



O IMPACTO ECONÓMICO E SOCIAL DA SINISTRALIDADE RODOVIÁRIA EM PORTUGAL

The Economic and Social Impact of Road Crashes in Portugal

Conferência | *Conference*

16 março 16th March 2022 | **STREAMING**



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The Economic and Social Impact
of Road Crashes
in Portugal



The Business Case for Safer Roads & Results-based financing to save lives

ROB MCINERNEY

CEO iRAP

16 March 2022



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International Road Assessment Programme



Rob McInerney

CEO



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Global charity - Local leadership



100+ countries



3,000,000+ km



us\$80bn+
investment made safer





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The Human and Financial Impact of Road Trauma



<https://www.vaccinesforroads.org/global-impact-of-injuries/>

The Human Impact of Road Injuries every day

NEW VICTIMS EVERY DAY	HUMAN IMPACT	NEW COSTS EVERY DAY
3,626	Lives Lost	\$ 1.7 billion
932	Severe Acquired Brain Injury	\$ 1.3 billion
20,865	Fractures - Limb	\$ 789 million
9,090	Internal Injuries	\$ 575 million
6,672	Brain Injury (Mild) / Head Injury	\$ 465 million
17,327	Soft Tissue (Neck / Back) / Whiplash	\$ 263 million
56	Quadriplegia	\$ 200 million
5,800	Fractures - Other	\$ 186 million
18,270	Contusion / Abrasion Laceration	\$ 110 million
2,865	Dislocations	\$ 103 million
920	Other Spinal	\$ 92 million
75	Paraplegia	\$ 76 million
914	Degloving	\$ 59 million
8,486	Other Injuries	\$ 55 million
4,266	Sprains / Strains	\$ 38 million
2,293	Concussion	\$ 24 million
161	Amputations	\$ 15 million
176	Burns (Severe / Moderate)	\$ 6 million
33	Nerve Damage	\$ 1 million
9	Lost Of Sight / Eyes	\$ 257,000
102,836	TOTAL	\$ 6.1 billion





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SUSTAINABLE
DEVELOPMENT GOALS


We have the Vaccines for Roads



GLOBAL ROAD SAFETY PERFORMANCE TARGETS



TARGET 1
2020



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

TARGET 2
2030



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

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.

TARGET 5
2030




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
2030



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
2030



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

TARGET 8
2030



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
2030



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
2030



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

TARGET 11
2030

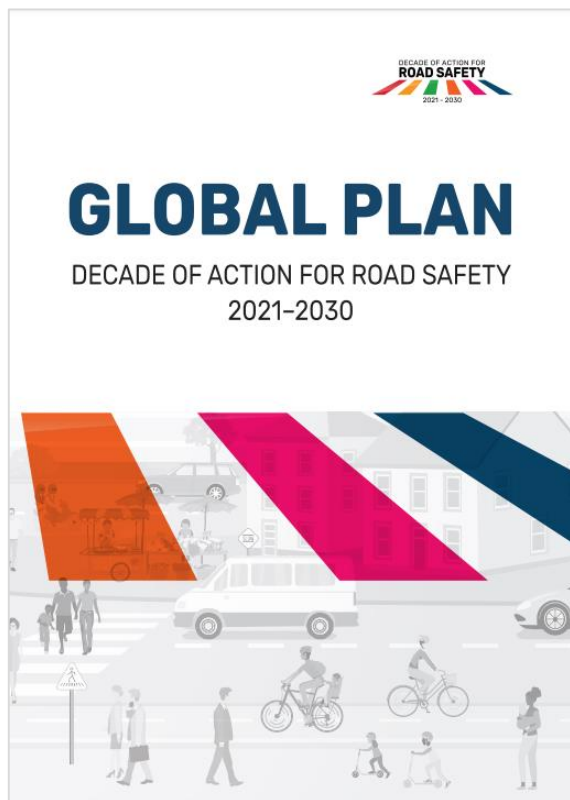


Target 11: By 2030, all countries to enact regulation for driving time and rest periods for professional drivers, and/or accede to international/regional regulation in this area.

