



Data to support Management of Powered Two-wheeler Risks

Greg Smith, iRAP

SECOND WORKSHOP TOWARDS THE ESTABLISHMENT
OF A ROAD SAFETY OBSERVATORY IN ASIA-PACIFIC

iRAP



www.irap.org



About iRAP:

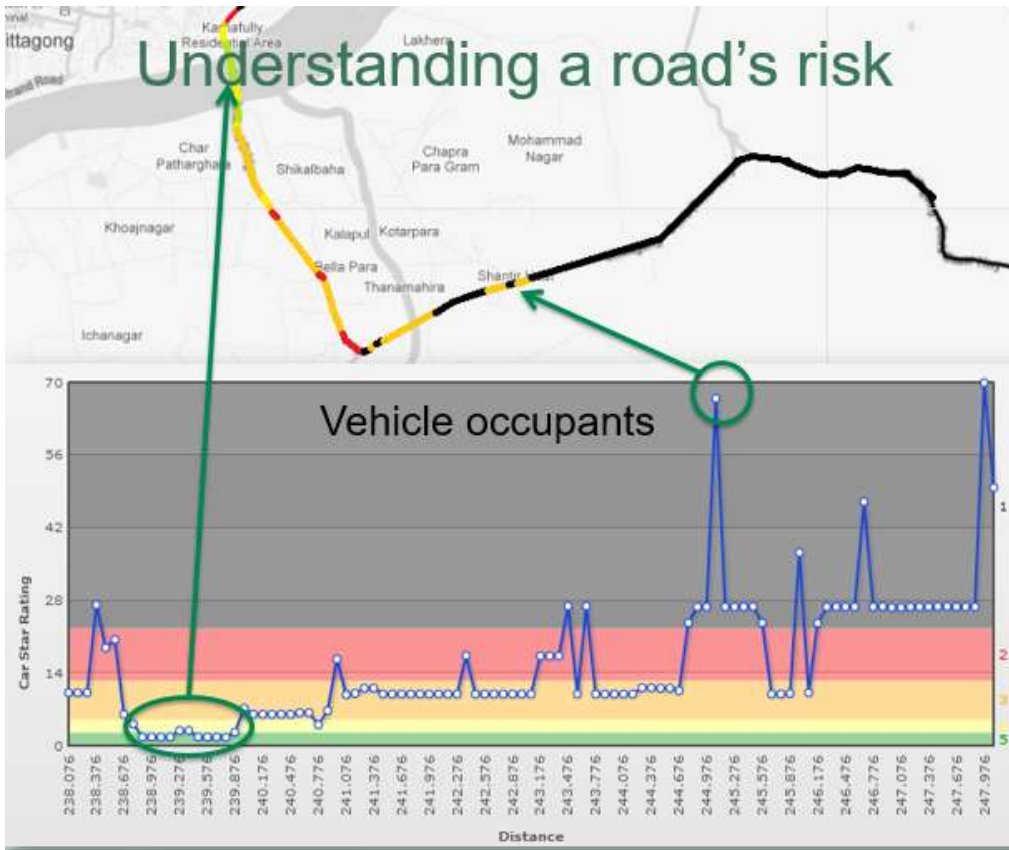
Registered charity

Vision: a world free of high risk roads

Global standard for road infrastructure safety performance

100+ countries

Star Ratings



China
Bicyclists / e-bicyclists: ★★★★★

- Bicycle lane
- Street lighting
- Good pavement
- No intersection
- No vehicle parking
- Two lanes each direction
- Good sight distance
- 50km/h

Cayman Islands
All road users: ★★★★★

- 56km/h (35 mph)
- Footpath and crossing
- Straight
- Paved shoulder
- Street lighting
- No bicycle lane
- Intersection
- Poor delineation

Philippines
Pedestrians: ★★★★★

- One lane each direction
- Good sight distance
- 80km/h
- Narrow paved shoulder
- No formal footpath
- No pedestrian crossing
- No school zone
- No street lighting

