

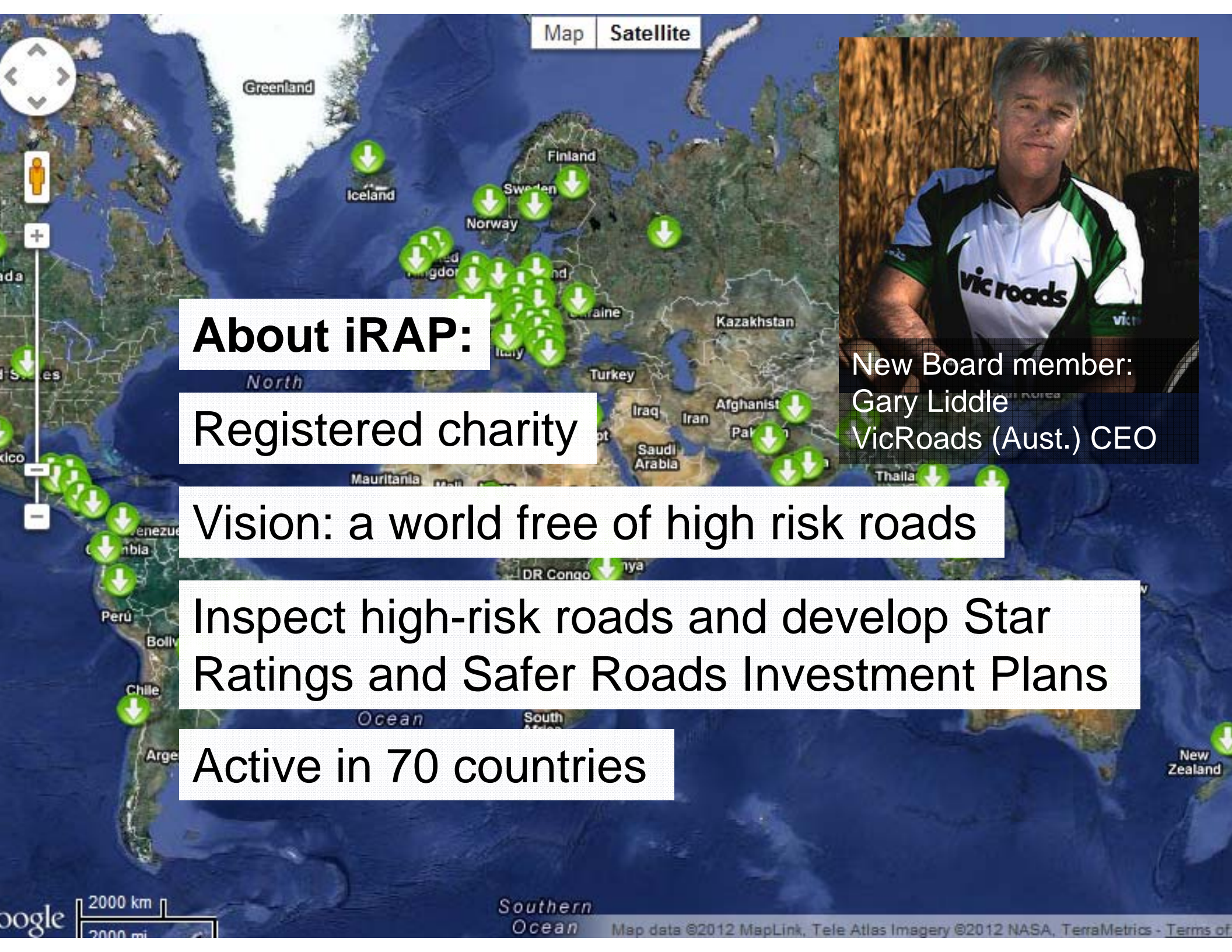
# India Free of High Risk Roads



Greg Smith, iRAP  
IRF India Conference  
5 October 2013







**About iRAP:**

Registered charity

Vision: a world free of high risk roads

Inspect high-risk roads and develop Star Ratings and Safer Roads Investment Plans

Active in 70 countries



New Board member:  
Gary Liddle  
VicRoads (Aust.) CEO

19

India death rate  
per 100,000 population

5

Japan death rate  
per 100,000 population

# A Safe Road Transport System

Safe Speed

Safe Vehicle

Criteria:

- Five-star rated by EuroNCAP
- Electronic stability control

Safe Road

Criteria:

- Four-star rated by EuroRAP

Safe Road User

Criteria:

- Wears a seat belt
- Follows the speed limit
- Sober

Biomechanical limits that the road user can tolerate without sustaining severe injuries





# ≡ MAKE ROADS SAFE TIME FOR ACTION



“...design briefs given to consulting engineers for new road schemes should make clear that the desired design speeds stated for a new road are subject to achieving minimum safety ratings.”



