



17TH ROAD SAFETY CONFERENCE



11 mar 2025



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A35 Brebemi
ALEATICA
Smart & Sustainable Infrastructure



ROAD INFRASTRUCTURE ASSESSMENT OF A35/A35VAR MOTORWAY: BRESCIA-BERGAMO-MILAN

Presented by **Ing. Giuseppe MASTROVITI**
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&
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Engineer at EIRA-EuroRAP

cascajPortugal 1marc2025



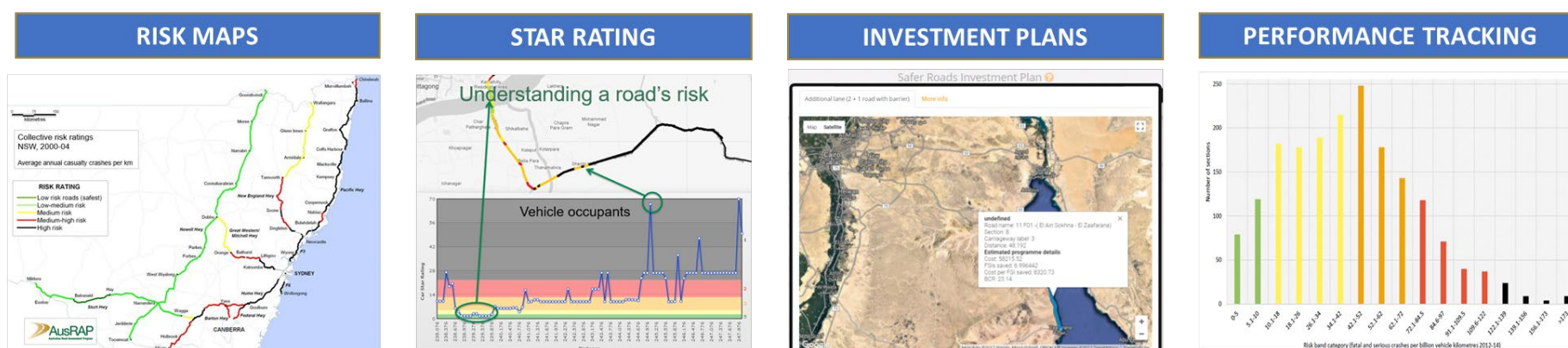
About *i*RAP

iRAP (International Road Assessment Programme) is a global charity dedicated to improving road safety.

Works with governments, road authorities, and NGOs to assess high-risk roads.

Uses a Star Rating methodology to evaluate road infrastructure safety.

Core methodologies and protocols



PARTNERSHIPS FOR 2030 IMPACT

A WORLD FREE OF HIGH-RISK ROADS – PROGRESS BY DECEMBER 2023



iRAP partners with governments, mobility clubs, funding agencies, development banks, industry, research institutes and NGOs around the world to make roads safer



iRAP Star Rating Methodology

Evaluates road safety based on infrastructure design and risk levels.

Ratings range from 1 star (high risk) to 5 stars (low risk).

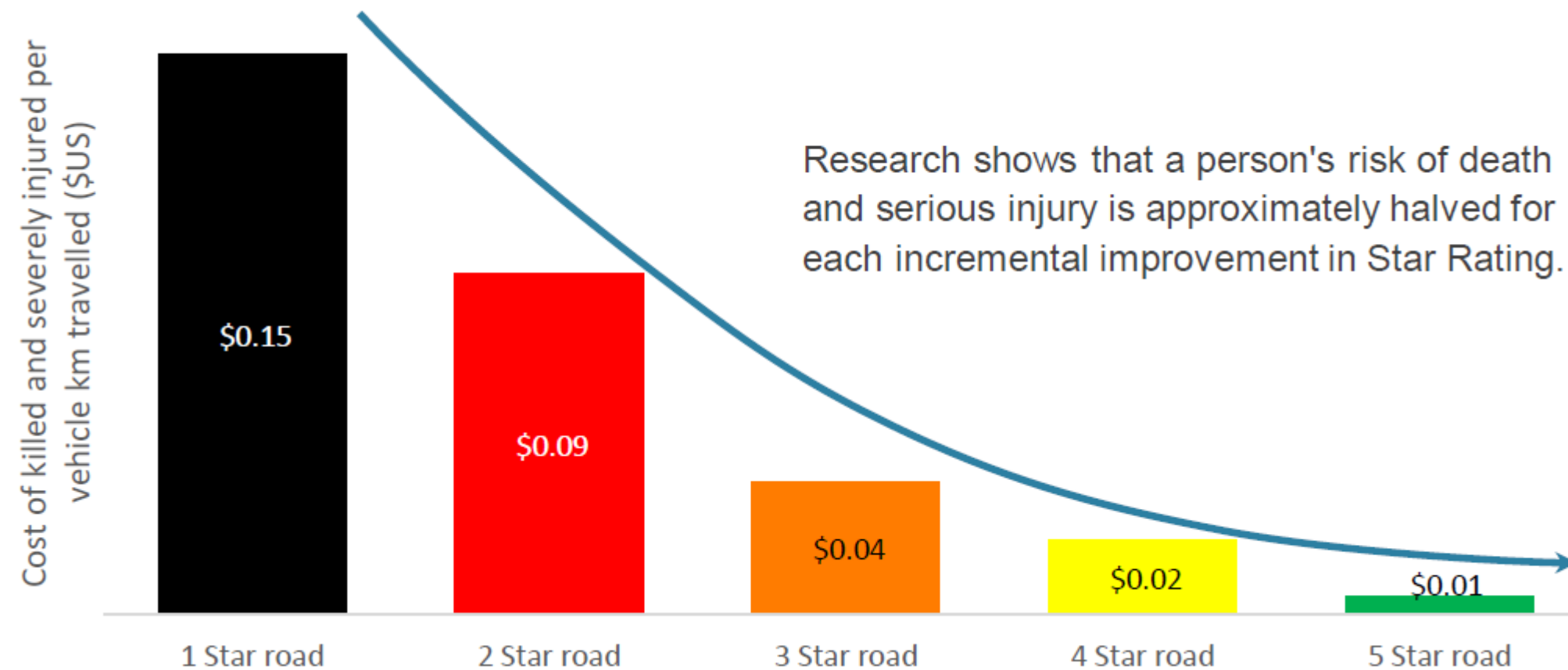
Factors analyzed: roadside environment, median separation, intersections, speed limits.