Star Rating process



Road Survey

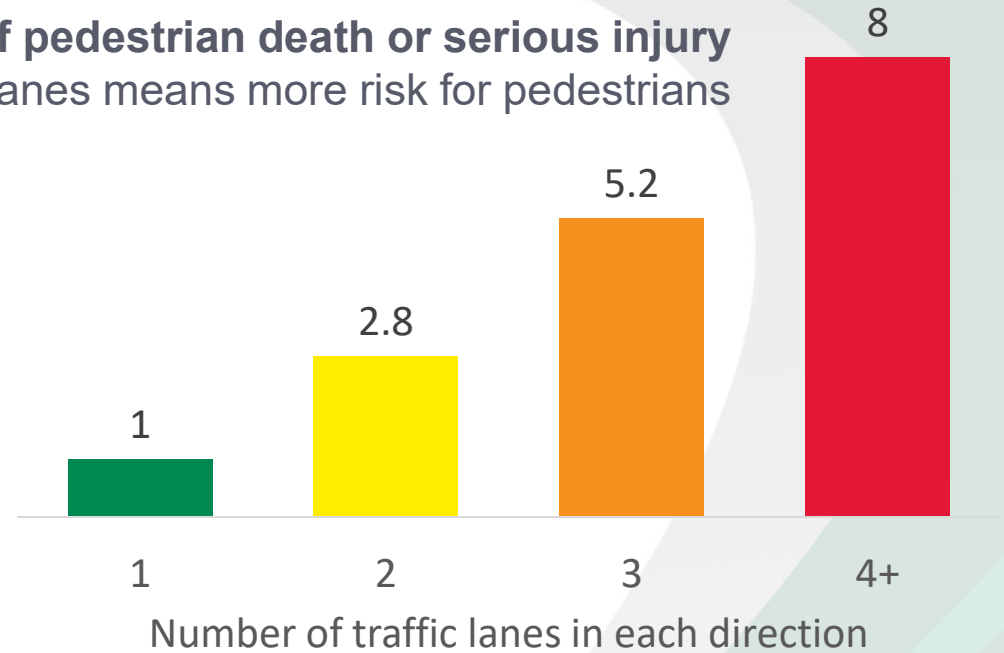


Road Coding



Star Ratings

Risk of pedestrian death or serious injury
More lanes means more risk for pedestrians



SNAPSHOT: MEASURING RISK

iRAP inspections involve surveys to collect digital, panoramic images or videos of roads and GPS location information. These data are then used to record (or code) 50 types of road attributes that are known to influence the likelihood of a crash and its severity.²³ The road attributes, which are recorded for each 100 metre segment of road, include those that are known to affect risk for vehicle occupants, motorcyclists, pedestrians and bicyclists.²⁴ The inspections create a permanent image, location and road attribute database that can easily be reviewed by local engineers and planners.

Pavement

Poor road surfaces, such as those with holes, standing water and debris, mean it is more likely that vehicles will swerve out of their lane. Furthermore, in an emergency vehicles can stop faster on skid-resistant pavements.

Geometry

The number of lanes, width of lanes, curves, dips, crests and slopes all effect crash risk.

Footpaths

Obstructed footpaths (as is the case here) mean it is more likely that pedestrians will walk on the road, especially when it is raining or when visibility is poor.

Shoulders

When a driver accidentally travels onto the road shoulder (not present here) the risk of crashing will be less if the vehicle can either stop on the shoulder or safely travel back into the traffic lane. Shoulders can also provide space for slower-moving non-motorised vehicles.

Speed

The risk of death and serious injury increases significantly with speed. If a pedestrian is struck by a car travelling at 60km/h, they face a 90% chance of being killed.

Intersections

Intersection crashes are one of the most common types of crash problem, particularly in urban areas, rural areas, or where vehicle speeds are high. The consequence of collisions at intersections can be particularly severe.

Delineation

Centre and edge delineation treatments (not present here) help drivers judge their position on the road, and provide advice about conditions ahead.

Crossings

Most pedestrian deaths occur while the pedestrian is attempting to cross the road. Pedestrian crossings (present here, but poorly designed), including signalised crossings, refuge islands, bridges, and traffic calming treatments, have the potential to reduce risk.

