
POLIS
CITIES AND REGIONS FOR TRANSPORT INNOVATION
regio arnhem nijmegen
Annual
Conference
2020
VIRTUAL EVENT | 30 NOVEMBER-3 DECEMBER 2020

SPEAKER

Lina Konstantinopoulou

Secretary General, EuroRAP

The road safety potential of big data: Ai-RAP and achieving the UN Road Safety Targets

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#POLIS20

About EuroRAP

- **International Not For profit Association (AISBL) "A Europe free of high-risk roads"**

28 National Programmes

Gate-Keeper of Protocols in Europe
National Programme governance (Authority, National RAP, Private Motorway, Uni)

Training & Accreditation

Authorities and private-sector partners in RAP assessment

Research & Innovation

ITS/CAD Star Rating
CityRAP/CycleRAP/SR4Schools
aiRAP

International Cooperation

Exchanges of best practices
EU RAP metrics feed UN protocols

Advocacy

Involved in EC Platforms (e.g. CCAM, RISM)
Position Papers

Deployment

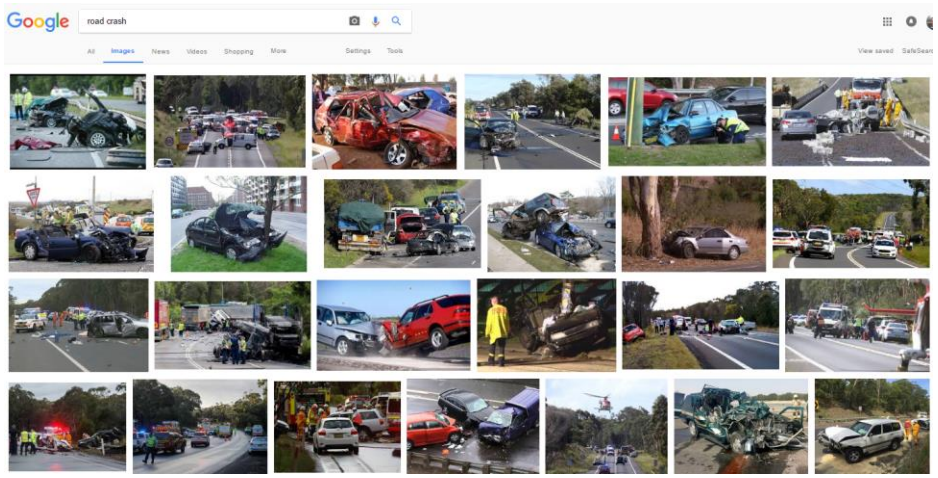
EuroRAP Shared Vision in Europe

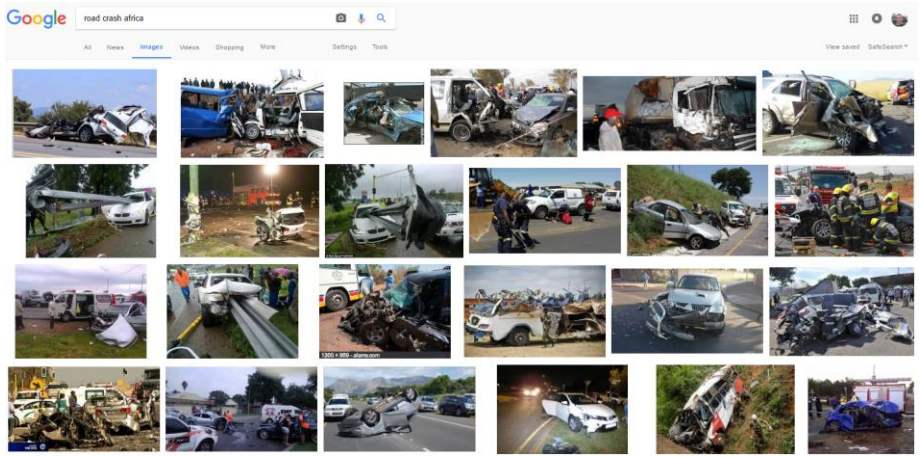
Civil Society Members

Authority Members

Expert Members

The Human Impact of Road Crashes

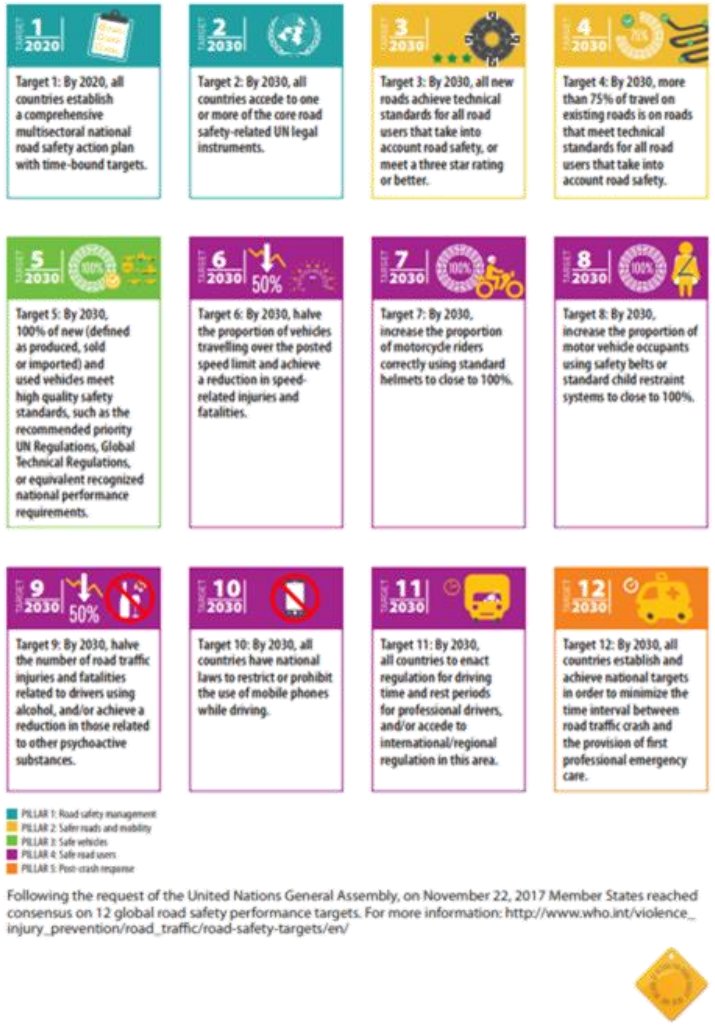




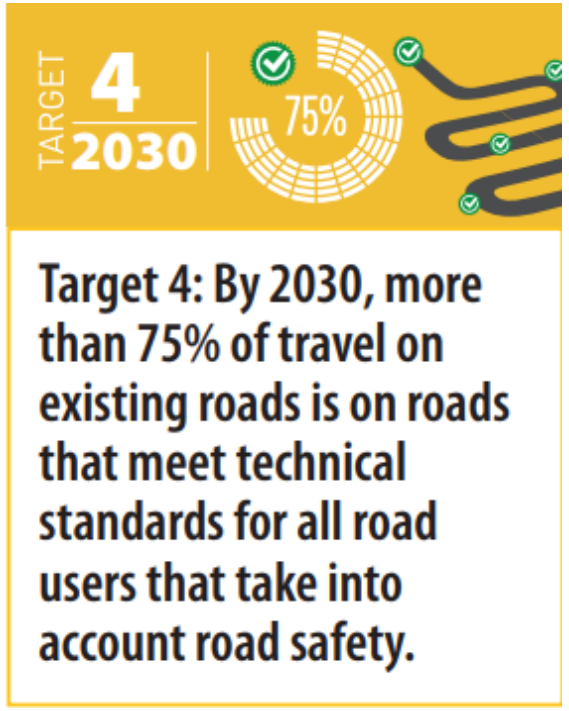
THE HUMAN IMPACT EVERY DAY

NEW VICTIMS EVERY DAY	HUMAN IMPACT	NEW COSTS EVERY DAY (USD)
3,626	Lives Lost	$ 1,731,400,000
932	Severe Acquired Brain Injury	$ 1,271,400,000
20,865	Fractures - Limb	$ 788,500,000
9,090	Internal Injuries	$ 575,400,000
6,672	Brain Injury (Mild) / Head Injury	$ 465,000,000
17,327	Soft Tissue (Neck / Back) / Whiplash	$ 262,900,000
56	Quadriplegia	$ 199,600,000
5,800	Fractures - Other	$ 185,700,000
18,270	Contusion / Abrasion Laceration	$ 109,800,000
2,865	Dislocations	$ 103,200,000
920	Other Spinal	$ 91,600,000
75	Paraplegia	$ 76,400,000
914	Degloving	$ 59,100,000
8,486	Other Injuries	$ 55,400,000
4,266	Sprains / Strains	$ 38,200,000
2,293	Concussion	$ 23,900,000
161	Amputations	$ 15,000,000
176	Burns (Severe / Moderate)	$ 5,800,000
33	Nerve Damage	$ 1,500,000
9	Loss Of Sight / Eyes	$ 300,000
102,835	**TOTAL**	**$ 6+ BILLION**