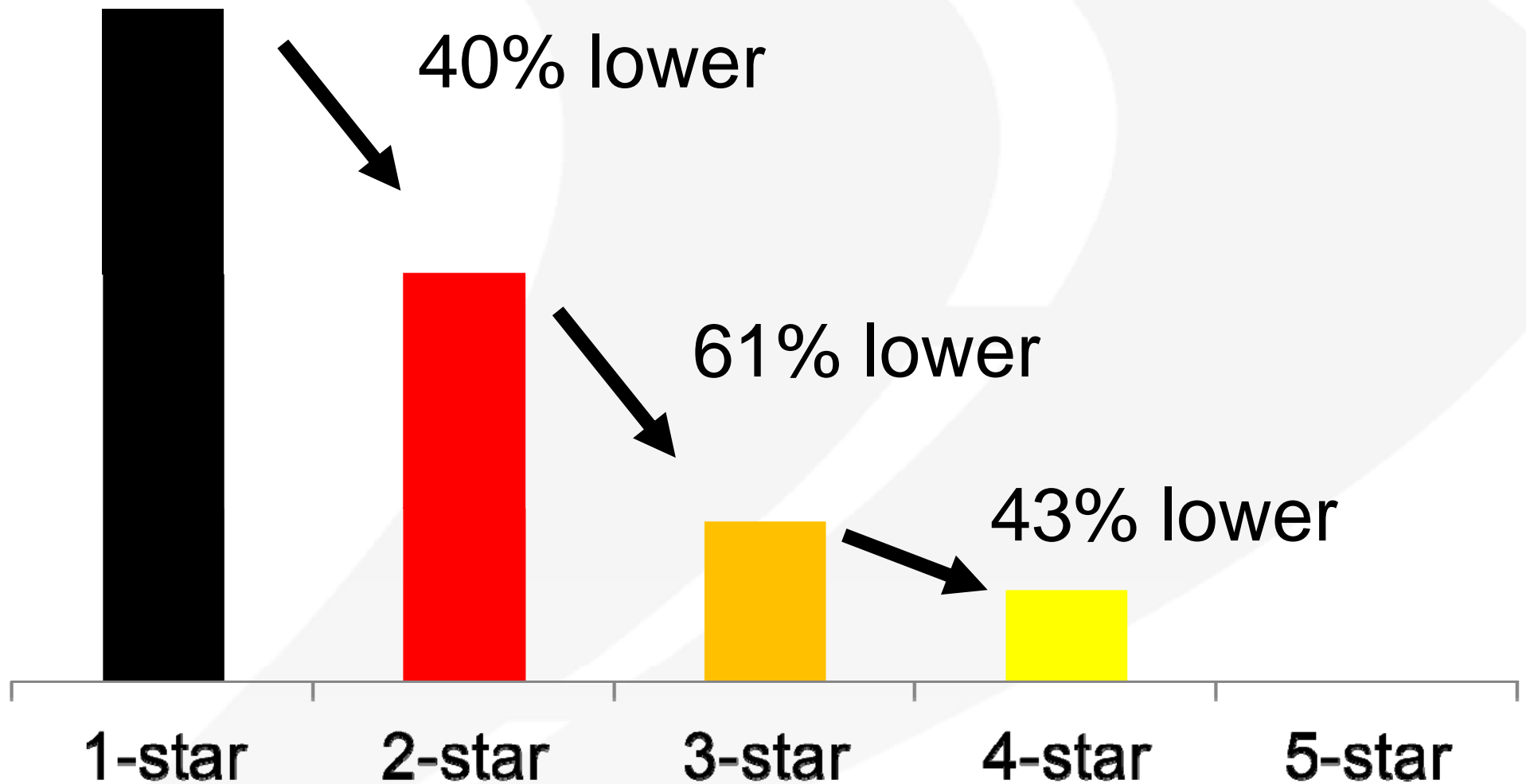
**Commission for  
Global Road Safety**

*“... Roads of National Significance will be implemented with a minimum 4-star KiwiRAP rating...”*