TARGET 12
2030



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.





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There is a market failure in our investment in road safety



Who Pays



The Health Sector
Crashes consume 75% of hospital capacity for treating head injuries



Business & Families
Caring for a loved one
Death or injury of a worker

Insurance
Insurance premiums and payouts account for 1% of GDP



Long Term Care
Life changing injury can require 70 years of care



BILL OF
POOR ROAD
SAFETY

What can be fixed?



The Road User
Speed, Alcohol, Distraction, Fatigue, Helmets, Seat Belts



The Vehicle
World car fleet will double in next 10-20 years. Zero-star cars are still being sold

SOLUTIONS
FOR ROAD
SAFETY

The Road

> 40% of roads are only 1 or 2-star standard.
High return-on-investment solutions exist





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LET'S WORK BACKWARDS!



INVOICE

BILL TO

Portugal Population

- Government
- Health Systems
- Insurance
- Business
- Families

INVOICE

1

DATE

10 March 2022



DESCRIPTION

Road death and injury
2021-2030

AMOUNT

€34.7
billion+



Between now and 2030 in Portugal:

- How many people will die?
- How many will suffer brain injuries?
- How many will have limb fractures?
- How many will suffer spinal injuries?



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The Business Case for Safer Roads in Portugal



61% of travel
3-star or better



INVEST
€100m

SAVE
4,405
people

SAVE
€766m

Filter 1 - EuroRAP > Portugal > ANSR 2018 > 1a Vaga

Safer Roads Investment Plan

Currency: € EUR - Analysis Period: 20 years

Total FSIs Saved	Total PV of Safety Benefits	Estimated Cost	Cost per FSI saved	Program BCR
4,405	766,004,467	100,465,611	22,810	BCR: 8 to 1

Countermeasure	Length / Sites	FSIs saved	PV of safety benefit	Estimated Cost	Cost per FSI saved	Program BCR
Additional lane (2 + 1 road with barrier)	6.80 km	23	3,947,147	958,500	42,205	4
Central hatching	514.20 km	117	20,288,274	4,124,661	35,366	5
Central median barrier (1+1)	1.50 km	5	844,672	228,000	46,955	4
Central median barrier (no duplication)	86.00 km	374	65,082,994	6,745,068	18,013	10
Centreline rumble strip / flexi-post	4.60 km	1	192,217	63,935	57,810	3
Duplicate - <1m median	1.20 km	1	257,767	83,077	56,357	3
Duplication with median barrier	593.20 km	2,336	406,297,006	46,863,760	20,061	9

ANSR
AUTORIDADE NACIONAL
SEGURANÇA RODOVIÁRIA

Infraestruturas
de Portugal



87% of travel
3-star or better





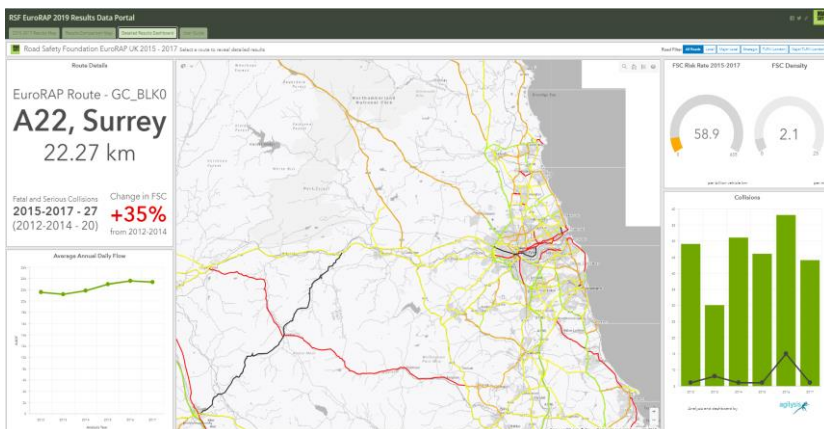
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The iRAP Global Standard