Lighting

Visibility is an important factor in creating a safe environment, particularly at intersections and where vulnerable road users are present.

Roadsides

Roadside hazards (like this pole) increase the risk of death and serious injury when a vehicle runs off the road.

Bicyclists

Bicyclists (and people using non-motorised vehicles) are amongst the most vulnerable of all road users. Bicyclists are safest when they have paths or lanes and do not need to mix with fast-moving traffic.

Median

Medians physically separate opposing traffic streams and help stop vehicles travelling into opposing traffic lanes. They can also help pedestrians cross the road or restrict their access at unsafe places.

Traffic mix

Mixing fast moving cars, trucks and buses and slow moving auto-rickshaws and tractors increases the risk of crashes, especially head-on and rear-end crashes.^{25,26,27}

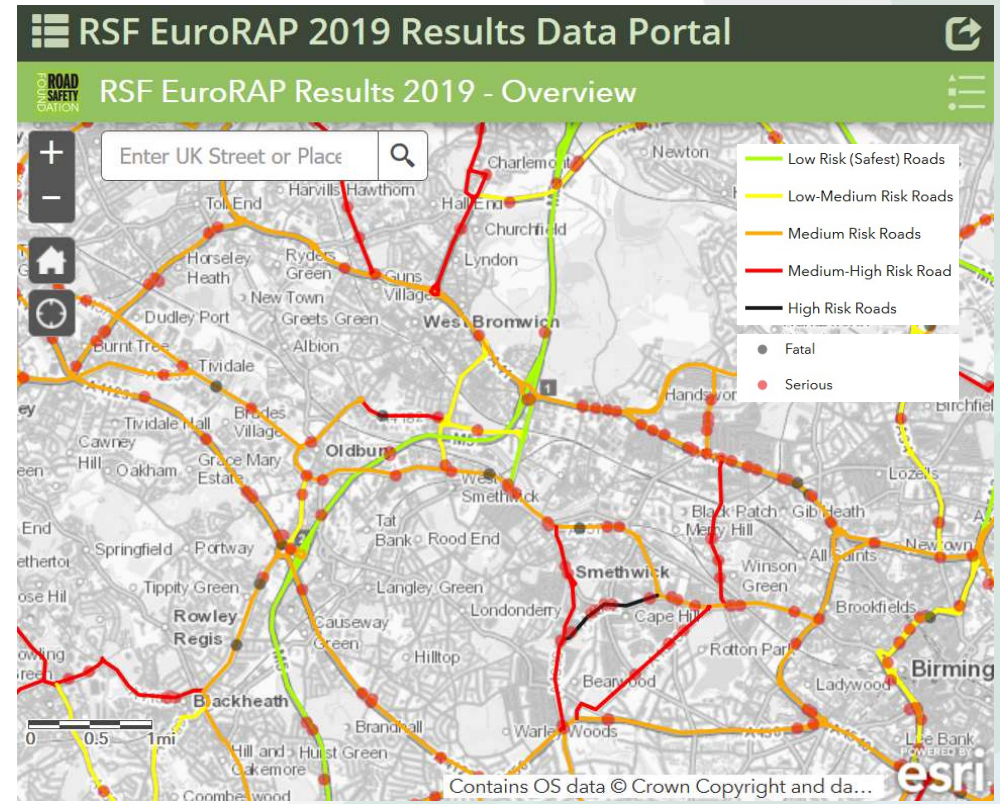
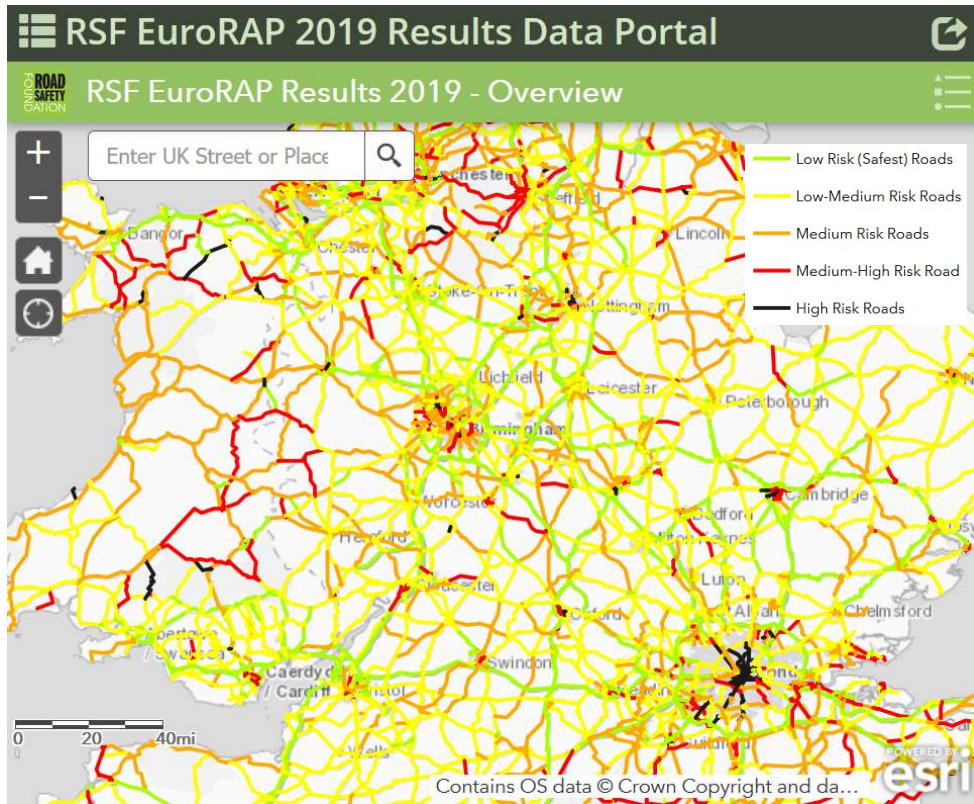
<https://www.irap.org/specifications/>