**Safer Journeys**  
Action Plan 2013-2015

# Crash costs decline with better Star Ratings



McInerney, R. and Fletcher, M. (2013). *Relationship between Star Ratings and crash cost per kilometre travelled: the Bruce Highway, Australia*





Palakkad to Shoranur (6.9km)

Vehicles: ★ ★ ★ ★

60 km/h

Undivided

No intersection or property access

Distance to roadside hazard >5m

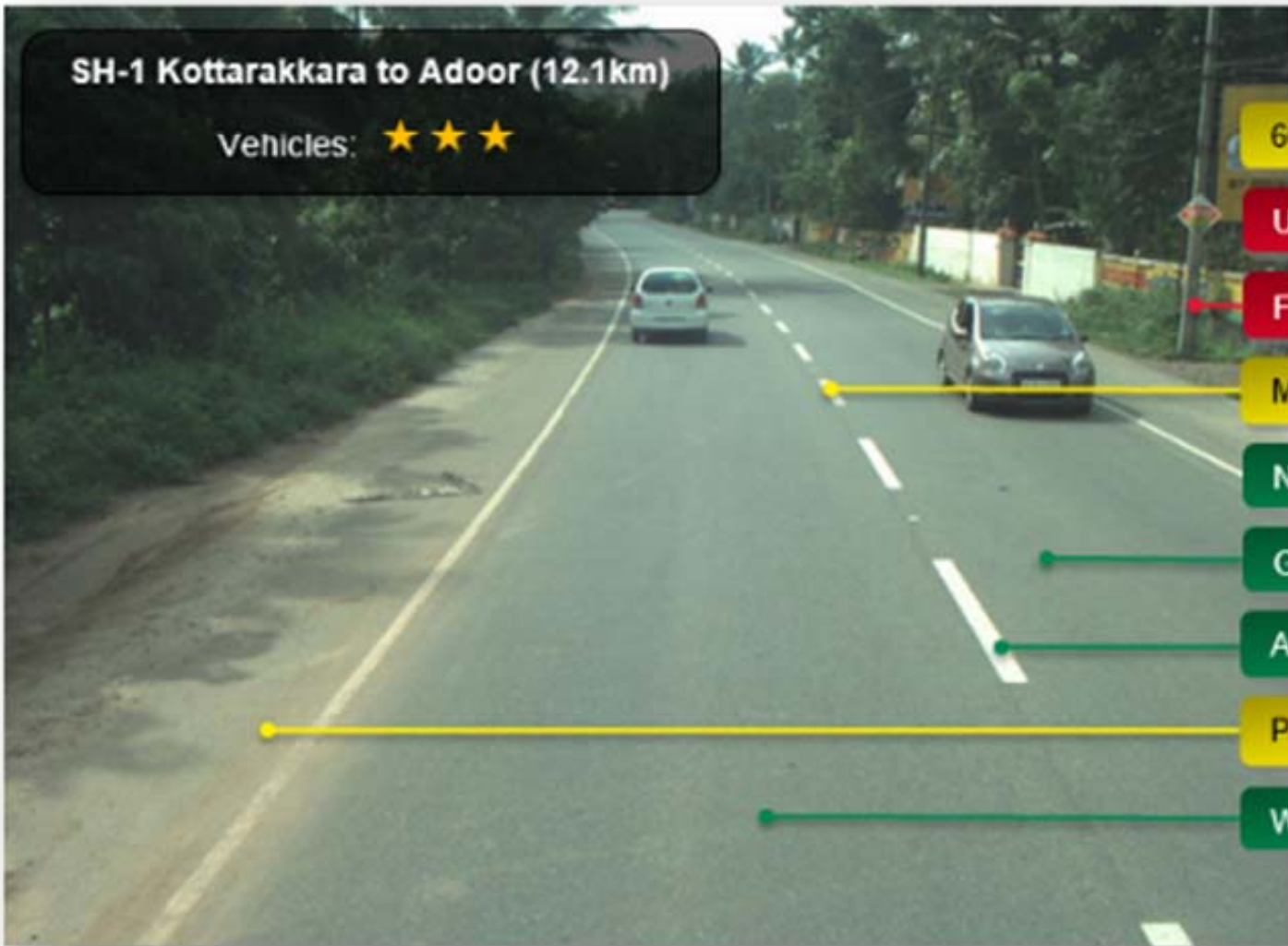
Straight horizontal curvature

Wide lane widths

Paved shoulder

Adequate delineation

Good road surface condition



SH-1 Kottarakkara to Adoor (12.1km)