Global Risk Mapping

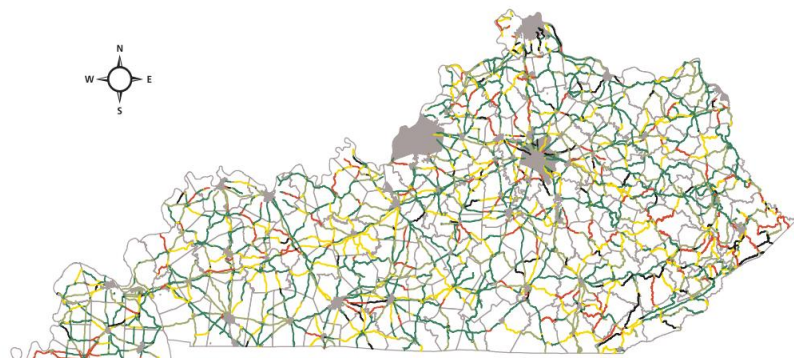


[EuroRAP Risk Mapping Results UK](#)

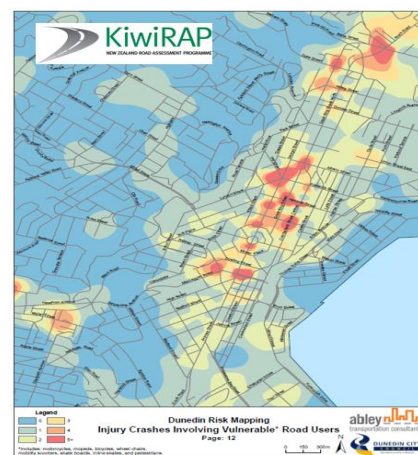


[AusRAP National Highways](#)

MAP 3. Crash Rate Ratio
(Crash Rate Compared to Average for Similar Road Types)

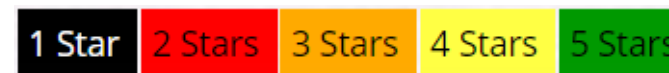
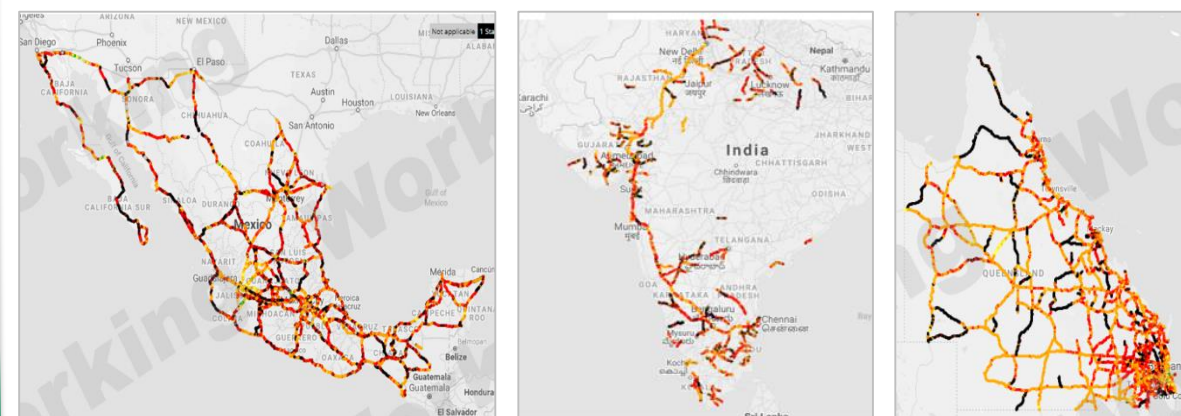


[usRAP Crash Rate Ratio](#)



[KiwiRAP Risk Maps](#)

Global Star Rating



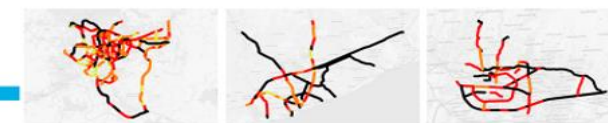
How does my city compare to others?