iRAP Coding Manual
Drive on the right edition

www.irap.org
Because every life counts.

Crash Rate Risk Maps



iRAP assessments

- 23 countries with some iRAP Star Rating data in ESCAP

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

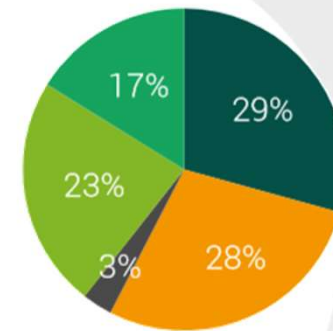


Target 4: By 2030, more than 75% of travel on existing roads is on roads that meet technical standards for all road users that take into account road safety.





WORLD



■ Driver / passengers of 4-wheeled vehicles

■ Motorized 2-3 wheelers

■ Cyclists

■ Pedestrians

■ Others / unspecified

WHO Global Status Report on Road Safety 2018

General Santos-Davao-Cagayan de Oro, Philippines



~315km

~4

Fatalities per week



83% 1- or 2-stars



1/4 of traffic
3/4 of deaths



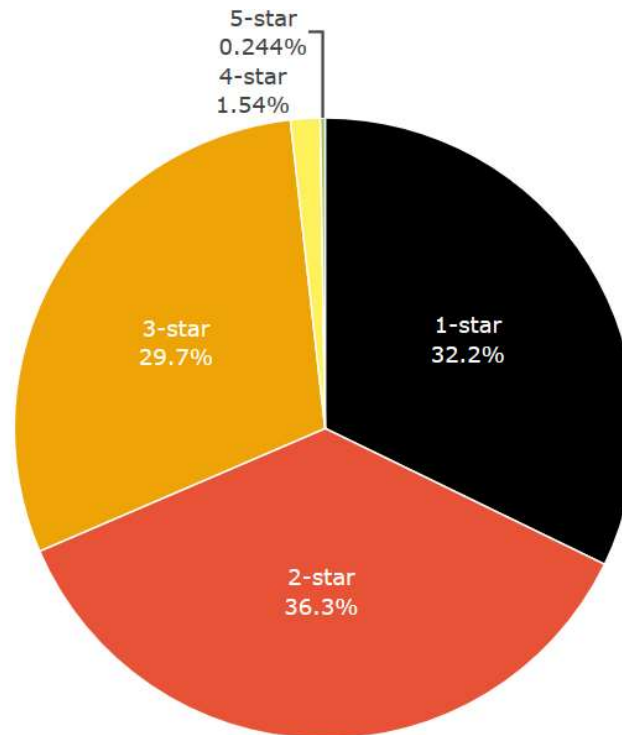
Distance 0
S00577MN, Sayre Highway
Motorcyclist Star Rating: ★★