Vehicles: ★★ ★

60 km/h

Undivided

Fixed objects (0-5m)

Moderate curve

No intersection

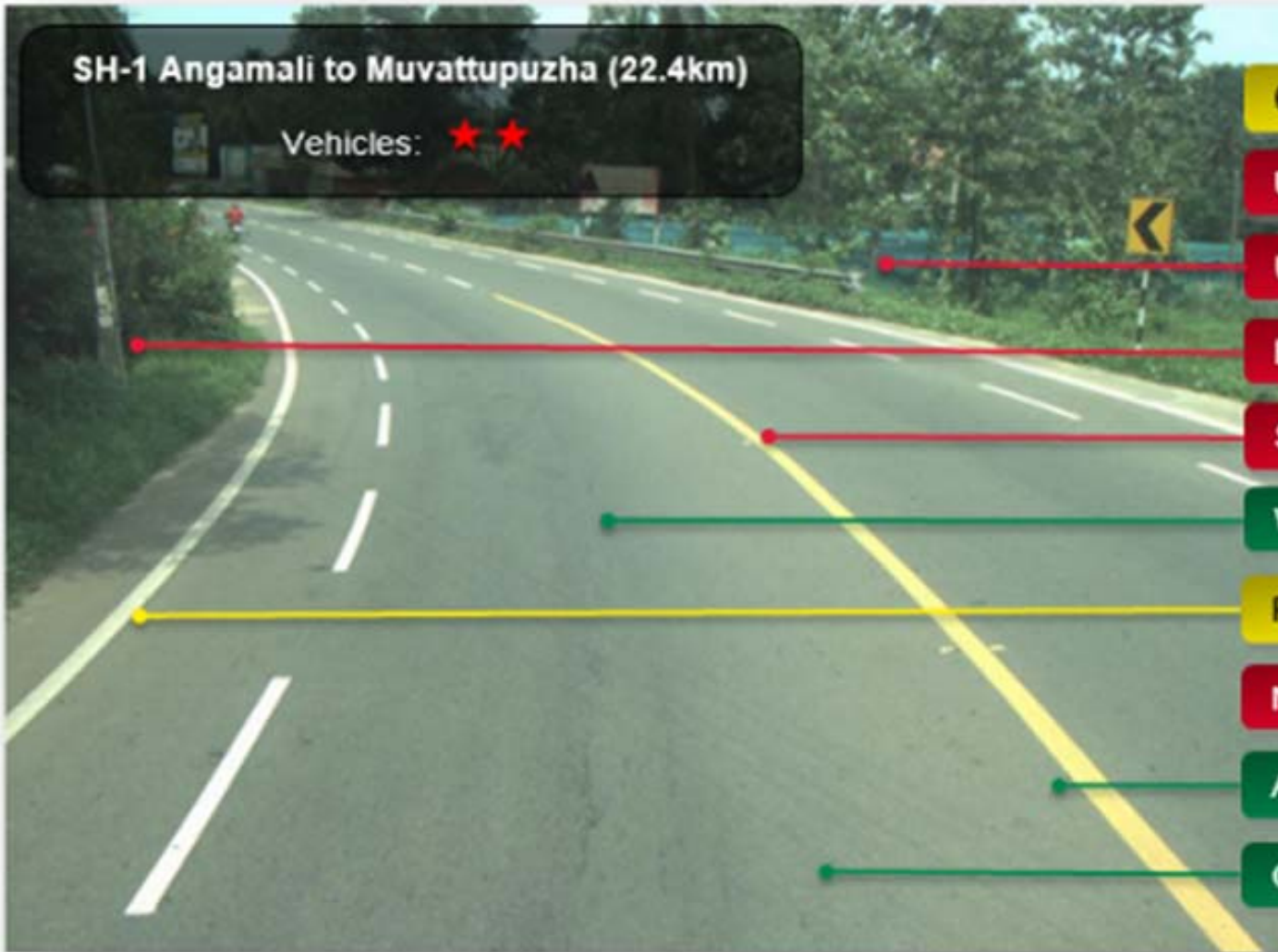
Good road surface condition

Adequate delineation

Paved shoulder

Wide lane widths





**SH-1 Angamali to Muvattupuzha (22.4km)**  
Vehicles: ★ ★

60 km/h

Undivided

Unprotected barrier end

Fixed objects (0-5m)