UN Global Road Safety Performance Targets Supporting RAP Protocols

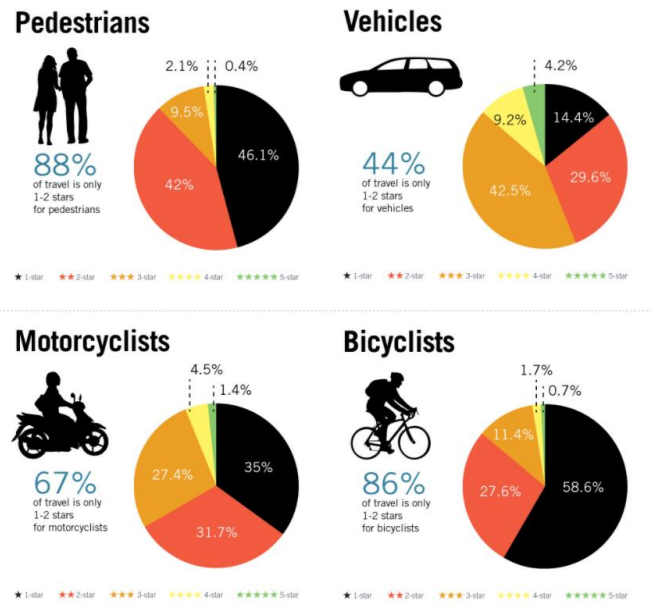


Following the request of the United Nations General Assembly, on November 22, 2017 Member States reached consensus on 12 global road safety performance targets. For more information: http://www.who.int/violence_injury_prevention/road_traffic/road-safety-targets/en/



What is our Challenge?

- Where are crashes happening now and how severe are they?
- How safe are the roads for all road users considering road design, volume and speed?
- What is the performance tracking to drive change and measure success.

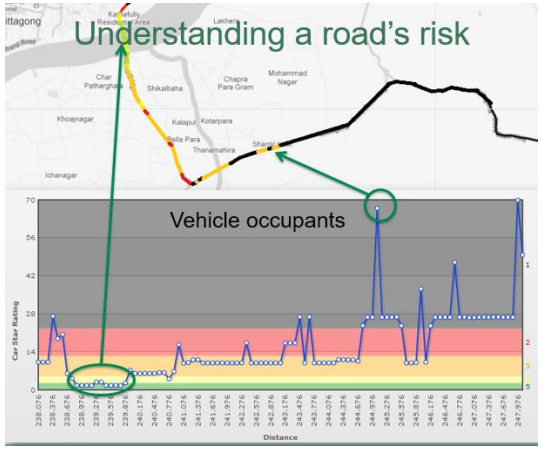


How EuroRAP Can Help

RISK MAPS

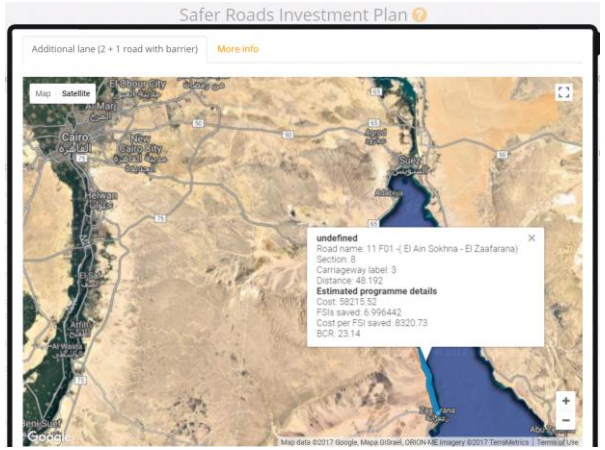
- Colour coded map showing the where people are dying and where their crash risk is greatest
- Can inform priorities across all pillars of road safety action (management, infrastructure, vehicles, road users and post-crash care)

STAR RATING



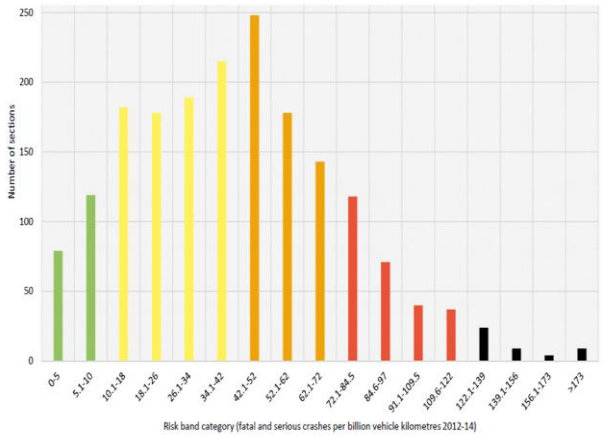
- Based on road inspection data
- Simple and objective measure of the level of safety which is 'built-in' to the road
- Can be completed in the absence of crash data
- Five-star road segments are the safest while one-star are the least safe

INVESTMENT PLANS



- Considers 90 proven road improvement options
- A Safer Roads Investment Plan (SRIP) prioritises and costs improvement options can improve Star Ratings and save lives

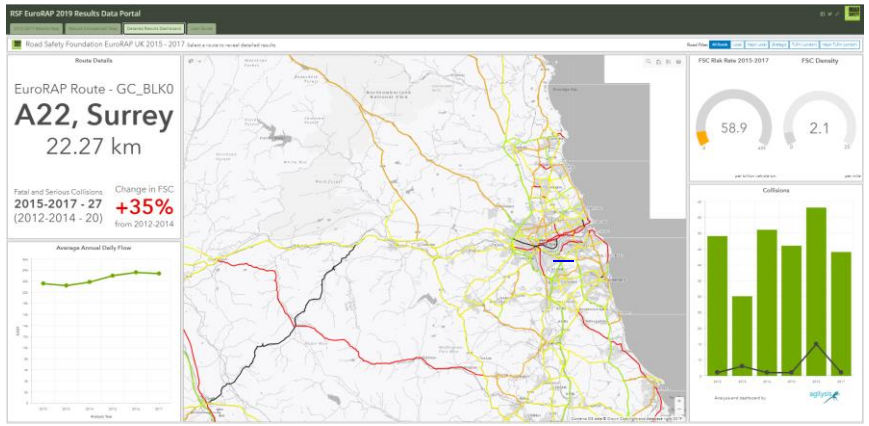
PERFORMANCE



- Regular risk mapping or star rating enables performance monitoring
- Enables celebration of success and action to be taken to address persistently high risk roads

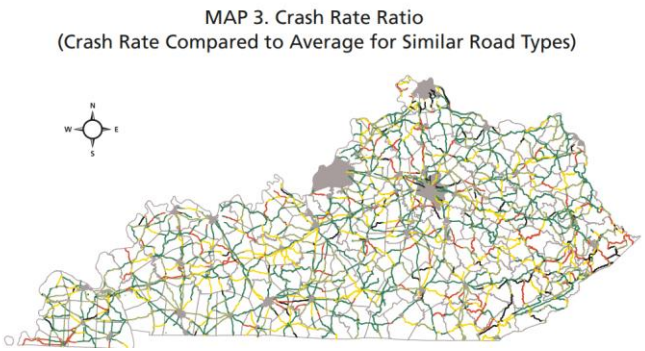
Risk Mapping: harnessing existing crash data

[AusRAP National Highways]



[UK Risk Mapping Results] & [Report]

1,487,017km
of Risk Mapping



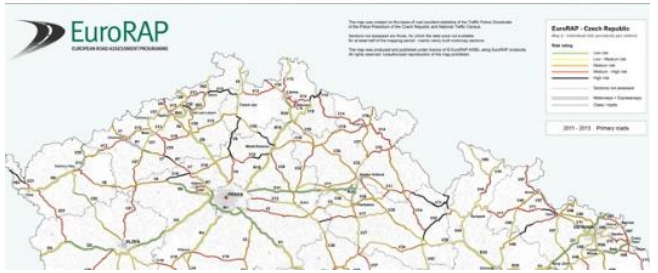
[usRAP Crash Rate Ratio]

Table 1: Most improved road links

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

[NZ Risk Maps and Performance Tracking]

European Road Safety Atlas



[EU Danube Project Radar]

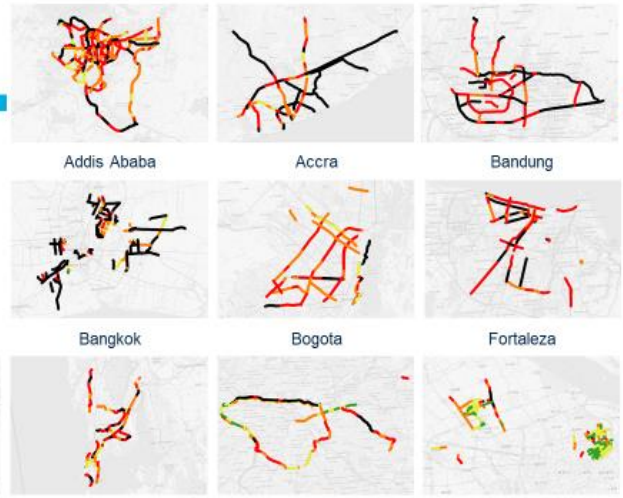
Star Rating: Results https://vida.irap.org/

1,130,930km
of Star Rating

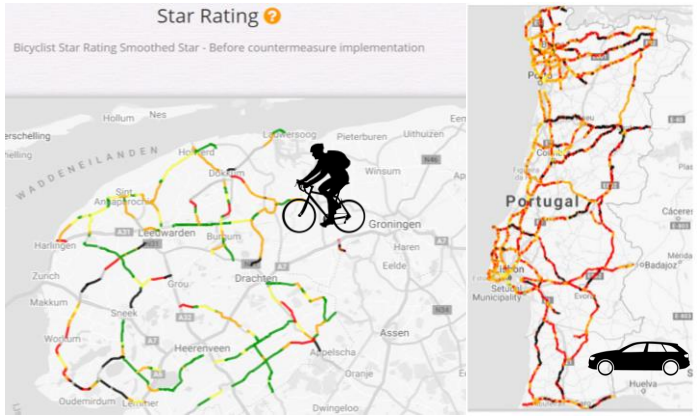
How does my city compare to others?