- Operating Speed: 55 km/h
- No Paved Shoulder
- Centreline Median
- Poor Delineation
- Three Medium Lanes
- Medium Curve
- Good Pavement Condition
- 4-leg unsignalized intersection
- Distance of Road Hazard: 0 to 1 m
- Poles on the side of the road

Motorcyclist Star Ratings

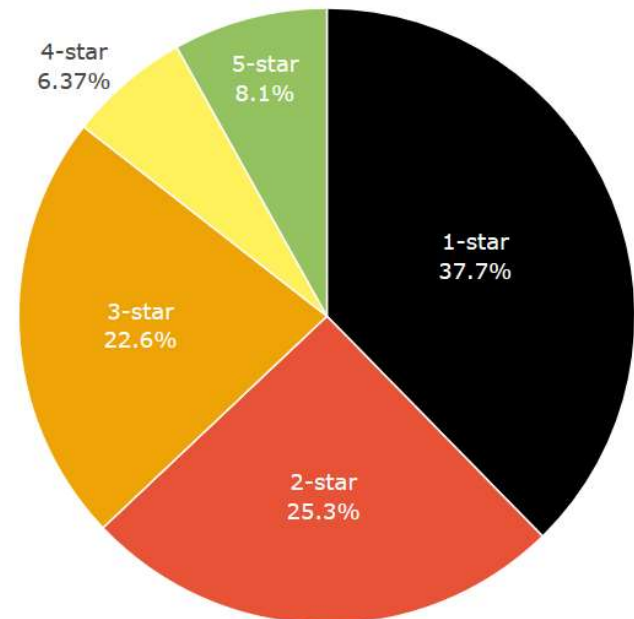


Western Pacific Region



Total Motorcyclist distance: 70,049 km

South East Asia Region



Total Motorcyclist distance: 29,892 km



Malaysia

31 million people

7 kW
>60 km/h