Sharp curve

Wide lane widths

Paved shoulder

No street lighting

Adequate delineation

Good road surface condition

SH-8 Punalur to Thodupuzha (10.3km)

Vehicles: ☆

60 km/h

Sharp curve

3-leg unsignalised intersection

Roadside hazards (within 5m)

Undivided

Poor delineation

Medium road surface condition

Medium lane widths

No paved shoulder



Kasaragod to Kanjanghai (14.8km)

Pedestrians: ★★☆☆



80 km/h

No pedestrian crossing facility

Low crossing demand

Straight horizontal curvature

Pedestrian footpath both sides

Physical barrier

1 lane per direction

SH-69 Thrissur to Kuttippuram (25.4km)

Pedestrians: ★ ★ ★

55 km/h

Unsignalised pedestrian crossing

Street lighting

Pedestrian footpath both sides

Pedestrian fencing

Paved shoulder

1 lane per direction

Straight horizontal curvature

Good road surface condition





SH-8 Punalur to Thodupuzha (37.0km)  
Pedestrians: ★ ★

55 km/h

No pedestrian crossing facility

No pedestrian footpath

Restricted sight distance

1 lane per direction

No paved shoulder

Unpaved shoulder

Medium road surface condition

Kasagarod to Kanjanghad (7.9km)

Pedestrians ☆

60 km/h

No pedestrian crossing facility

No pedestrian footpath

1 lane per direction

No paved shoulder

No unpaved shoulder

Medium road surface condition

No street lighting



# Karnataka (550km)

% rated 3-stars or better

	Existing network	Final design
Road user		
Vehicle occupants	14%	98%
Motorcyclists	6%	56%
Pedestrians	0%	88%
Bicyclists	0%	55%

Design Summary	Performance Target/Indicators	Data Sources/Reporting Mechanisms	Assumptions and Risks
<b>Impact:</b> Improved mobility of people and goods to contribute to the economic growth of the states connected by the Project corridor	<ul style="list-style-type: none"> <li>Average annual growth rates of passenger vehicles and goods vehicles in the Project corridor achieve 7% and 5% respectively from 2003 to 2015</li> <li>Direct contribution by road transport sector to Gross State Domestic Product increases by 1% by 2015 (cf. RJ: 3%, MP: 3%, UP: 4% in FY 2006 at current prices)</li> </ul>	<ul style="list-style-type: none"> <li>Post-implementation measurement</li> <li>State government's socioeconomic statistics</li> </ul>	<b>Assumptions:</b> <ul style="list-style-type: none"> <li>Delivery of the Project is timely.</li> <li>Economy remains stable.</li> <li>The market mechanism functions well.</li> </ul>
<b>Outcome:</b> Improved road transport services and safety along the Project corridor	<ul style="list-style-type: none"> <li>Travel time decreases (Average running speed increases) at completion of the Project roads - Car 80 kph (cf. 51.5 kph in 2002) - Truck 60 kph (cf. 40 kph in 2002)</li> <li>The number of traffic fatalities of the Project corridor in 2012 does not exceed pre-Project level (cf. 308 fatalities in 2001)</li> </ul>	<ul style="list-style-type: none"> <li>Post-implementation measurement</li> <li>State Government's data and statistics</li> </ul>	<b>Assumptions:</b> <ul style="list-style-type: none"> <li>Delivery of the Project is timely.</li> <li>Enforcement and education of road safety function over time.</li> </ul>
<b>Outputs:</b> 1. Stretches between Chittorgarh and Orai are widened	<ul style="list-style-type: none"> <li>595km completed by 2010</li> </ul>	<ul style="list-style-type: none"> <li>Progress reports</li> <li>ADB's loan review missions</li> </ul>	<b>Assumptions:</b> <ul style="list-style-type: none"> <li>The contactors perform satisfactorily without delaying the works</li> </ul>