Pedestrian Star Ratings (before changes were made)

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



Ho Chi Minh City



Addis Ababa

Accra

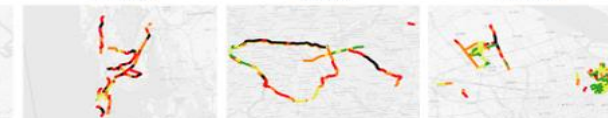
Bandung



Bangkok

Bogota

Fortaleza



Mumbai

Sao Paulo

Shanghai



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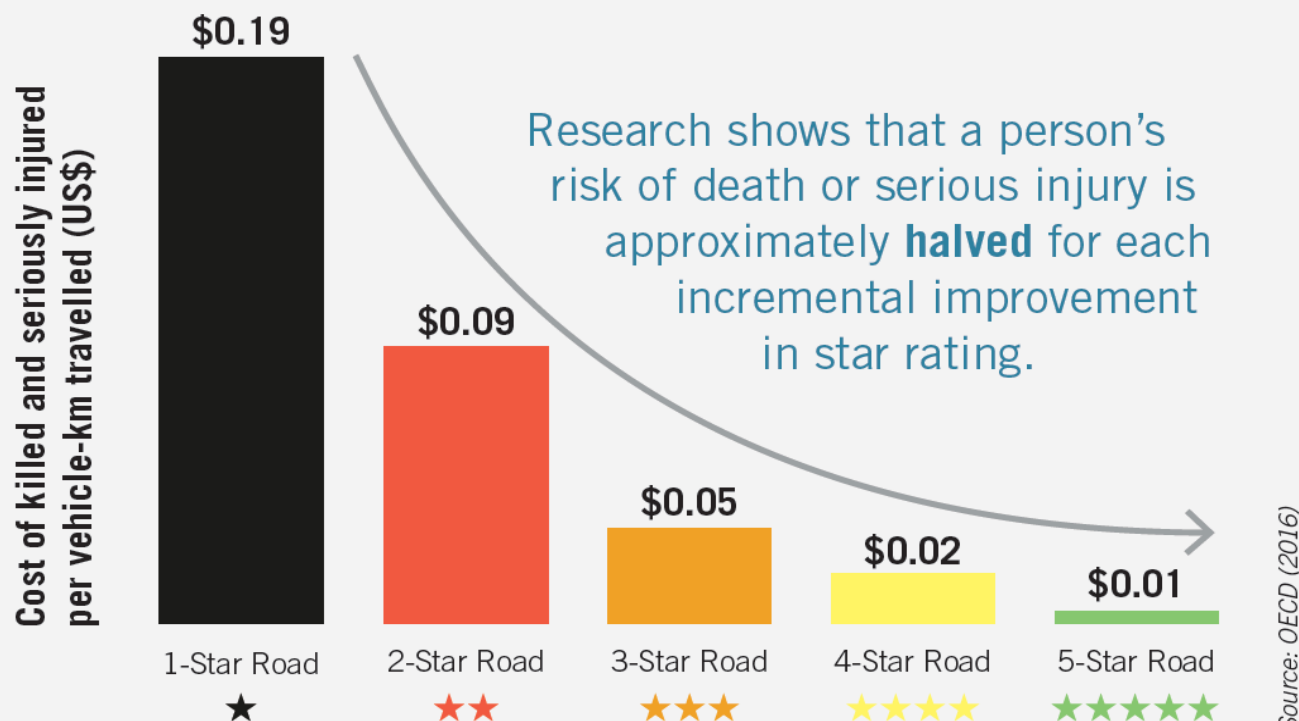
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The Global Opportunity to Save Lives and Save Money