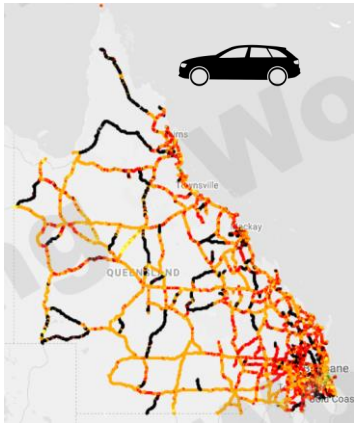
Pedestrian Star Ratings
(before changes were made)

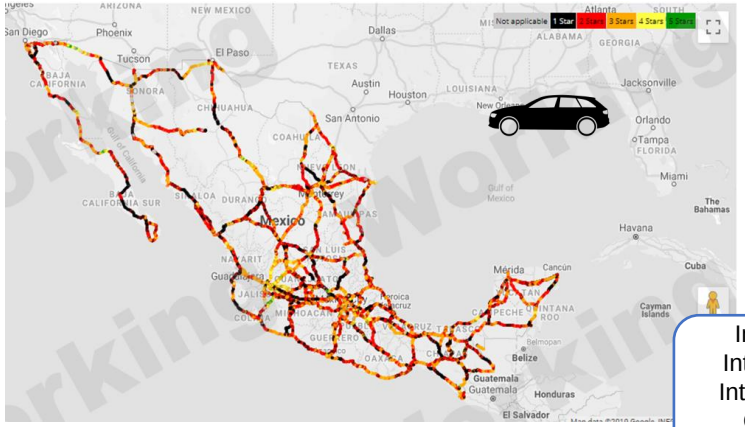
- 1 star
- 2 stars
- 3 stars
- 4 stars
- 5 stars
- N/A



THE WORLD BANK · iRAP · Bloomberg Philanthropies · GRSF







Paved shoulder – left
Side walk provision – left
Roadside object – left
Roadside distance - left

Area type
Speed
Vehicle flow

Motorcycle facility
Bicycle facility
Bicycles flow
Pedestrian flow

Curvature
Quality of curve

Paved shoulder – right
Side walk provision – right
Roadside object – right
Roadside distance - right

Intersection type
Intersection quality
Intersecting volume
Channelisation
Property access point

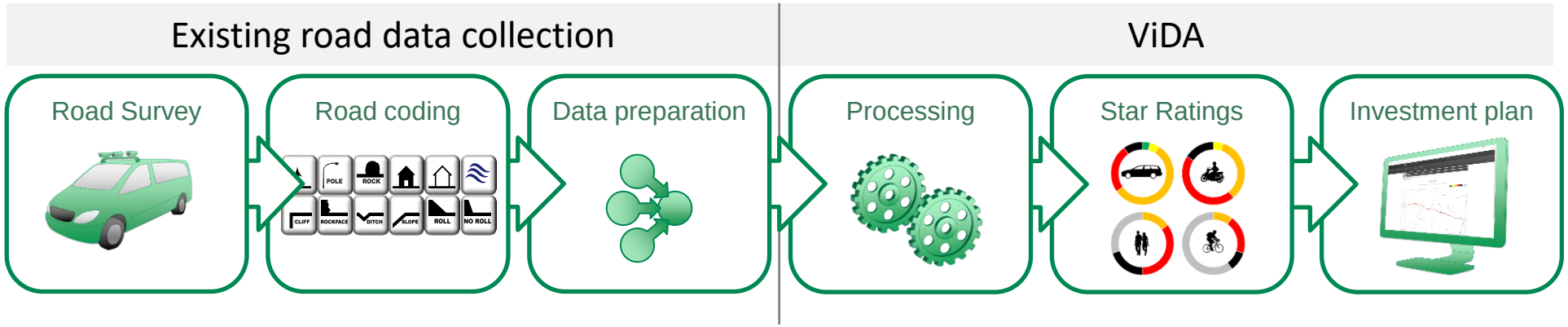
Crossing facility
Crossing quality
Speed management
Roadworks

Median
Centreline rumble strips
Sight distance
Delineation
Grade

Street lighting
Shoulder rumble strips
Vehicle parking
Service road
Pedestrian fencing

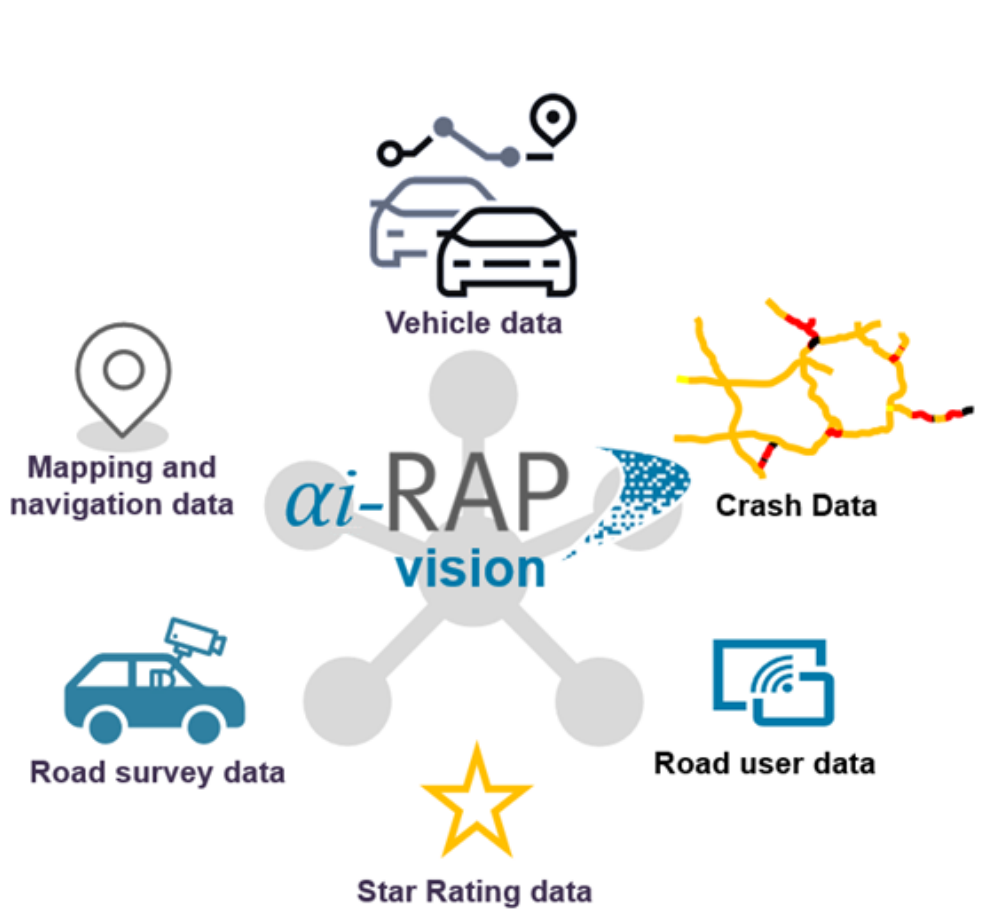
Lane width
Number of lanes
Road condition
Skid resistance