**\$113 million per yr**  
Cost of deaths and serious injuries

**308 deaths per / 595 km**  
**= 0.52 deaths / km !**

*Ezra Hauer: "...is it better to be dead than stuck in traffic?"*

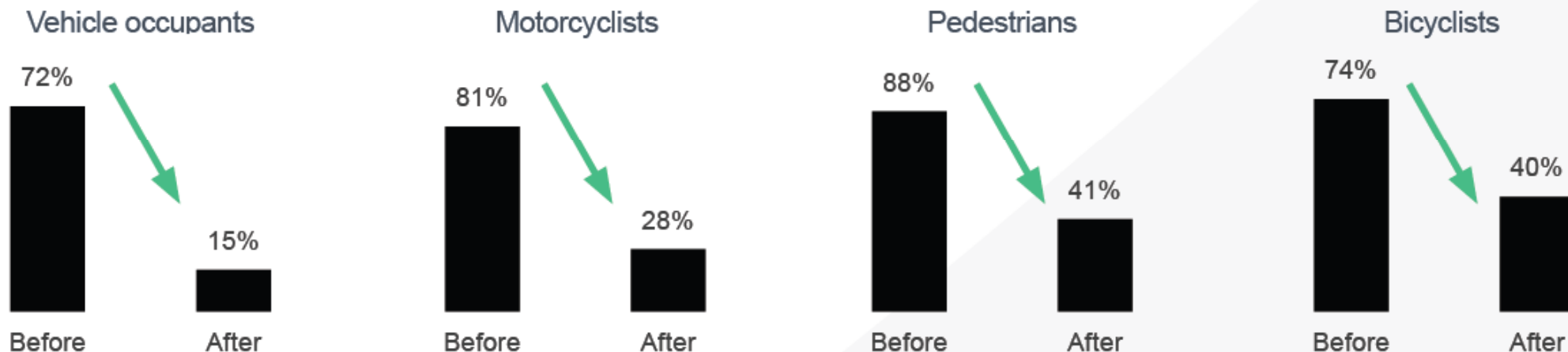
Cat.	Description	Lead time	Example countermeasure
A	Immediate implementation with maintenance programme	Now	<ul style="list-style-type: none"> <li>▪ Delineation</li> <li>▪ Road surface</li> <li>▪ Footpath</li> </ul>
B	Simple works that do not add capacity, can be funded in existing annual budgets	1 year	<ul style="list-style-type: none"> <li>▪ Shoulder sealing</li> <li>▪ Pedestrian crossing</li> <li>▪ Bicycle lane</li> </ul>
C	Works that require detailed design but do not add capacity, can be funded in existing annual budgets	2-5 years	<ul style="list-style-type: none"> <li>▪ Intersections</li> <li>▪ Realignment</li> </ul>
D	Countermeasures that require major new works and would result in an increase in capacity of the road and require new budget	5-10 years	<ul style="list-style-type: none"> <li>▪ Duplication</li> <li>▪ Grade separation</li> </ul>

# Investments on 6,500km in India

- If all economically-viable countermeasures implemented:

– Cut deaths and serious injuries by **55%**

Change in road length rated 1- and 2-stars if all countermeasures are implemented





# <http://toolkit.irap.org>

ROAD SAFETY  
TOOLKIT

Crash Types

Road Users

Treatments

Management

About

English



Treatments > **Roadside Safety - Barriers**

Search...



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Safety barriers are used to stop 'out of control' vehicles from:

- leaving the road and hitting roadside hazards, including slopes (roadside barriers)
- crossing into the path of on-coming vehicles (see [median barriers](#)).

They are designed to redirect the vehicle and have a lower severity than the roadside hazard they protect. There are three main types of safety barrier (but within these types there are different systems which have their own specific performance characteristics).

**Flexible barriers** are made from wire rope supported between frangible posts. Flexible barriers may be the best option for minimizing injuries to vehicle occupants, however they may pose a risk to motorcyclists. These barriers deflect more than other barrier types and need to be repaired following impact to maintain their re-directive capability.