0.3 motorcycles
per person

**15 deaths per
100,000 pop**



Ho Chi Minh City

9 million people

7 kW
>60 km/h

0.9 motorcycles
per person

**5.8 deaths per
100,000 pop**



Shanghai

24 million people

0.25 kW - 4 kW
<25 km/h - >50 km/h

0.4 e-bikes
per person

**2 deaths per
100,000 pop**



Netherlands

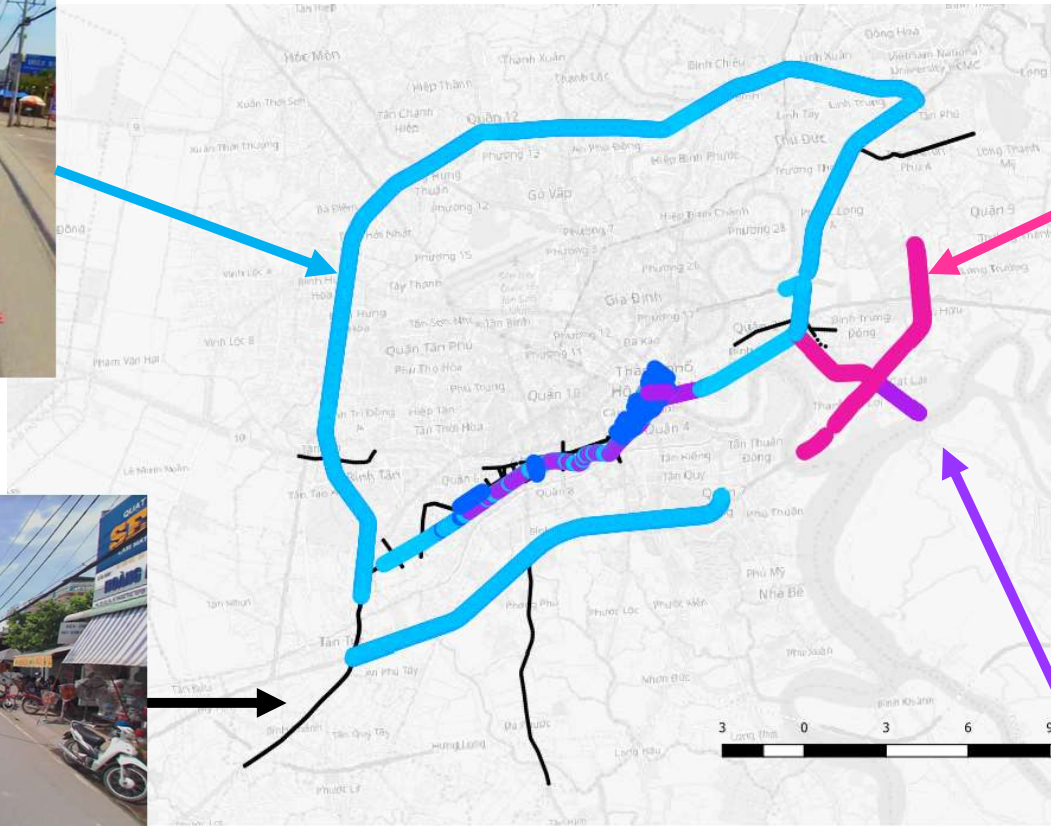
17 million people

0.25 kW - 118 kW
15-25 km/h - >100km/h

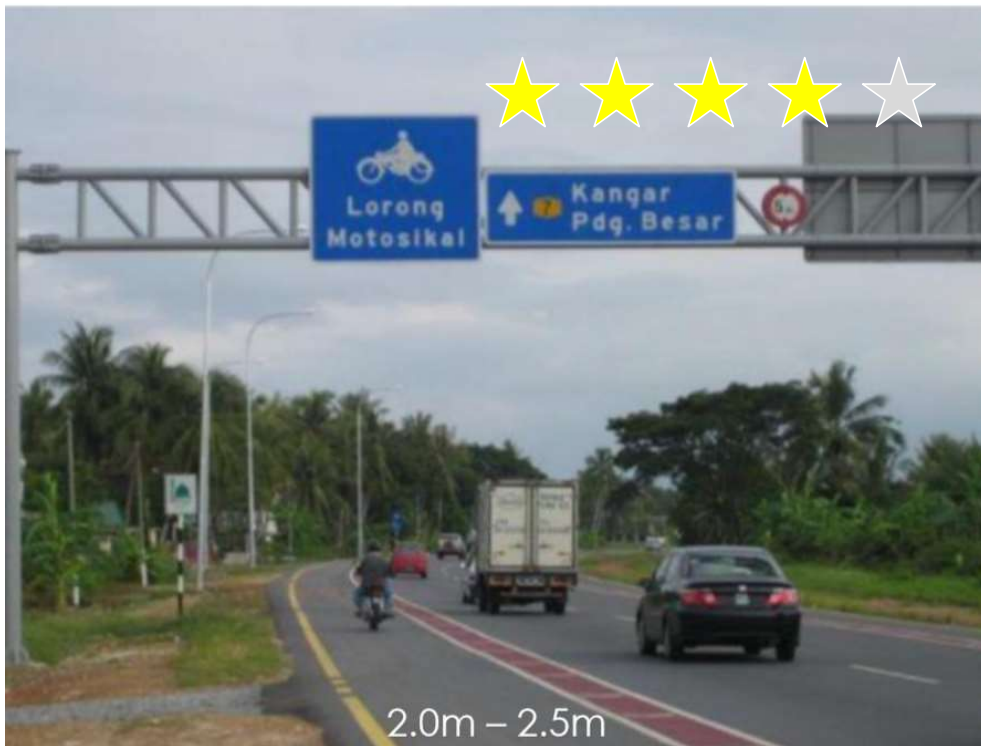
1.3 bicycles, e-bikes and
motorcycles per person *

