The importance of the GSR for the future of vehicle safety

Casualty impact and cost-effectiveness evaluation

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Casualty impact and cost-effectiveness evaluation for the Commission proposal on General Vehicle Safety

Objective:

To **calculate** concrete **cost-effectiveness indicators and numbers of road casualties that could be prevented at an EU-28 level** for sets of safety measures proposed by the European Commission and considered for **mandatory implementation in new vehicles.**

Study scope

The specific scope of the study was defined as

- **Geographic scope**: EU-28
- **Vehicle categories covered**: M1, M2&M3, N1, N2&N3
- **Evaluation period**: 2021–2037
- **Baseline scenario**: No further policy intervention in the transport sector, but voluntary improvements and effects of already implemented policies continue: Continued dispersion of mandatory vehicle safety measures into the legacy fleet and **continued voluntary uptake of the safety measures under consideration**.
- **Action scenario:** 17 safety technologies made mandatory according to Commission proposal.

Assessed proposal on General Vehicle Safety

Measure	Cars (M1)	Buses (M2&M3)	Vans (N1)	Trucks (N2&N3)
AEB-VEH	B		B	
AEB-PCD	C		C	
ALC	B	B	B	B
DDR-DAD	B	B	B	B
DDR-ADR	C	C	C	C
EDR	B		B	
ESS	B	B	B	B
FFW-137	B		B	
FFW-THO	B		B	
HED-MGI	C		C	
ISA-VOL	B	B	B	B
LKA-ELK	B		B	
PSI	B		B	
REV	B	B	B	B
TPM		B	B	B
VIS-DET		B		B
VIS-DIV		D		D

Introduction dates assumed for cost-effectiveness analysis (evaluation period: 2021–2037)

B = 01/09/2021 new approved types, 1/09/2023 new vehicles

C = 01/09/2023 new approved types, 1/09/2025 new vehicles

D = 01/09/2025 new approved types, no mandatory introduction for new vehicles

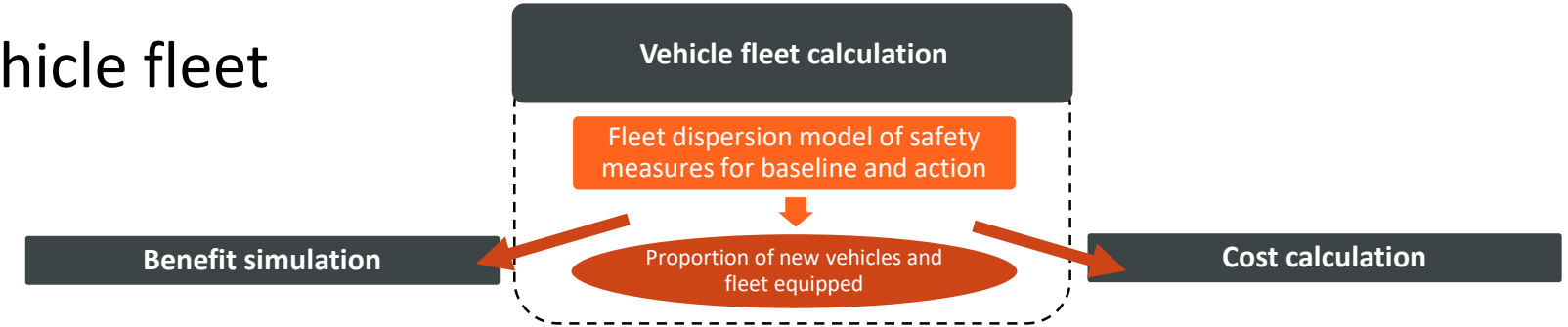
Actual introduction dates might deviate (see Commission Proposal).