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: 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.

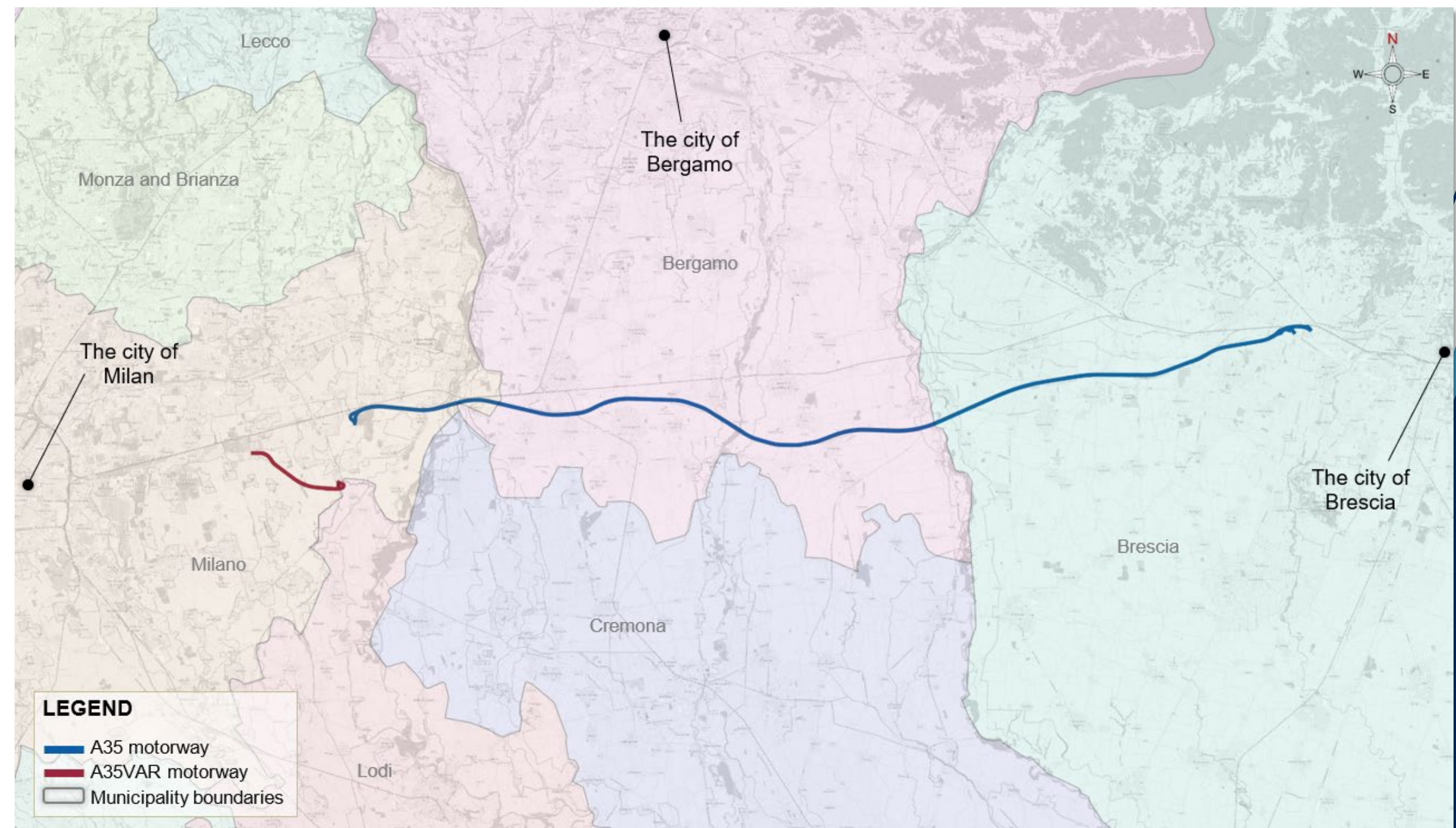


iRAP ASSESSMENT OF A35 MOTORWAY: BRESCIA-BERGAMO-MILAN (BreBeMi)

Assess the safety condition of the A35 and the A35 VAR BreBeMi motorway.