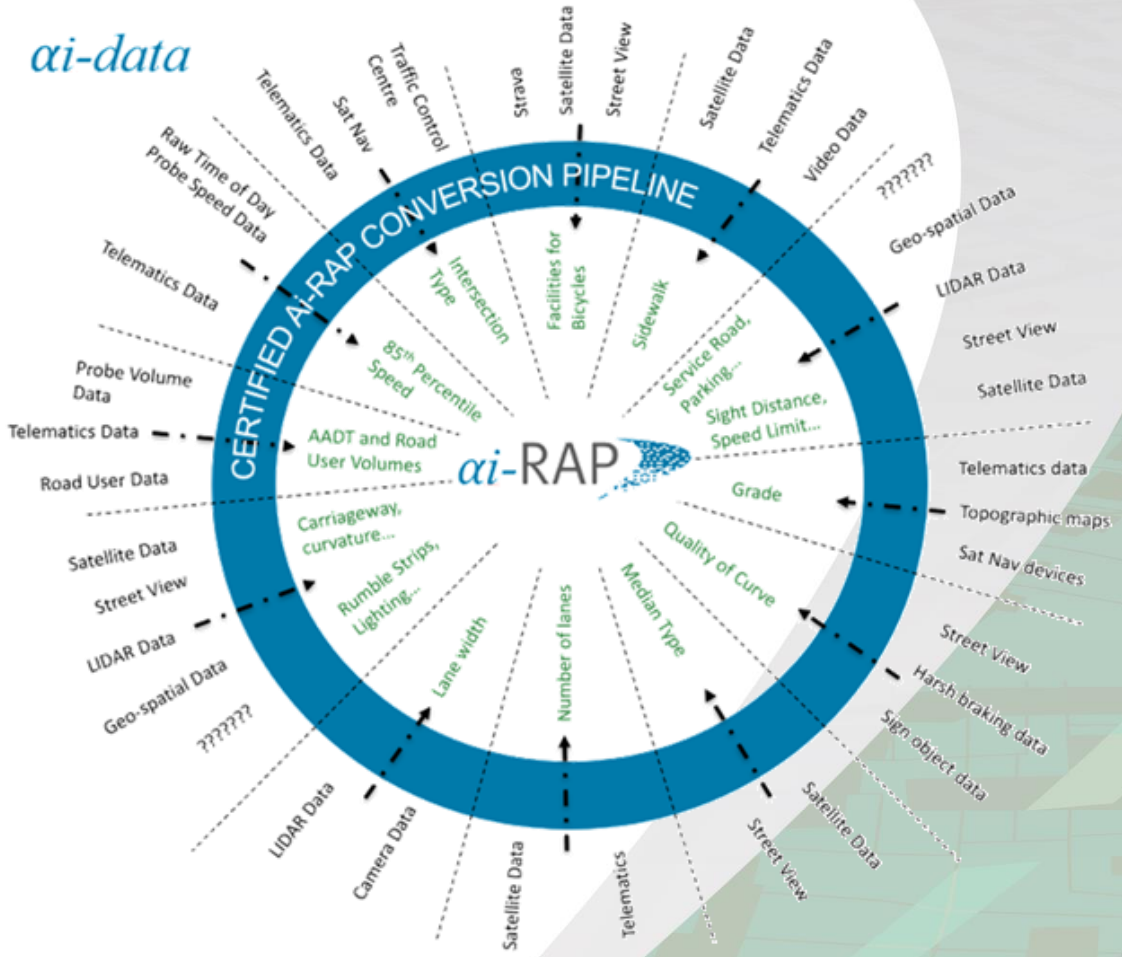
RAP Star Rating Process

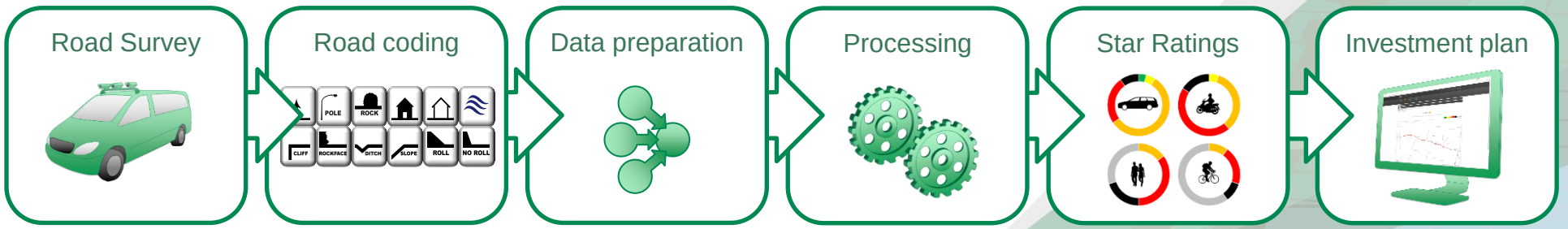


- Assessed every 100 meters
- Model based on crash studies from around the world
- Technical oversight of the model provided by iRAP Global Technical Committee

aiRAP Star Rating Process







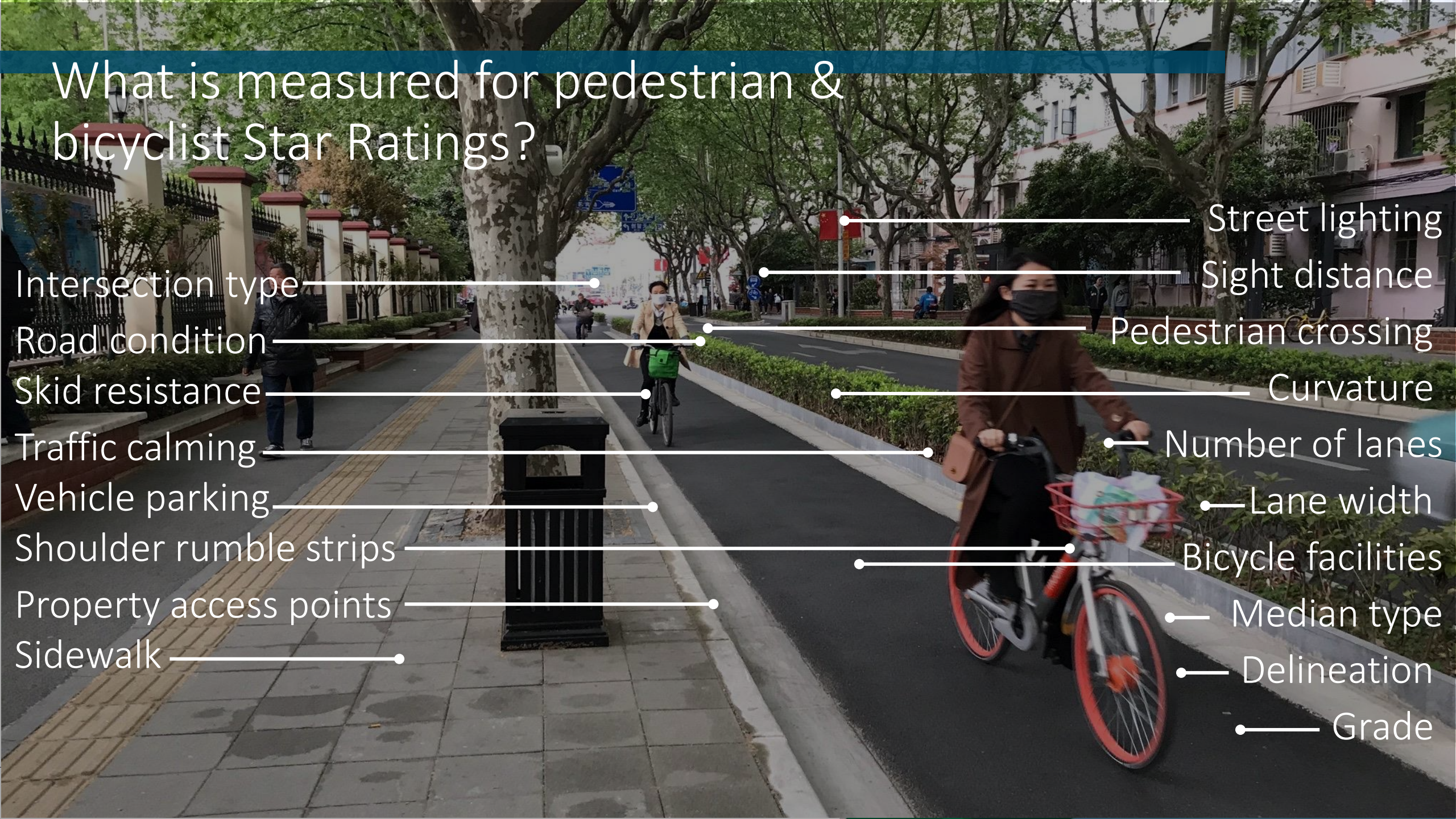
What is a 5-Star city?

Policy and partner approach to promote a focus on safe (5 Star!) streets for pedestrians and bicyclists.

It is a step-up from the global minimum 3-Star targets

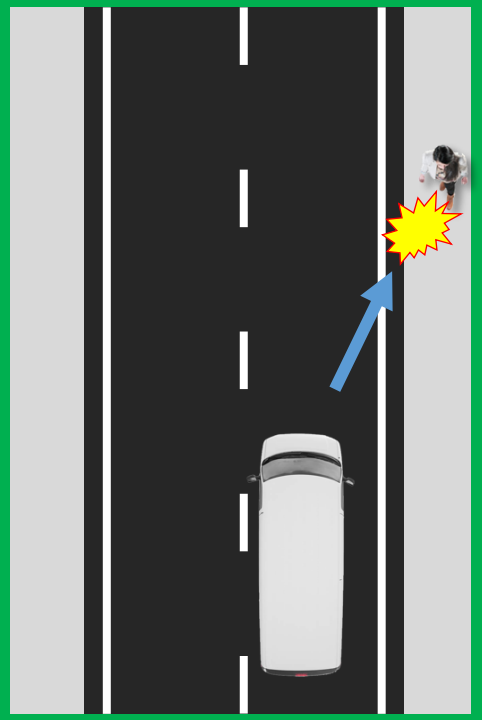
Uses Star Ratings to complement and provide tangible indicators for safety improvements and a way to monitor those improvements.

What is measured for pedestrian & bicyclist Star Ratings?