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

Evidence-based Impact



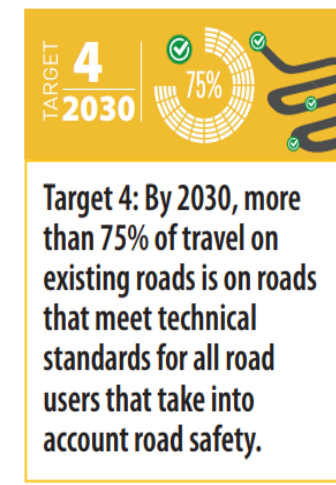
<https://www.oecd-ilibrary.org/transport/zero-road-deaths-and-serious-injuries>

Business Case for Safer Roads

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





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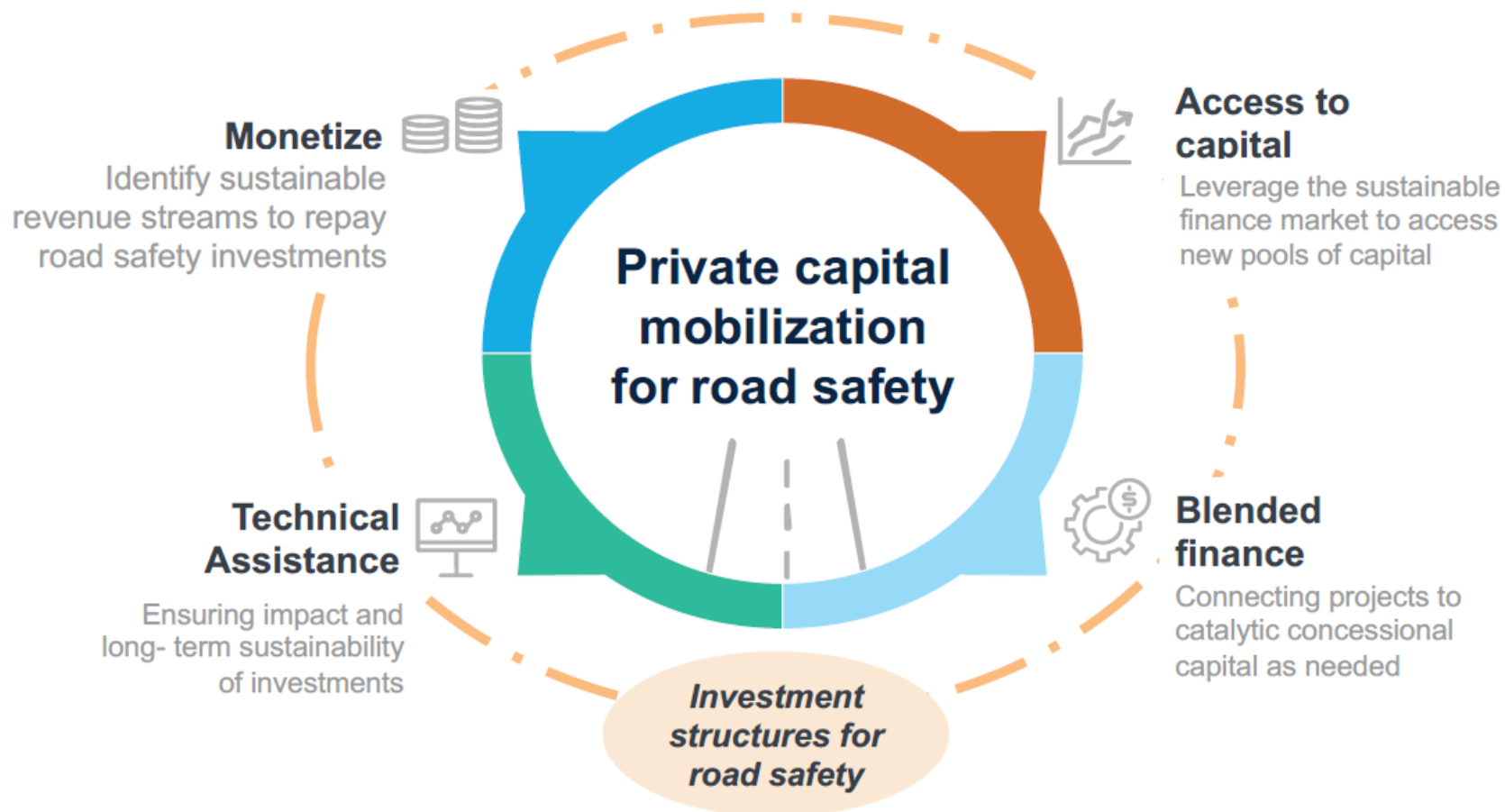
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SAVING LIVES THROUGH PRIVATE INVESTMENT IN ROAD SAFETY