Identify high-risk locations and opportunities for safety improvements.

Develop recommendations for road infrastructure enhancements.



Overview – crash & AADT data

Data covers accidents on A35 & A35VAR motorways (Jan 1, 2017 – Jun 30, 2023)

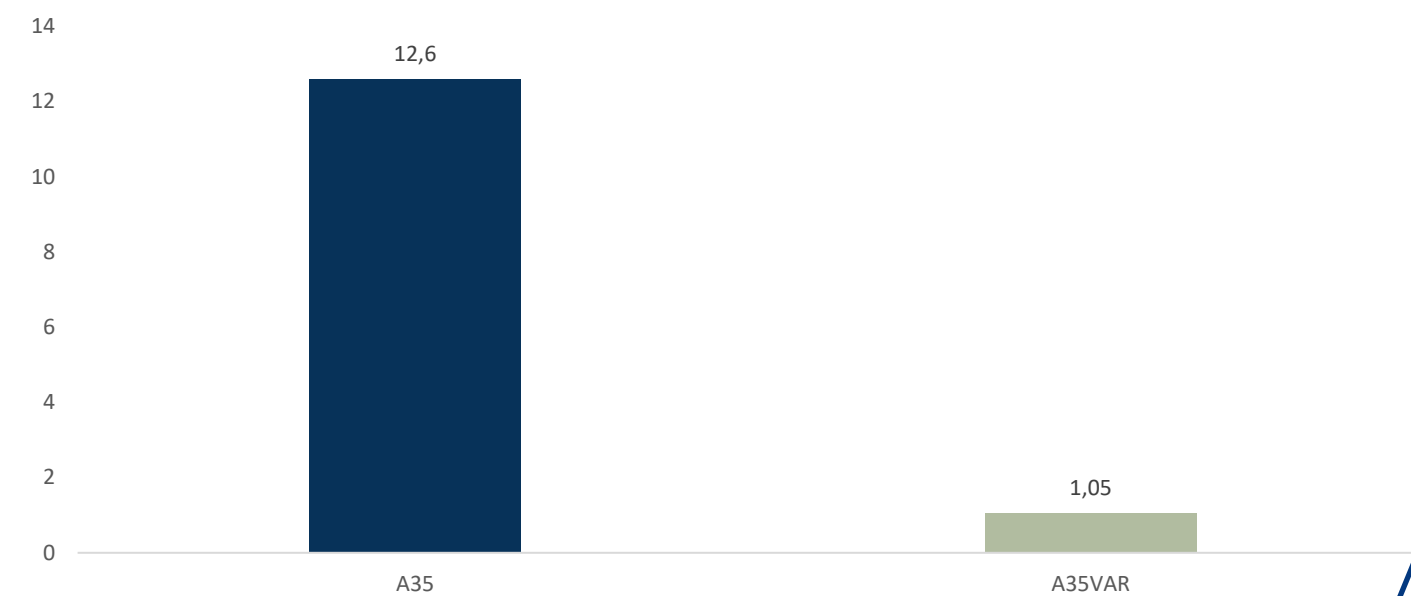
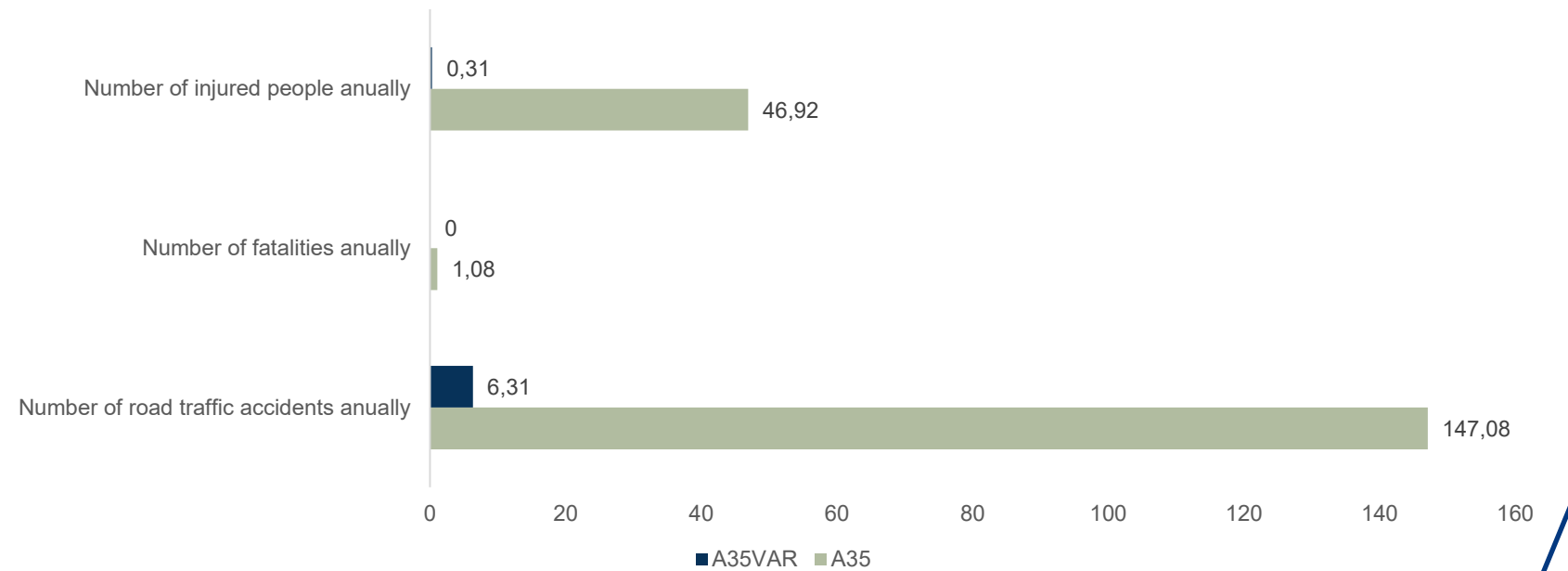
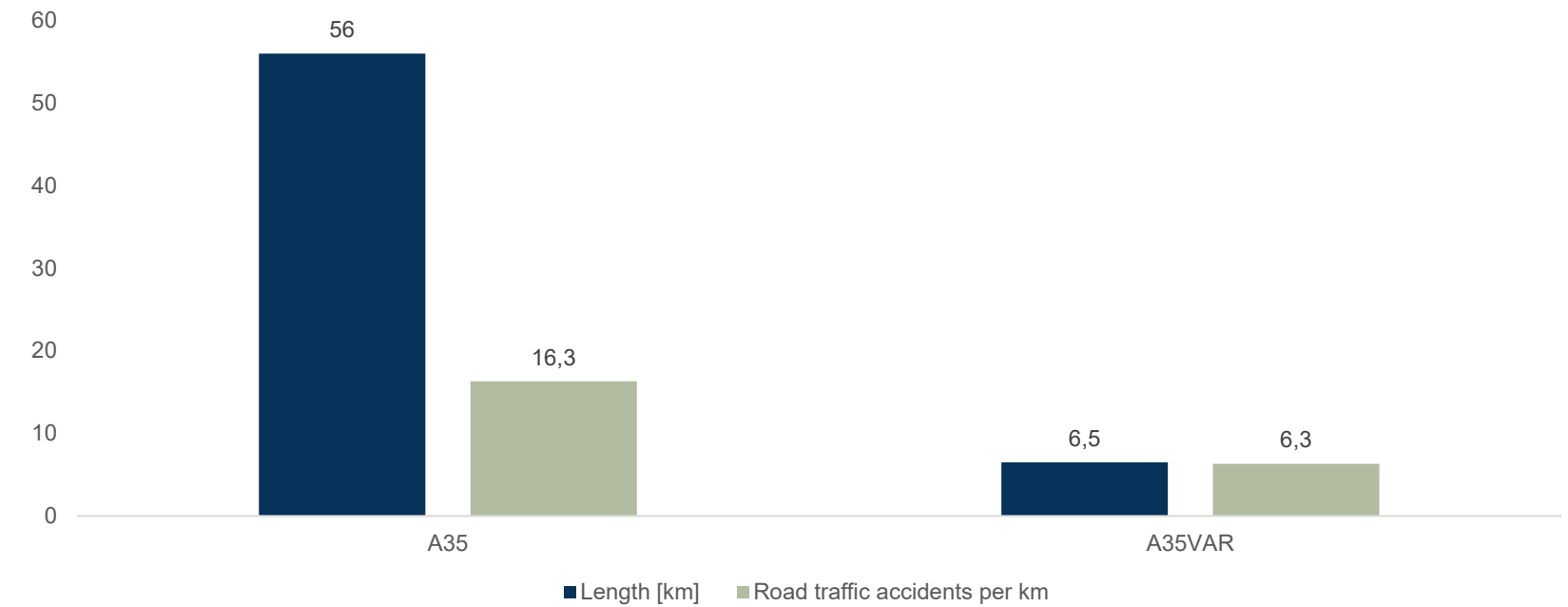
Total accidents: 956 over 78 months