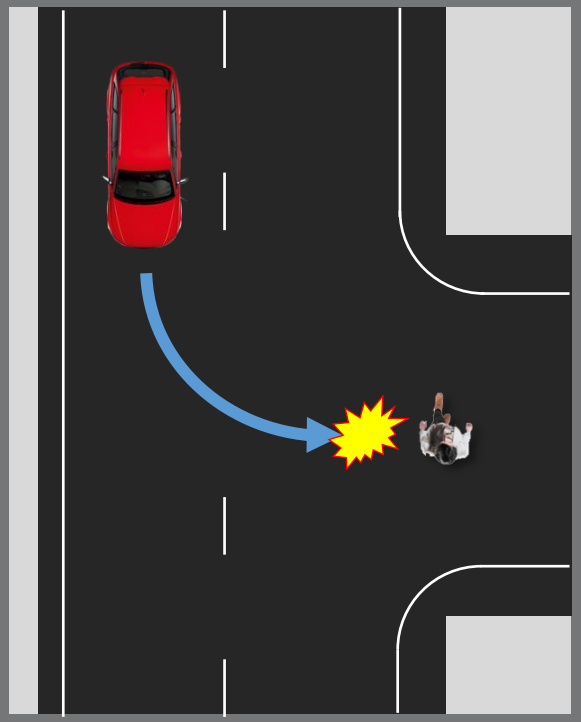


Pedestrian Crash types

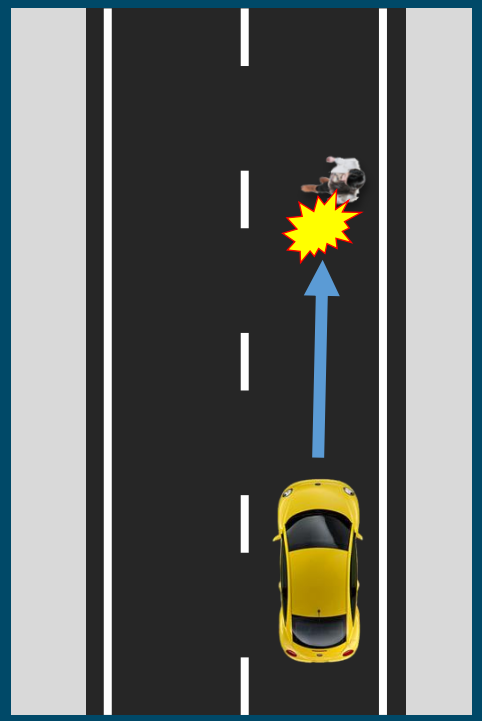
Along/run-off crashes



Crossing side road

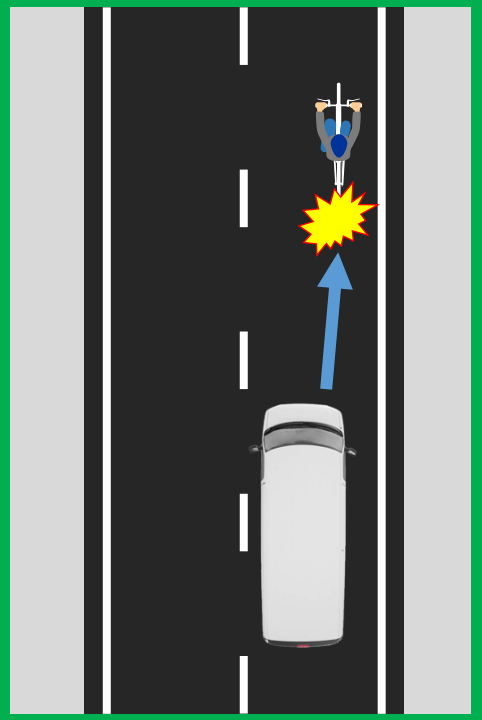


Crossing inspected road

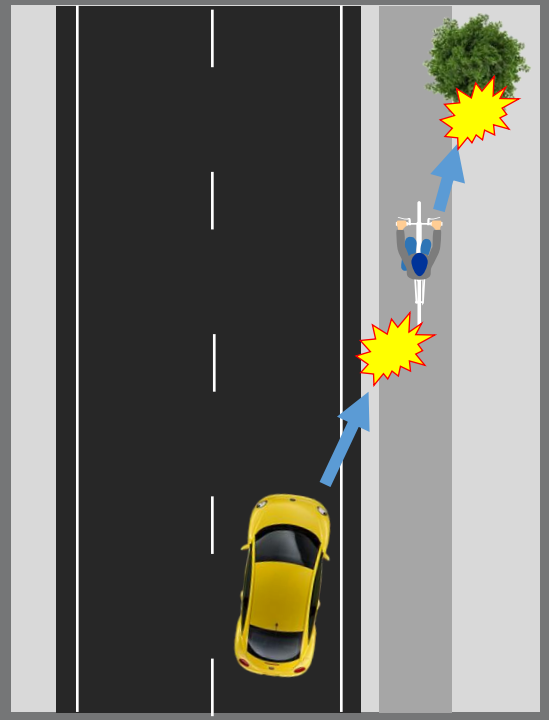


Bicyclist Crash types