Knowledge Report – 2022



Impact Investment and Private-Sector Financing



<https://blogs.worldbank.org/ppps/private-investment-road-safety-can-save-lives>



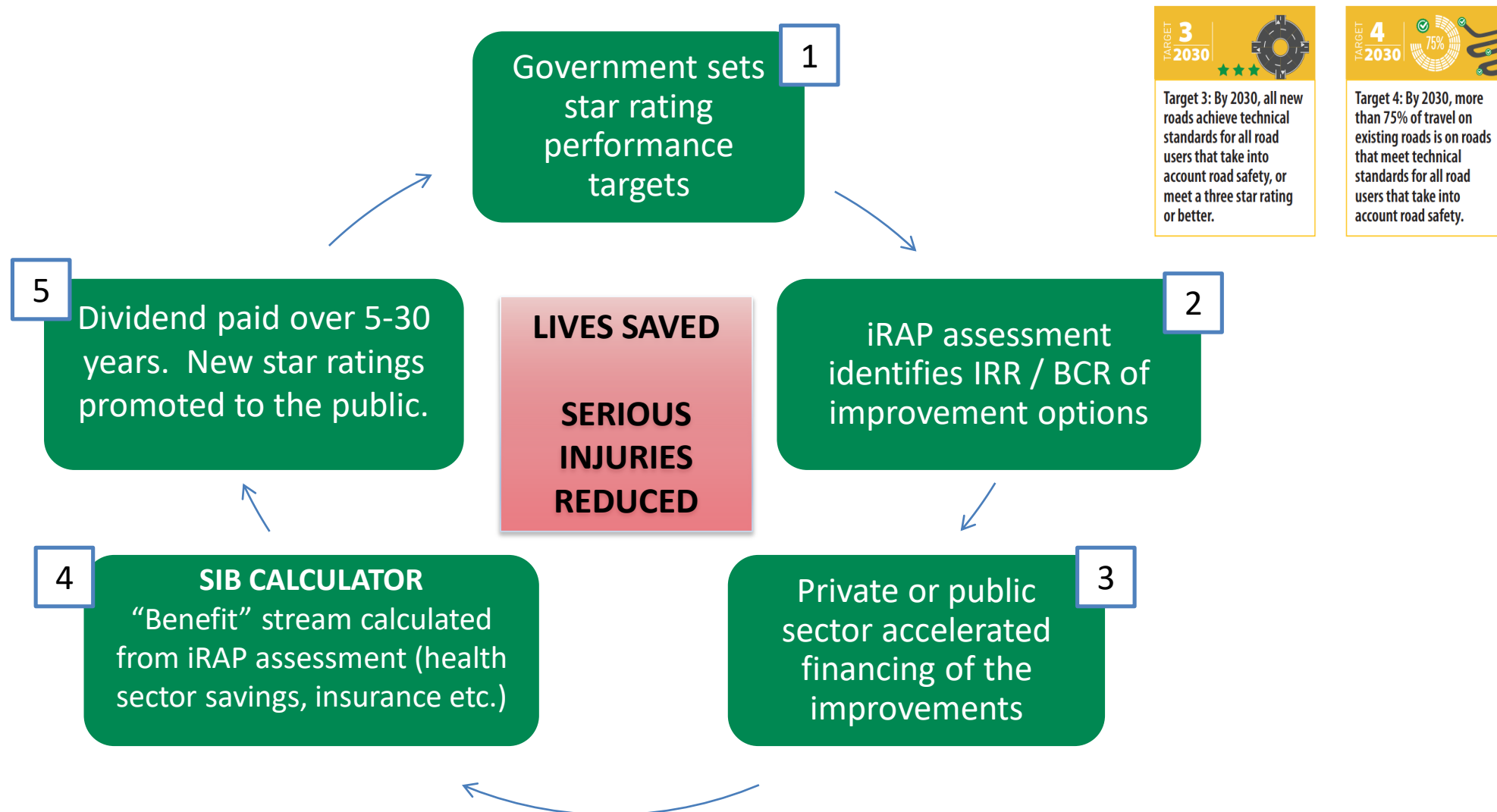
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SUSTAINABLE
DEVELOPMENT
GOALS