**2 deaths per
100,000 pop**

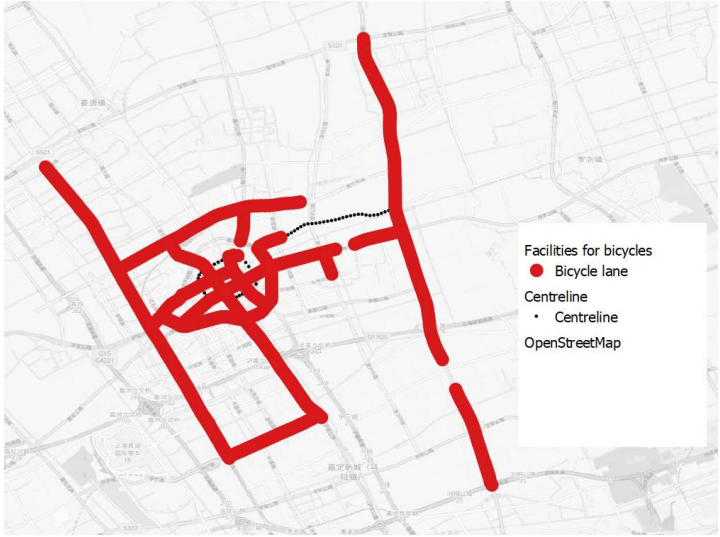
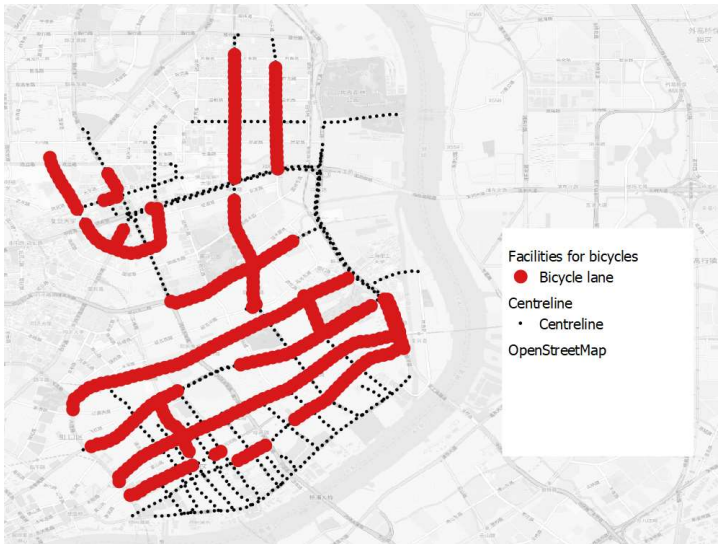
Motorcycle facilities in Ho Chi Minh City, Vietnam