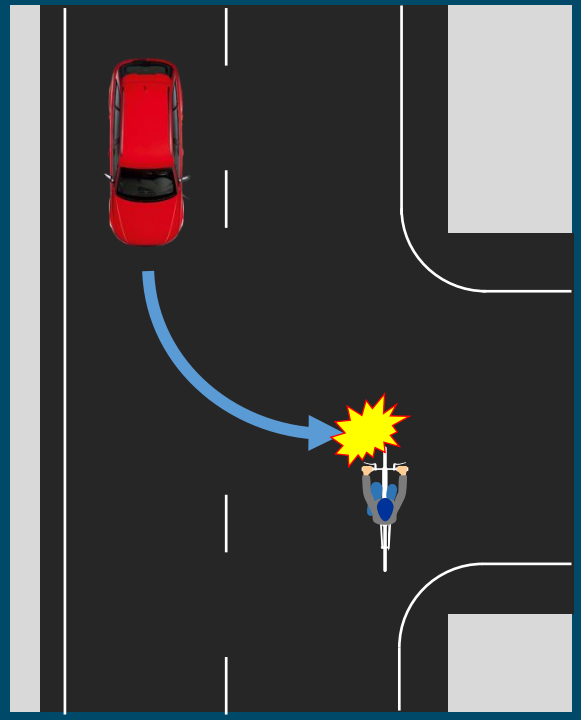
Along crashes



Run-off road

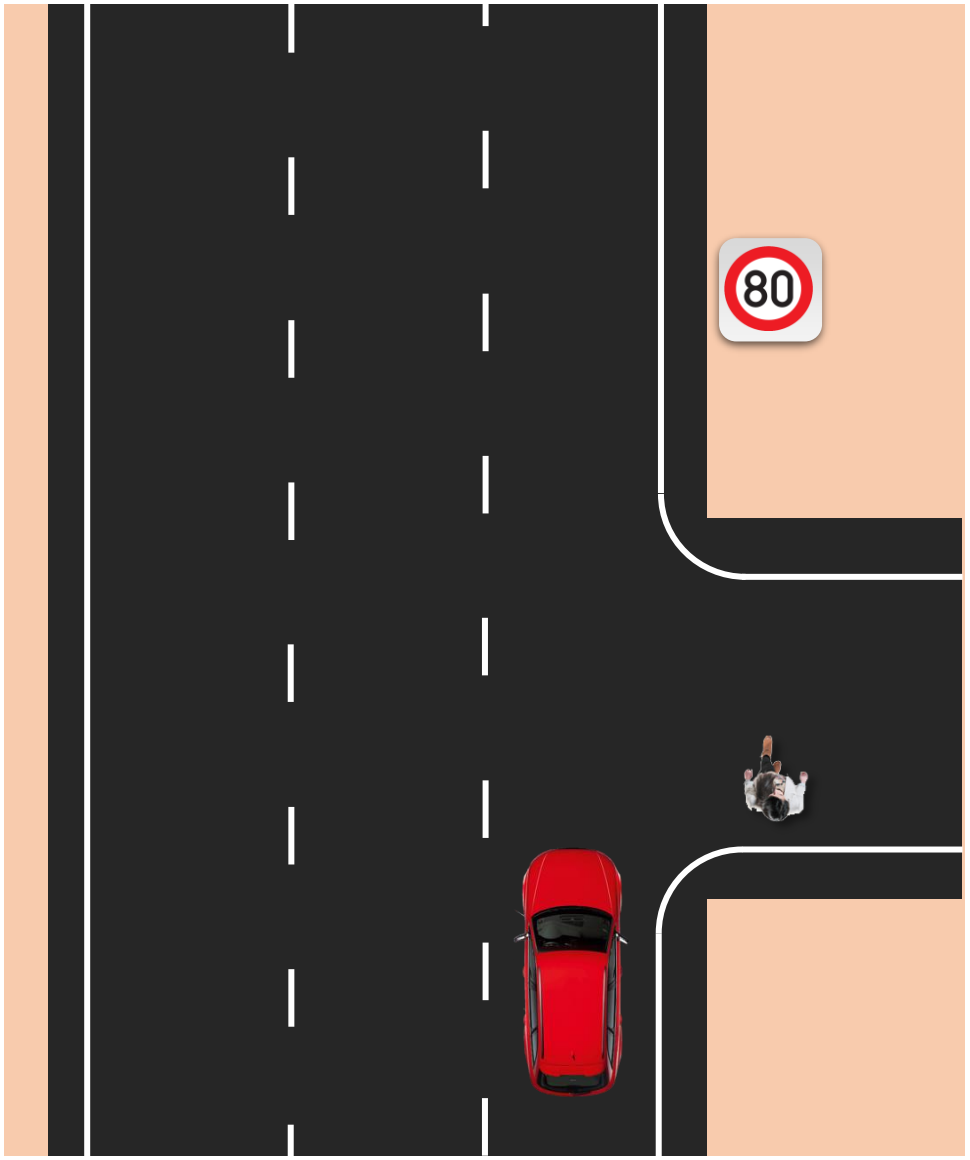


Intersection crash

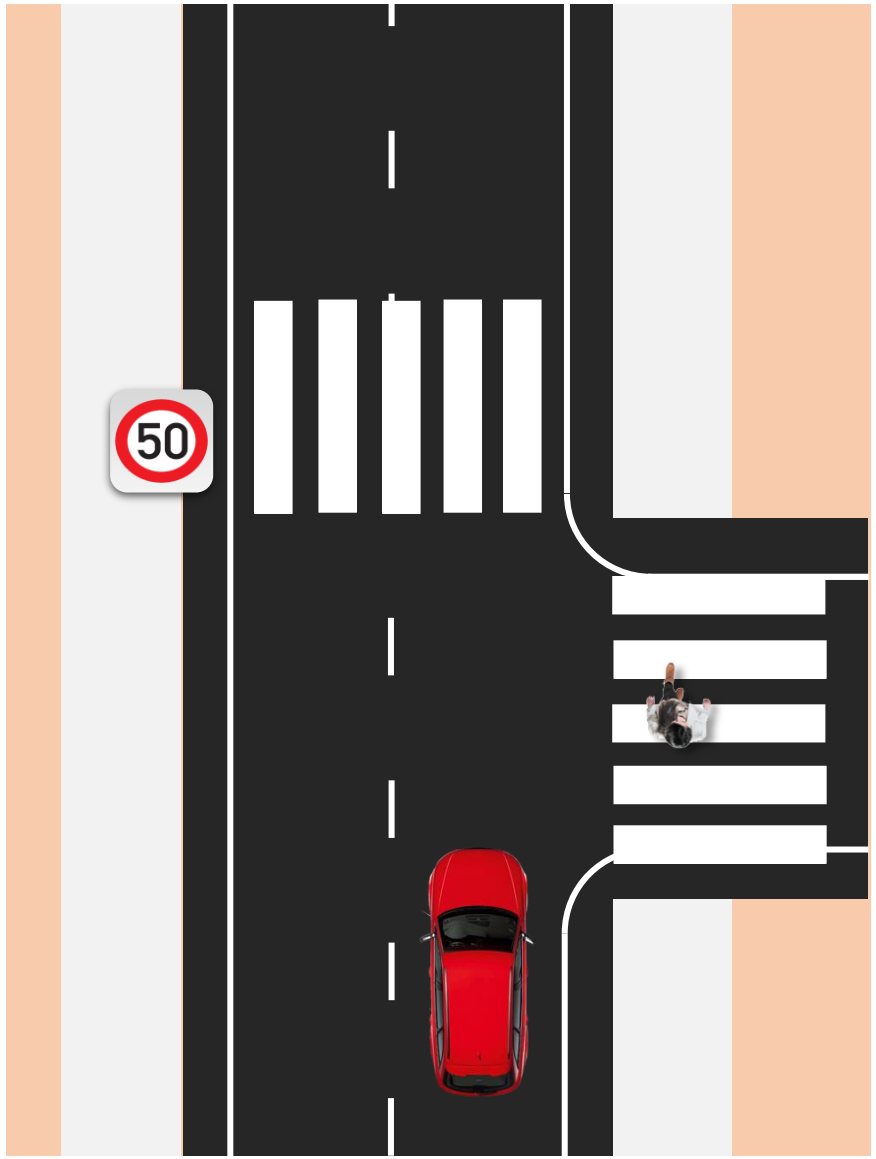


What does a 5-Star street look like?

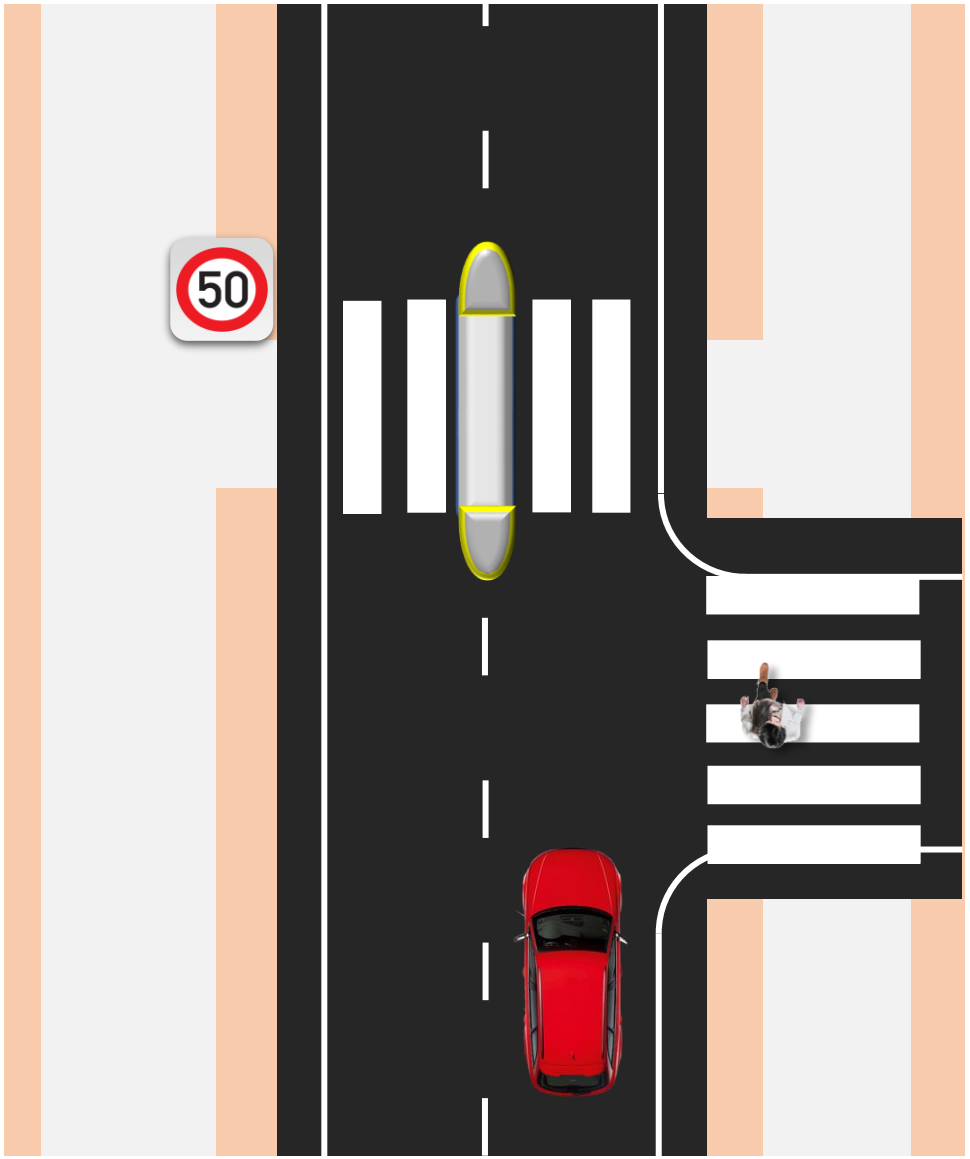
Source: NACTO Global Street Design Guide