- A35: 915 accidents (96%)
- A35VAR: 41 accidents (4%)

Accident density per km:

- A35 (56 km): 16.3 accidents/km
- A35VAR (6.5 km): 6.3 accidents/km

Most common accident types: rear-end collisions, guardrail impacts, random obstacles.

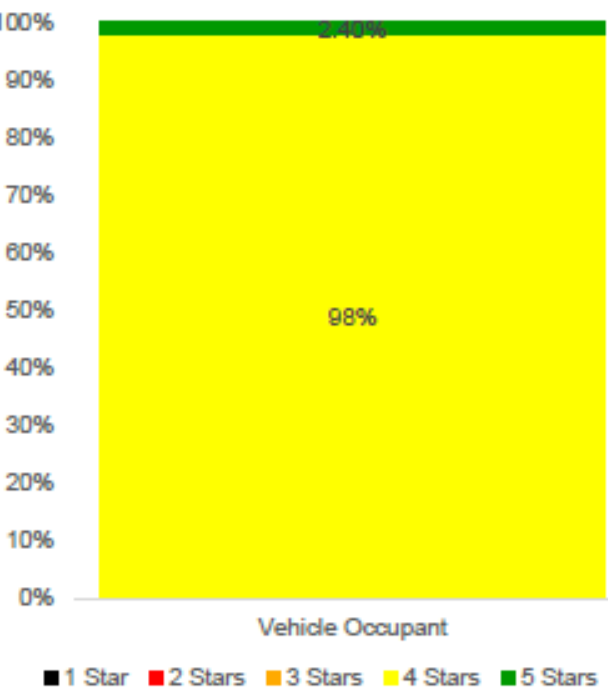


Star Rating Results - *A35 and A35VAR BreBeMi*

Raw Star Rating for Vehicle Occupants:

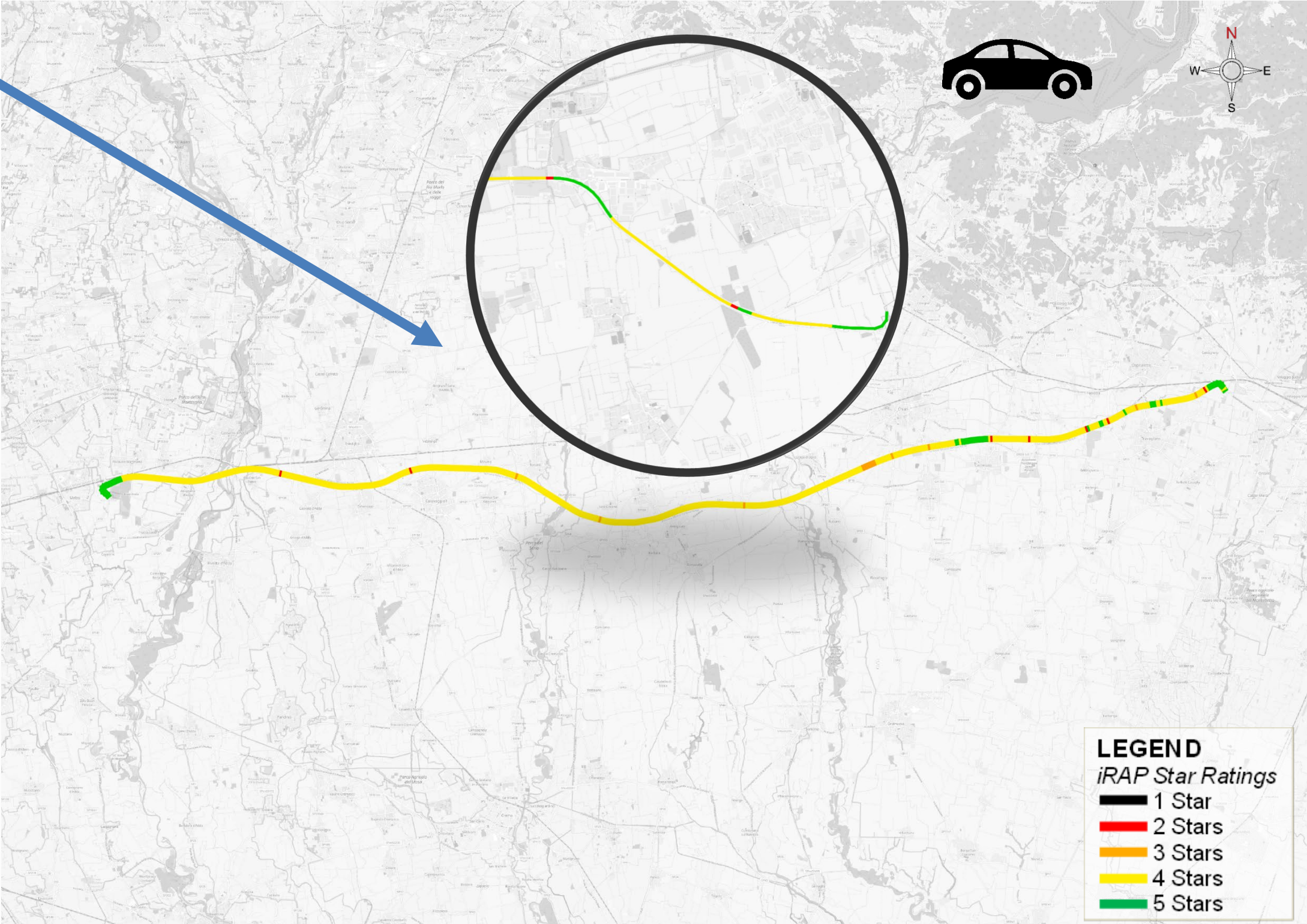
- 5 Stars: 11.0% of road sections.
- 4 Stars: 86% of road sections.
- 2 & 3 Stars: only around 3.2%.
- 1 star – 0 km !