Motorcycle lanes in Malaysia



Bicycle / e-bike lanes in Shanghai, China



Bicycle / e-bike lanes in Netherlands

Total bicycle paths: 35,000km





Malaysia *

~500km motorcycle lanes
250,000km roads

Lane ratio: 0.2%

* National



Ho Chi Minh City *

204km motorcycle lanes
308km roads

Lane ratio: 66%

*Sample of local and major roads



Shanghai *

118km bike/e-bike lanes
184km roads

Lane ratio: 64%

*Jiading and Yangpu
> 10% of Shanghai's pop

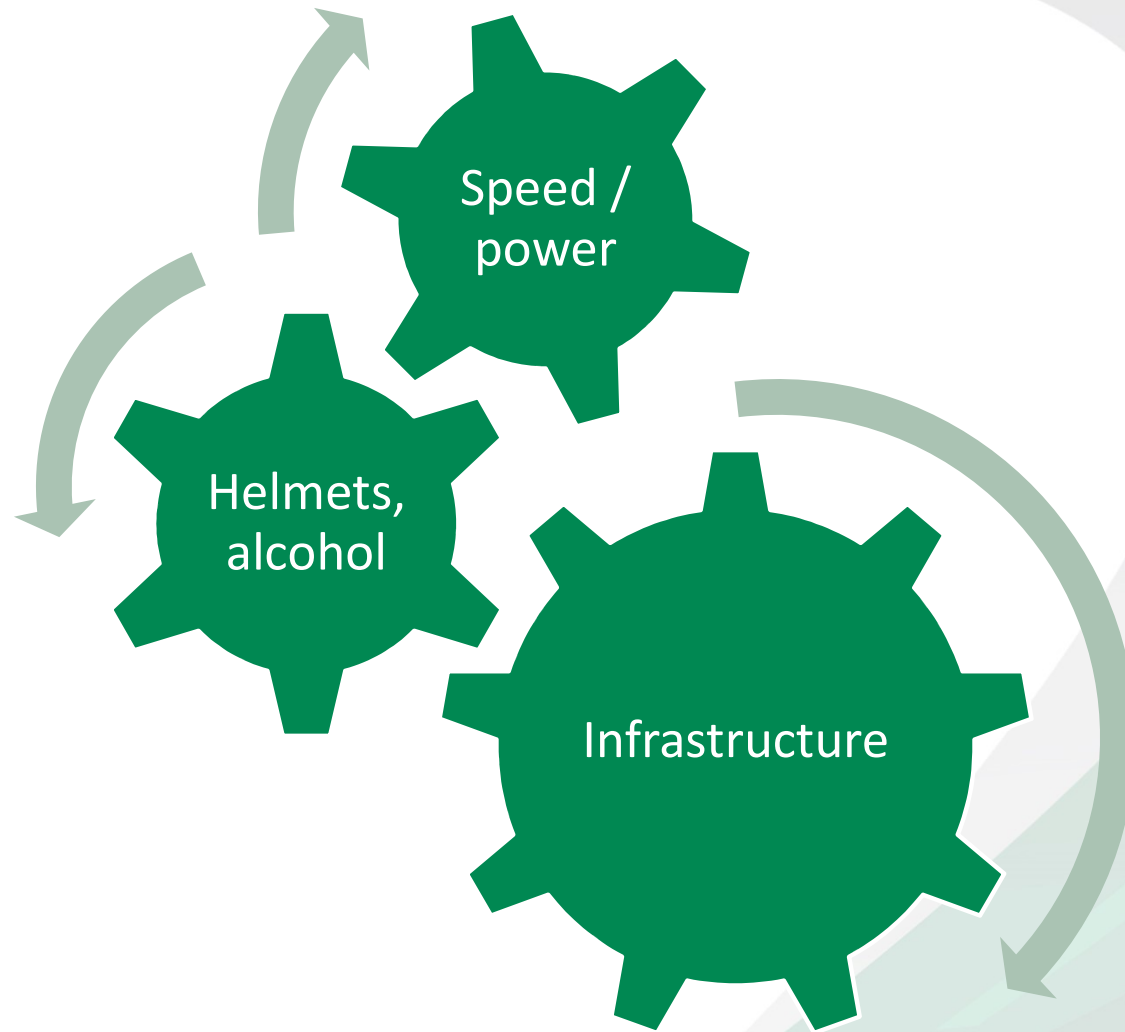


Netherlands *

35,000km bike lanes
139,000km roads

Lane ratio: 25%

* National



Motorcycle lane in Indonesia



Conclusion

- Road infrastructures influence risk and therefore is a basis for comparisons
- Extensive iRAP data is already available
- Data sampling is valuable – we don't need to assess all roads before we make meaningful comparisons
- Star Ratings methodology is available for all

For more information

-  greg.smith@irap.org
-  +63 995 144 9627
-  [greg_smith_321](https://twitter.com/greg_smith_321)
-  <https://www.linkedin.com/in/greg-smith-42483118/>