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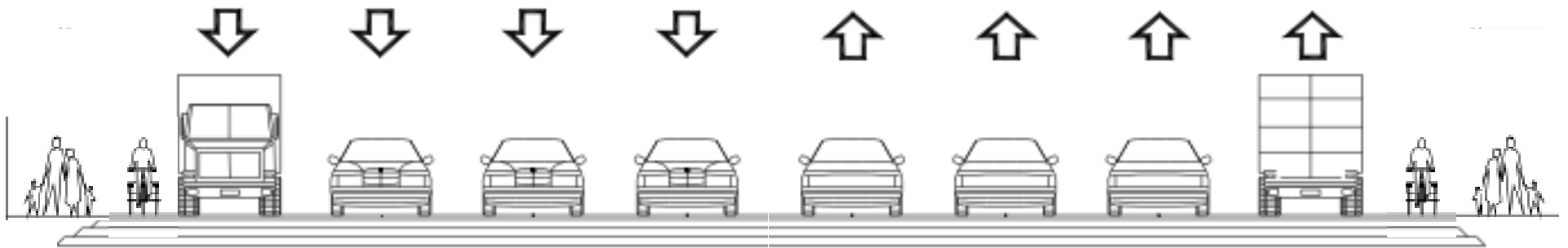
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Related Images



# Star Rating Designs



**Speed = 70km/h**

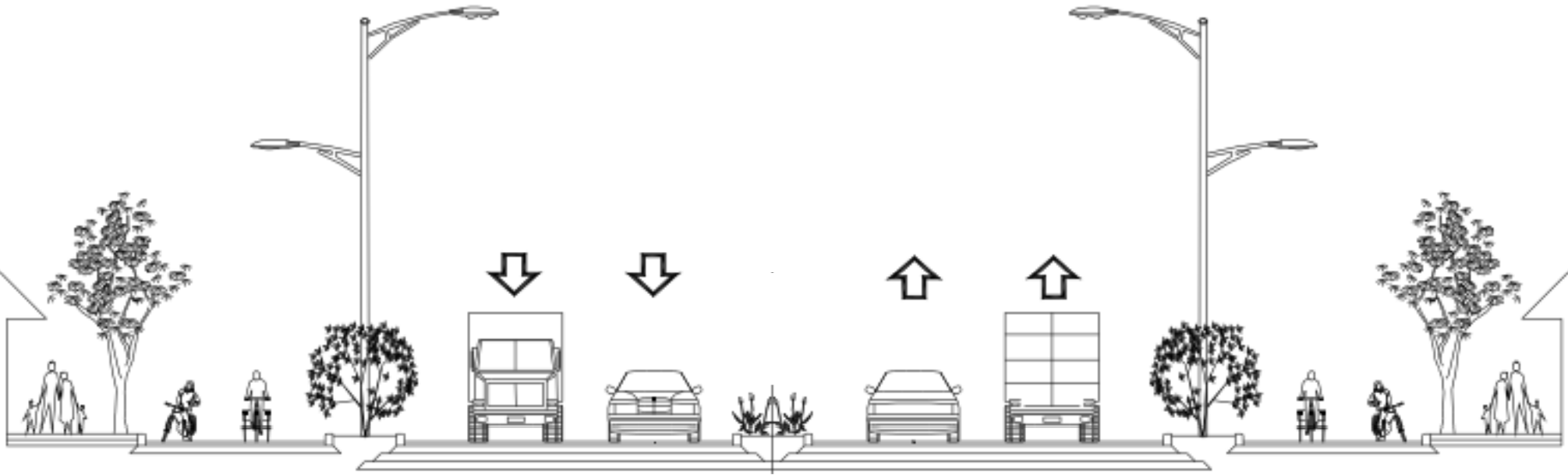
**Vehicle occupants:**

**Motorcyclists:**

**Non-motorised (bicycles):**

**Pedestrians:**

# Star Rating Designs



Speed = 50km/h

Vehicle occupants:

Motorcyclists:

Non-motorised (bicycles):

Pedestrians:

# Recommendation

New and upgraded roads achieve at least 3-stars for vehicle occupants, motorcyclists, bicycles and pedestrians



## Programme donors



Managed by the  
World Health  
Organisation



## Project partners



## Centres of Excellence



Midwest  
Research  
Institute

## Self-governing programmes



A World Free of High Risk Roads



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