Achieved a 4-star rating, exceeding iRAP's 3-star safety goal. (smoothed sections)



Star Ratings	Vehicle Occupant	
	Length [km]	Percent
5 Stars	3	2.00%
4 Stars	121.7	98.00%
3 Stars	0	0.00%
2 Stars	0	0.00%
1 Star	0	0.00%
Not applicable	0	0.00%
Totals	124.7	100.00%

Raw (100 m) Star Rating Map - vehicle occupant, A35 and A35VAR BreBeMi motorway (westbound)



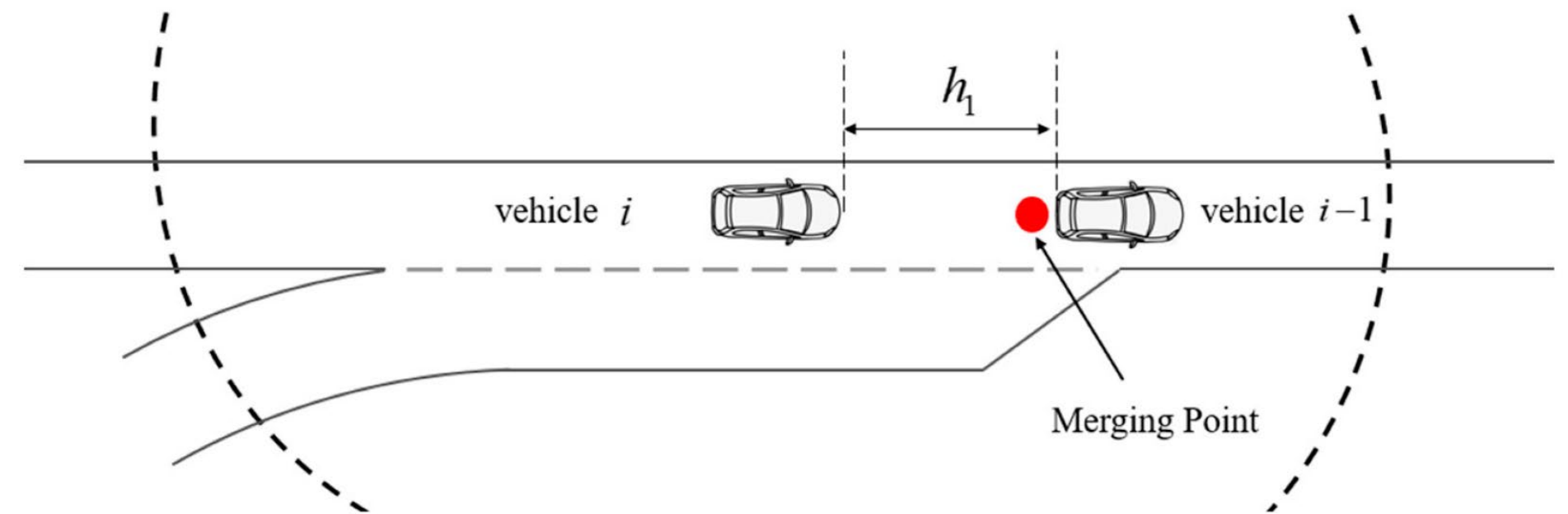
Identified High-Risk Segments

Critical Locations: Merge lanes and junctions with high accident rates.

Speed Influence: Reducing speeds could increase Star Ratings.

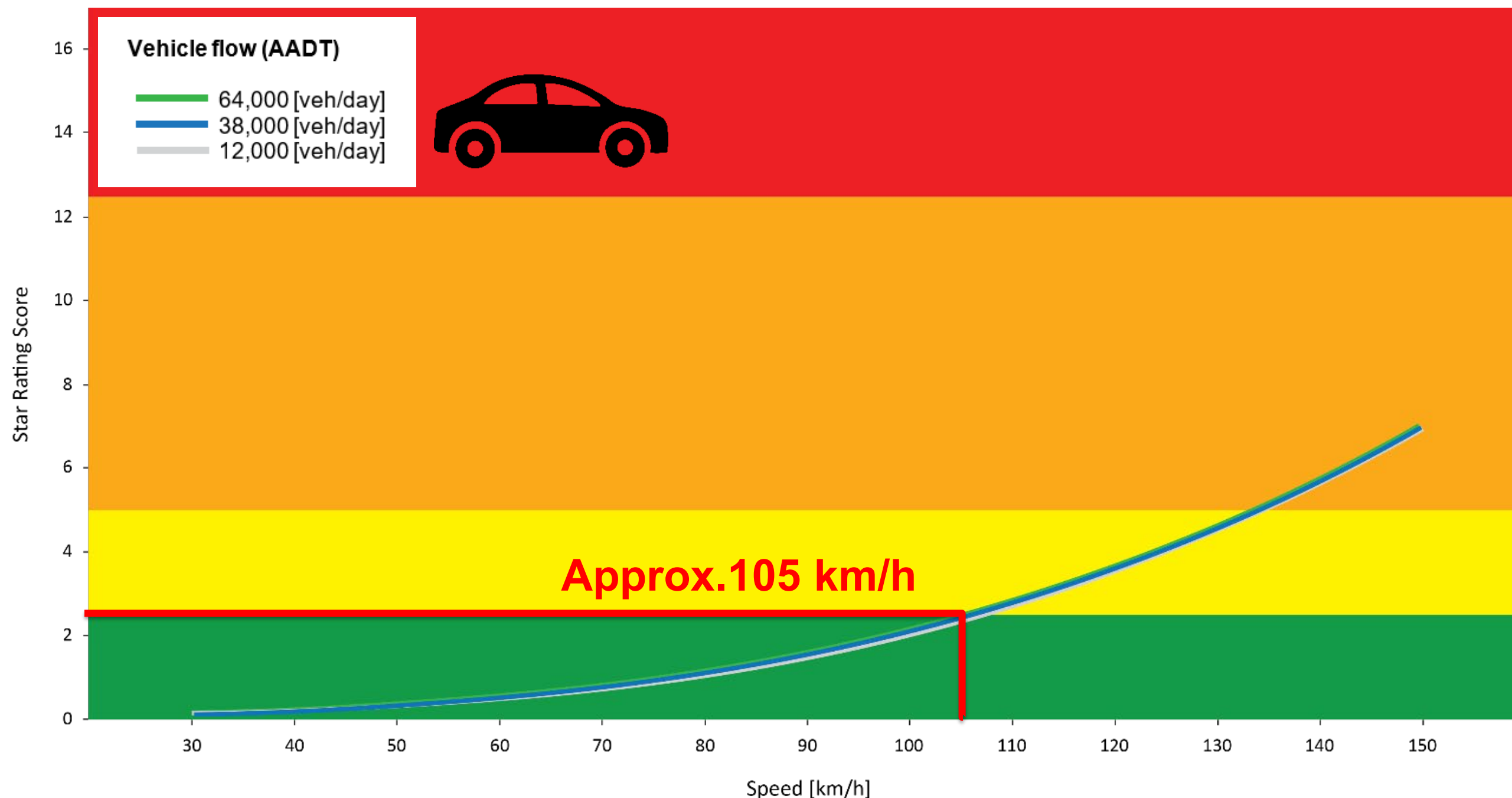
Example: A35 (westbound) km 1.20 - low Star Rating due to a merge lane.