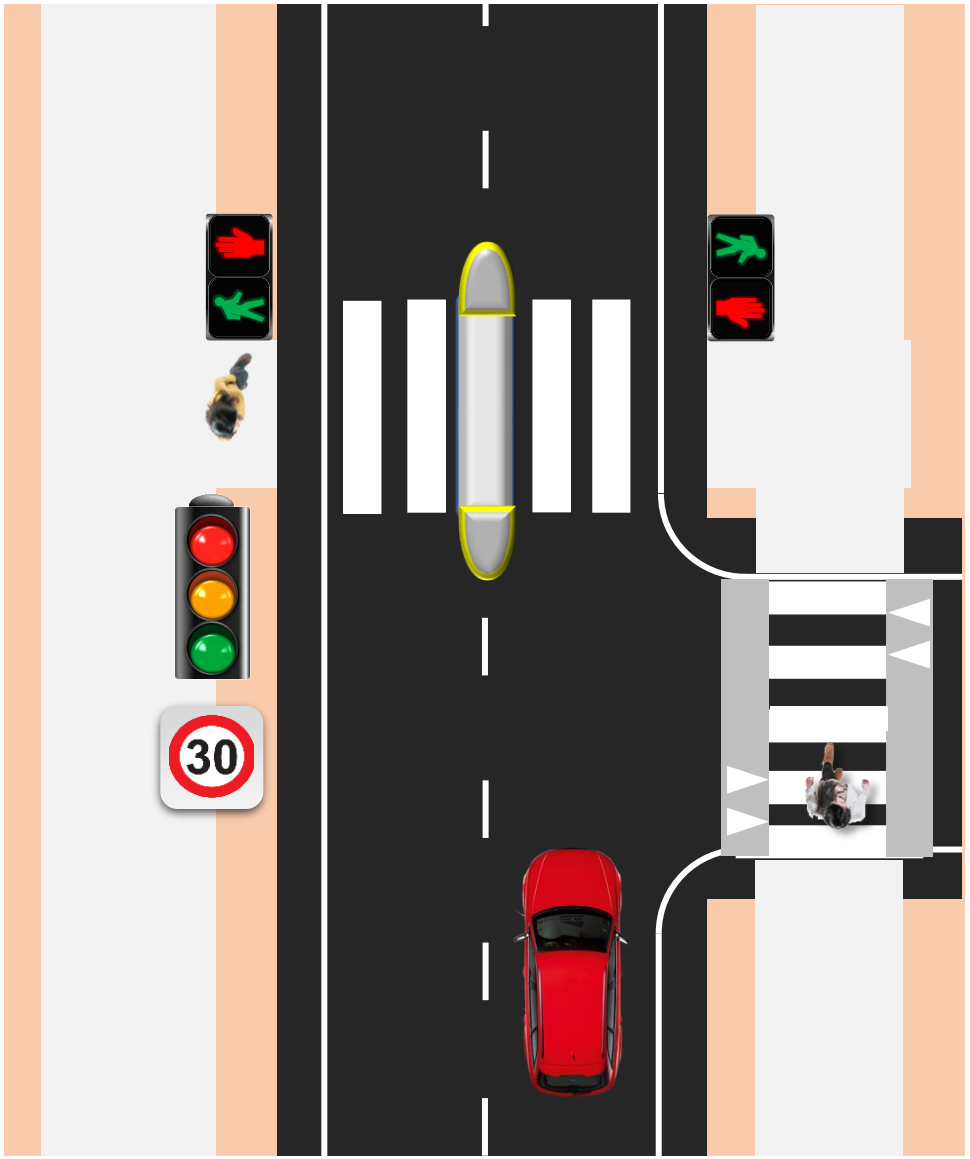
- High speed environments
- Multiple lanes
- Lack of safe sidewalks and crossing facilities



- Low to moderate speed environments, and/or
- Sidewalks and crossing facilities provide moderate level of safety for the road infrastructure and traffic speeds (e.g. number of lanes)



- Low speed environments, and/or
- Sidewalks and crossing facilities provide high level of safety for the road infrastructure and traffic speeds (e.g. number of lanes)

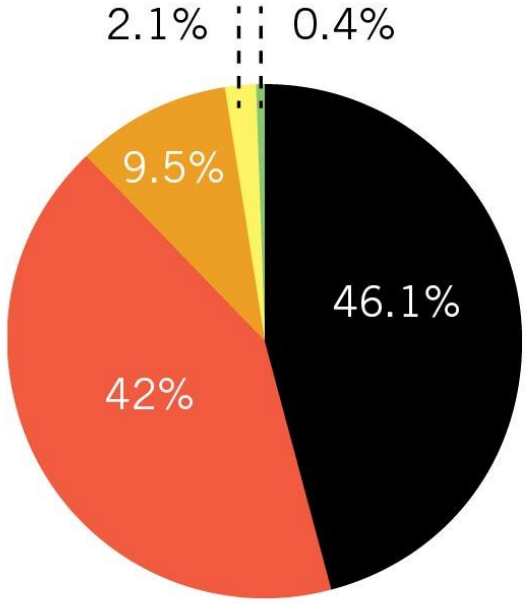


- Low speed environments, and/or
- Sidewalks and crossing facilities provide very high level of safety for the road infrastructure and traffic speeds (e.g. number of lanes)

KPIs: How safe are the world's roads for….

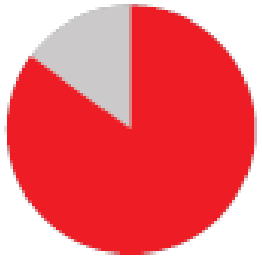
Pedestrians

88%
of travel is only 1-2 stars for pedestrians

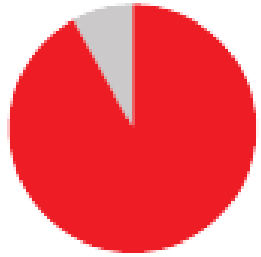


★ 1-star ★★ 2-star ★★★ 3-star ★★★★ 4-star ★★★★★ 5-star

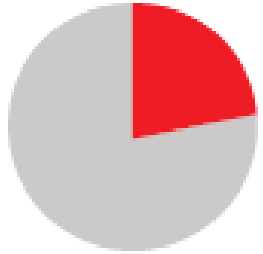
85%
of roads where pedestrians are present and traffic flows at 40km/hr or more have **no formal footpaths or sidewalks**



92%
of roads where pedestrians cross and traffic flows at 40km/hr or more have **no pedestrian crossing facilities**



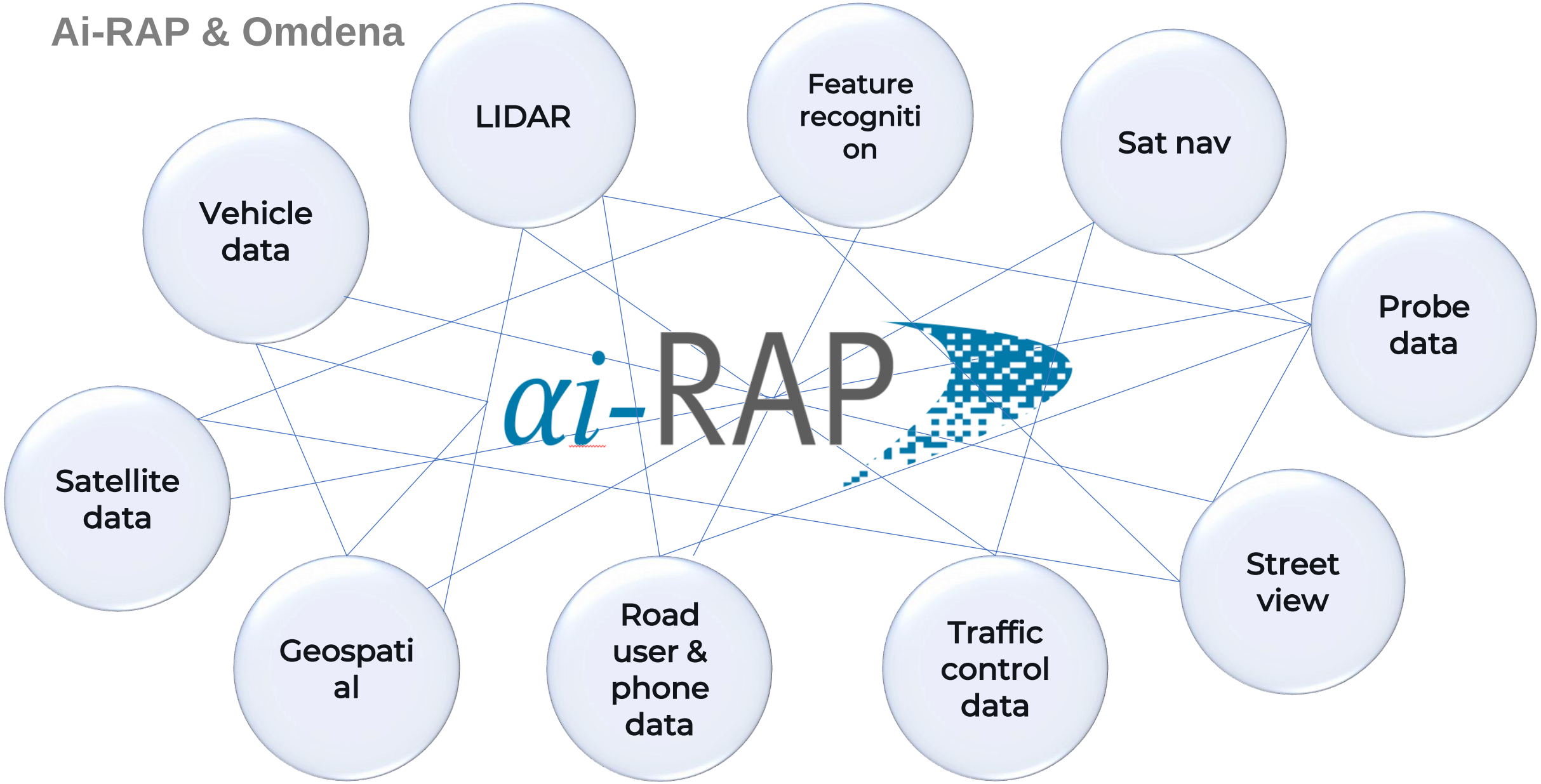
22%
of pedestrian crossings are **poorly signed or maintained**



