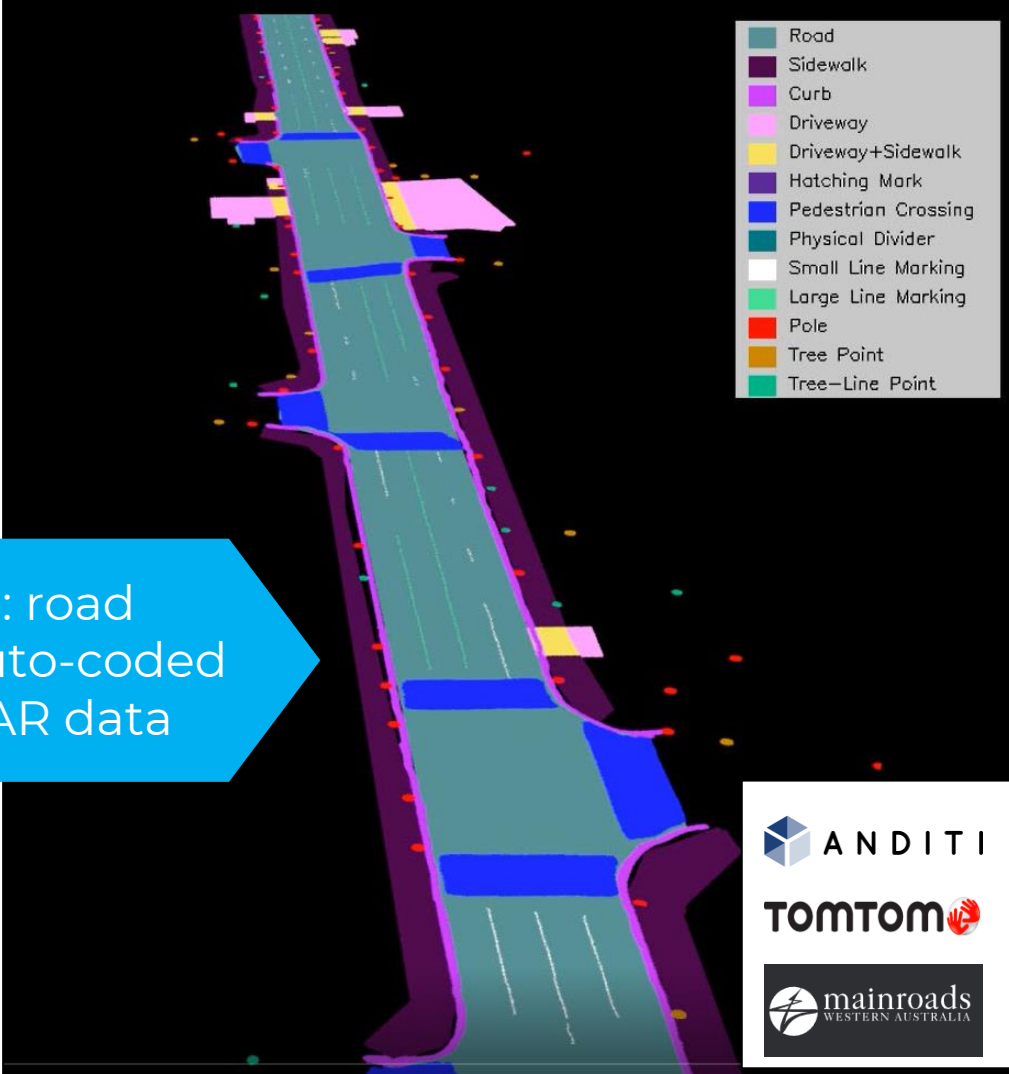
DATA DRIVEN INNOVATION

TO HALVE GLOBAL FATALITIES & INJURIES BY 2030

iRAP ROAD SAFETY OBSERVATORIES OISEVI SSATP ASIA-PACIFIC ROAD SAFETY OBSERVATORY
FIA FOUNDATION THE WORLD BANK GRSF FIA ADB

The poster features a background image of a busy, multi-lane road with heavy traffic, including cars, buses, and motorcycles. The text is overlaid on this image, with the main title 'DATA DRIVEN INNOVATION' in large, bold, green letters. The goal 'TO HALVE GLOBAL FATALITIES & INJURIES BY 2030' is written in smaller black text below the title. At the bottom, there is a row of logos for various partner organizations.

Example: road attributes auto-coded using LIDAR data







Conclusion

- Strong evidence linking road design with crash likelihood and crash severity
- Road attribute data is reliable
- By systematically inspecting roads, we can develop an understanding of the level of risk that is 'built in' to road networks
- Data already exists for networks that carry a large % of travel
- Opportunities to leverage existing data and technology to reduce costs

For more information

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<https://vida.irap.org/>

<https://www.starratingforschools.org/>