<https://doi.org/10.3390/su141811120>



Posted speed limit – Methodology limitations

Following chart presents the effect of AADT and speed on Star rating results. Considering the two parameters, motorways with posted speed limit above 100 km/h may not be awarded with a rating higher than 4 stars, which is a limitation of the methodology itself.



Recommended Safety Interventions

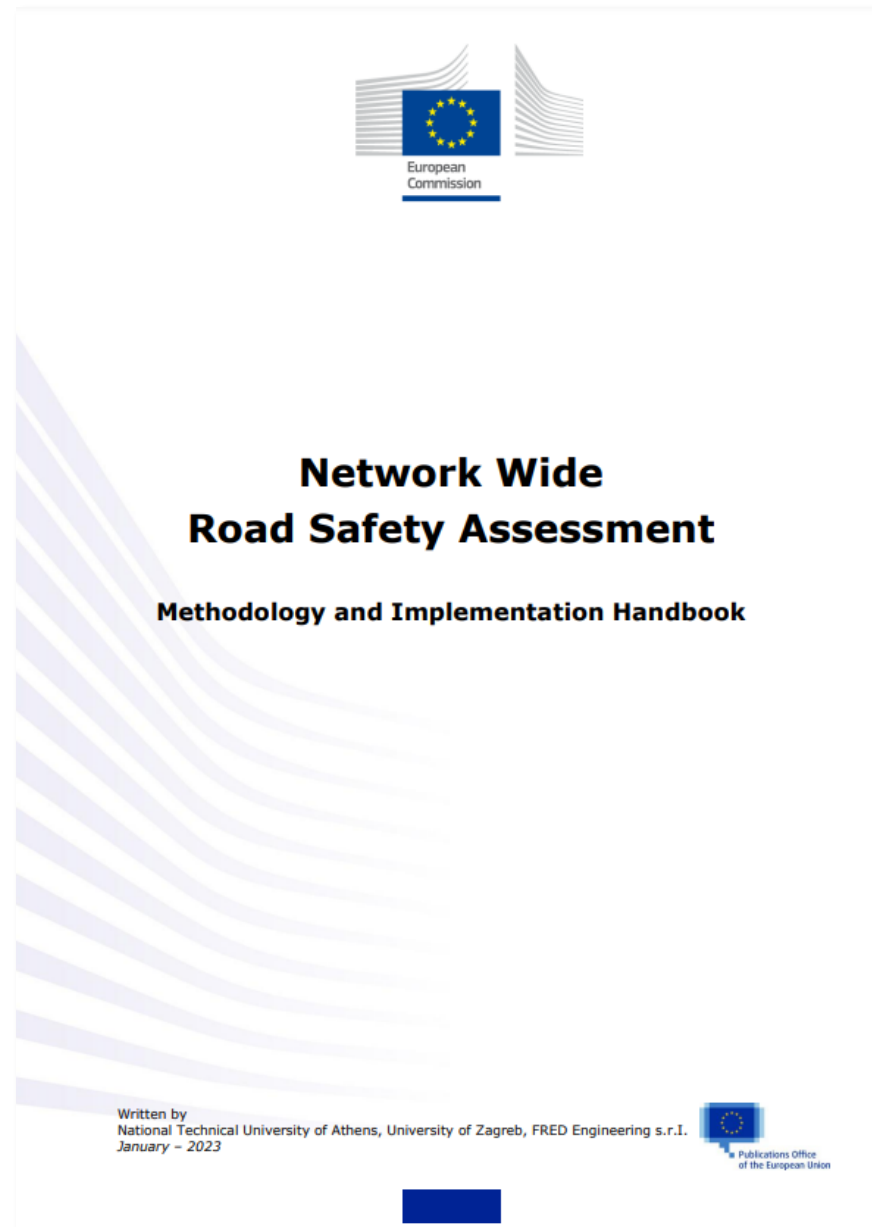
Shoulder Rumble Strips: Alert drivers when veering off lanes.