www.vaccinesforroads.org

Based on 400 million+ data points covering 700 billion vkt / year

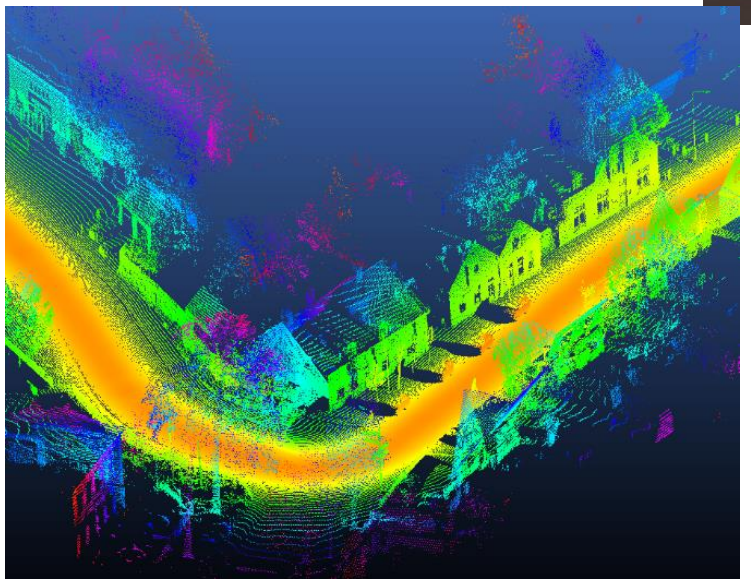
Ai-RAP & Omdena

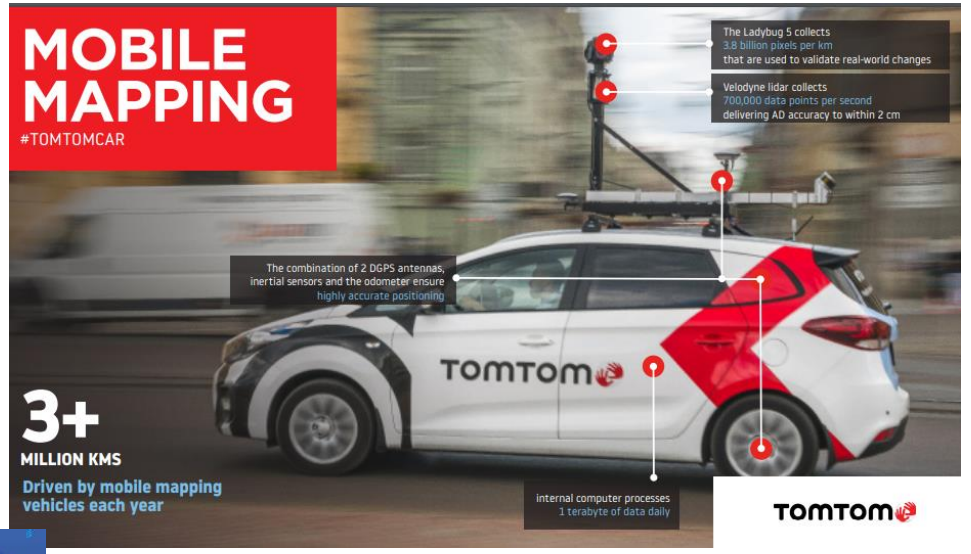


Ai-RAP: Source Data Example

MoMa Data:

Terrestrial LiDAR (.Las)
Panoramic Imagery (.Jpg)





MultiNet-R content

All advanced navigable, basic navigable, and basic routing and display geographies are available in MultiNet-R format. See map coverage sheets for more information.

The following map enhancement products are available as integrated MultiNet-R modules:

- Address Points
- ADAS Map
- ADAS Map with Signs Package
- Buildings
- Junction Views
- Logistics
- Points of Interest
- Speed Profiles
- Voice Maps

And, the following map enhancement products are included in the core MultiNet-R module:

- Administrative Areas
- Locality Index
- Post

Product formats

TomTom Multinet-R is delivered as Apache Avro files with a toolset that supports load to the following databases:

- PostgreSQL
- Microsoft SQL Server
- SQLite

This database loader toolset supports:

- Merge and load multiple modules or a selection thereof
- Merge or clip geographical zones
- Output as new Avro or CSV file after merge or clip operation

Traffic Stats

https://www.tomtom.com/products/historical-traffic-stats/

Historical traffic covering 78 countries

https://move.tomtom.com/register
Free Trial

- April 2019 data, 90 days, 20 Reports

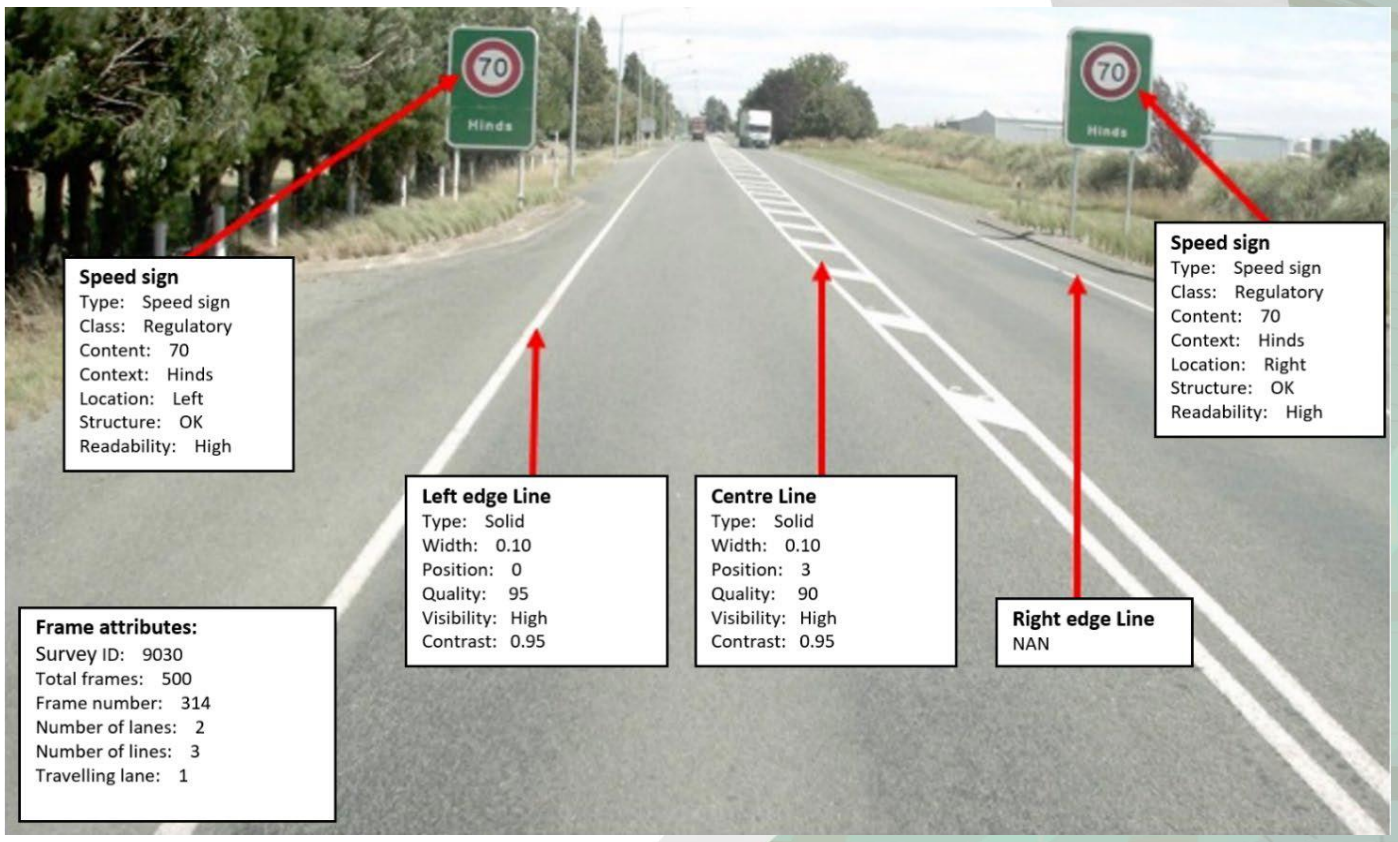
Barcelona, Spain: 24 hours of Probe

New Delhi, India: 24 hours of Probe

CAV road readiness – Physical and Digital Attributes

- **Austroads Report** - analysed the readiness of the infrastructure for 8 million individual line segments and over 8 000 signs on a 25 000 km sample of the road network in Australia and New Zealand.

- **CEF project- SLAIN (2019-2021),** collect data and in particular parameters (specifications) for measuring and recording physical road attributes, specifically road markings/lines and signage, 2,000 Km of TEN-T roads in 4 different countries – Croatia, Greece, Italy, and Spain.



Road users can map their safest route and mode-choice

Manual coding is a thing of the past

The 2030 vision

Single attributes are available on a scale and frequency for all roads worldwide

Road authorities know which roads have 75% of travel

…and those roads are 3 Star or better

The life-saving potential of achieving >75% of travel on 3-star or better roads worldwide

	Low Income	Lower-Middle Income	Upper-Middle Income	High-Income	Worldwide
Deaths and injuries saved over 20 years	**17** million people	**44** million people	**35** million people	**5** million people	**100** million people
Return on Investment	**$18** for every $1 invested	**$11** for every $1 invested	**$15** for every $1 invested	**$4** for every $1 invested	**$8** for every $1 invested

https://www.vaccinesforroads.org/business-case-for-safer-roads/

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The road safety potential of big data: Ai-RAP and achieving the UN Road Safety Targets

Lina Konstantinopoulou

Secretary General, EuroRAP

Annual Conference 2020

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