Results-based financing



3 GOOD HEALTH
AND WELL-BEING



11 SUSTAINABLE CITIES
AND COMMUNITIES





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Brazil 3-star or better Concessions



BrazilRAP
BRAZILIAN ROAD ASSESSMENT PROGRAM

More than 4,000 km

More than 100,000
FSIs saved

48% of travel on
5-star roads





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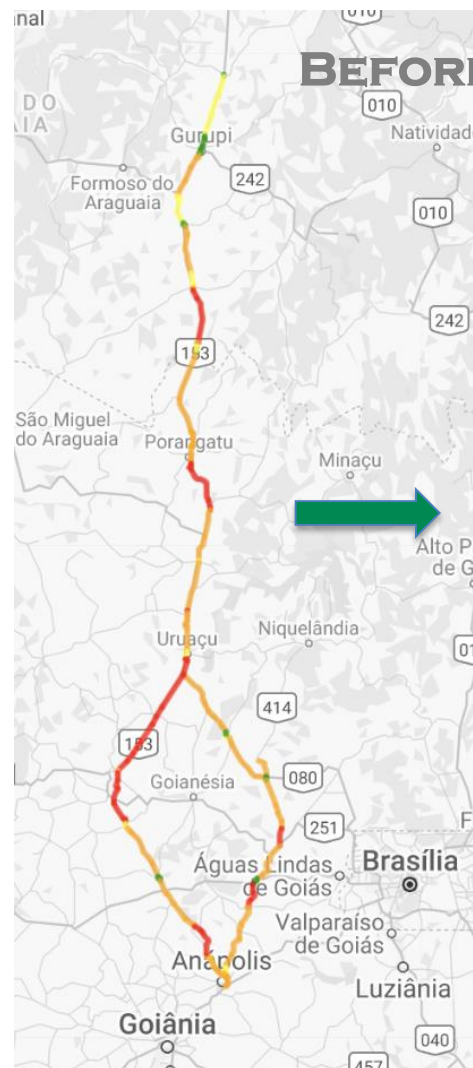
Star Ratings and investments modelled over 30 years



Nova Dutra Network



Trecho	ANO 0	ANO 5	ANO 10
TH-04	2	2	4
TH-05	2	2	4
TH-06	2	2	4
TH-07	2	3	3
TH-08	2	2	3
TH-09	3	3	3
TH-10	3	3	4
TH-12	2	2	3
TH-13	3	3	3
TH-18	3	3	4
TH-19	3	3	4
TH-20	3	3	4
TH-21	2	2	3
TH-22	5	5	5
TH-23	5	5	5
TH-24	3	3	4