Speed Monitoring Systems: Reduce speed variations and violations.

Crash Cushions at Toll Stations: Minimize crash severity at concrete barriers.



About the NWA Network Wide Road Safety Assessment Methodology



- **Study** on a Methodology for Network-wide Road Safety Assessment
- Developed under **NetSafety project** for European Commission*
- Research study with the aim to **assist EU member states** in developing a methodology for a common network-wide road safety assessment and a safety rating system **in accordance** with the 2019 RISM Directive



National Technical University of Athens (NTUA)



University of Zagreb, Faculty of Transport and Traffic Sciences (FPZ)



FRED Engineering s.r.l. (FRED)

About NWA: https://road-safety.transport.ec.europa.eu/eu-road-safety-policy/priorities/infrastructure/road-infrastructure-guidelines_en
Handbook: <https://road-safety.transport.ec.europa.eu/system/files/2023-01/NWA-Handbook7.pdf>

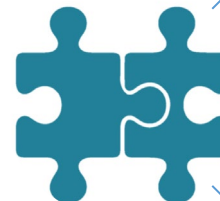
Network-Wide Assessment (NWA)



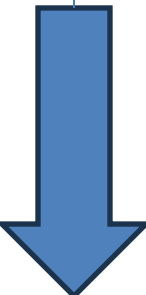
Reactive component



Proactive component



Integration of methodology results



PROACTIVE ASSESSMENT RESULTS

High Risk (class p3)
Intermediate Risk (class p2)
LowRisk (class p1)

REACTIVE ASSESSMENT RESULTS

High Risk (class r3)	Unsure (class r2)	No Data	LowRisk (class r1)
Very High Priority (class 5)	High Priority (class 4)	High Priority (class 4)	LowPriority (class 2)
Very High Priority (class 5)	Intermediate Priority (class 3)	Intermediate Priority (class 3)	LowPriority (class 2)
Very High Priority (class 5)	LowPriority (class 2)	Very Low Priority (class 1)	Very Low Priority (class 1)



Network-Wide Assessment (NWA)

EU Directive 2019/1936 requires safety assessments of major roads.

EU NWA reactive and proactive methodologies applied to A35 and A35VAR.

Road segmentation into 500m sections for risk ranking.

	A35	A35VAR
Total km of roads	48	6
Total number of accidents	135	1
Average AADT	15.000	7.183
Total km of road junctions	8	5
Total number of accidents on junctions	62	1
Average AADT on junctions	15.000	7.183

OVERALL CLASSIFICATION OF ROAD SEGMENTS		
Length - direction W-E (km):	61.85	
Length - direction E-W (km):	61.61	
Total Length (km):	123.45	
Length - Class 1 (km):	6.39	5%
Length - Class 2 (km):	99.92	81%
Length - Class 3 (km):	4.71	4%
Length - Class 4 (km):	6.99	6%
Length - Class 5 (km):	5.44	4%



Conclusion & Next Steps

A35 BreBeMi has good road safety performance but can be improved.

Proposed interventions would enhance safety and increase Star Ratings.

Next step: Implementation of a User-Defined Investment Plan (UDIP).

Project title: iRAP ASSESSMENT OF A35 MOTORWAY: BRESCIA-BERGAMO-MILAN (BREBEMI)

Client:  Aleatica
25126 Brescia, Italy

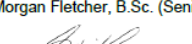
Consultant:  International Road Assessment Programme
(iRAP) 60 Trafalgar Square, London, WC2N 5DS

Project reference: FPZ-ZPP-900-328

iRAP Strategic Projects Delivery Team:

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STAR RATING CERTIFICATE

The International Road Assessment Programme (iRAP) recognises

A35 Brebemi

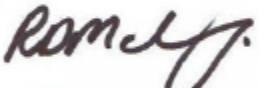
on achievement of a **4-Star or Better Rating for vehicle occupants** on the A35 Brebemi Toll Road, Italy



BY ROAD LENGTH		
Star Ratings	Vehicle Occupant	
	Length (km)	Percent
5 stars	3.00	2.00%
4 stars	121.70	98.00%
3 stars	0.00	0.00%
2 stars	0.00	0.00%
1 star	0.00	0.00%
Not applicable	0.00	0.00%
Totals	124.70	100.00%

A35 Brebemi
 ALEATICA




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GLOBAL DIRECTOR OF ROAD SAFETY
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OFFICER - A35 Brebemi

20 November 2024

Because every life counts.



Certificate #: 0011

Thank you for your attention!
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