BEFORE

BR-153 network



Duplication

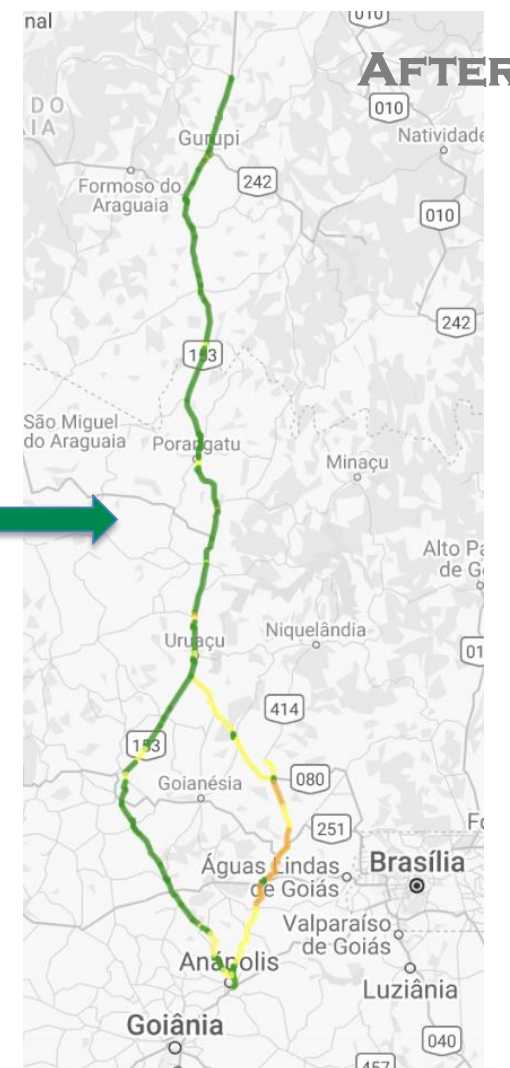
Additional lane
(2 + 1 road with barrier)

Roadside barriers

Shoulder rumble strips

Intersection upgrades

Delineation & Signing



AFTER



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PIRACICABA-PANORAMA ("PIPA") HIGHLIGHTS



AUTHORITY



ADVISORS



TECHNICAL



INVESTORS



PATRIA

CONCESSIONAIRE



- \$3.4bn including \$2.5bn CAPEX and \$0.28bn upfront concession fee to Sao Paulo State Government
- ARTESP monitors progress – toll collections only permitted after first performance milestone has been met
- Advisory team support for financing, design of bonus scheme, star rating targets + independent monitoring and reporting

3-star or better targets

User	Y0	Y10	Y30
Vehicle	77%	96%	...
Pedestrian	64%	77%	...
Motorcyclists	61%	75%	...
Bicyclists	67%	82%	...

Bonus Tiers

Achieved	Bonus
110%-120%	0.5% of contribution
121%-130%	1.0% of contribution
131%-140%	1.7% of contribution
140%+	2.7% of contribution

Concessionaires in Sao Paulo are required to contribute a % of toll revenues to the Sao Paulo monetary fund. If performance exceeds targets, they receive a % payback of that contribution.



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3-star or better major highways



- PPPs to deliver a 3-star or better standard by 2030 or similar
- Shadow toll / availability payment funded through savings to government, insurance and/or health system
- Link concession period extensions to “higher-performing star rating outcomes” (e.g. 4 and 5-star)



Example of a vehicle occupant 5-star road section (Spain)





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SUSTAINABLE
DEVELOPMENT
GOALS

Redesign IRAP Star Rating

Street Only



The Intersection



Redesign | 16 m | 20 km/h

3-star or better city streets & schools



V-B
Conflicts with vehicles

0.00



B-B
Conflicts between bicycles
and/or light mobility
vehicles

12.38



B-P
Conflicts with pedestrians

12.38



SB
Crashes which do not
involve others

24.76

CycleRAP Score

49.51

Extreme risk

<https://globaldesigningcities.org/2020/09/29/star-rating-your-street-plans-with-irap-and-the-global-street-design-guide/>

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



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The Portugal Opportunity



Achieving >75% of travel in Portugal
on 3-star or better roads will save...

35,000+ deaths & serious injuries

over the life-time of the treatments
with a return on investment of...


€3 for every \$1 invested

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.



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Partnerships for 2030 Impact




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**HALVING ROAD DEATHS & INJURIES
TOGETHER BY 2030**

<https://irap.org/>

<http://eurorap.org/>



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OBRIGADO | THANK YOU