Study scope (cont'd)

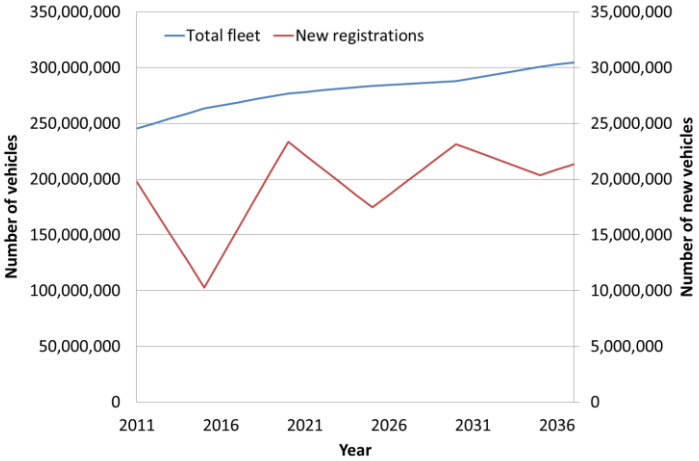
- **Benefits considered**: Monetary values of casualties prevented (fatal, serious, slight) by safety measures
- **Costs considered**: Cost to vehicle manufacturers (OEMs) of fitment of safety measures to new vehicles
- **Treatment of uncertainty**: Interval analysis and scenario analysis
- **Results**: Benefit-to-cost ratios (BCRs) and numbers of casualties prevented. All results are **in comparison to the baseline scenario.**

Method

Vehicle fleet

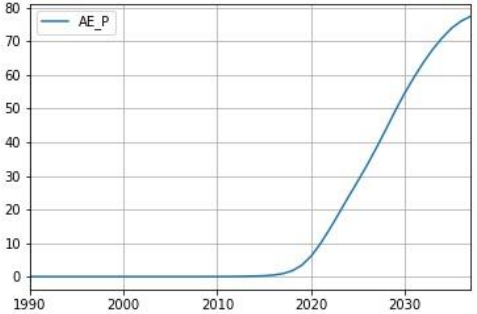


European fleet and new registrations:

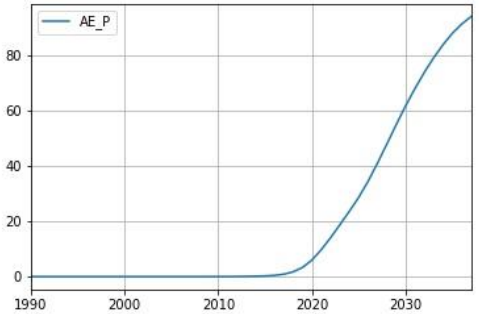


Uptake of safety measures into the fleet:

Voluntary scenario:



Mandatory scenario:



Percentage of all cars within the vehicle fleet equipped with pedestrian-capable AEB in baseline (voluntary uptake) and mandatory implementation scenario modelled

Benefits

Vehicle fleet calculation

Fleet dispersion model of safety measures for baseline and action

Proportion of new vehicles and fleet equipped

Benefit simulation

Accident analysis
Stats19 and CARE

Target populations for safety measures

Measure effectiveness

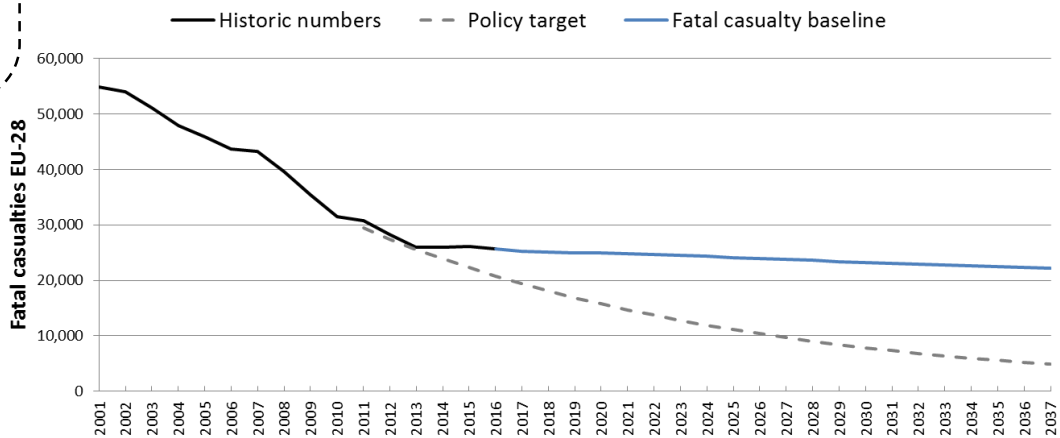
Casualties prevented by measure

Remove casualties prevented from other target populations

Monetary casualty unit values

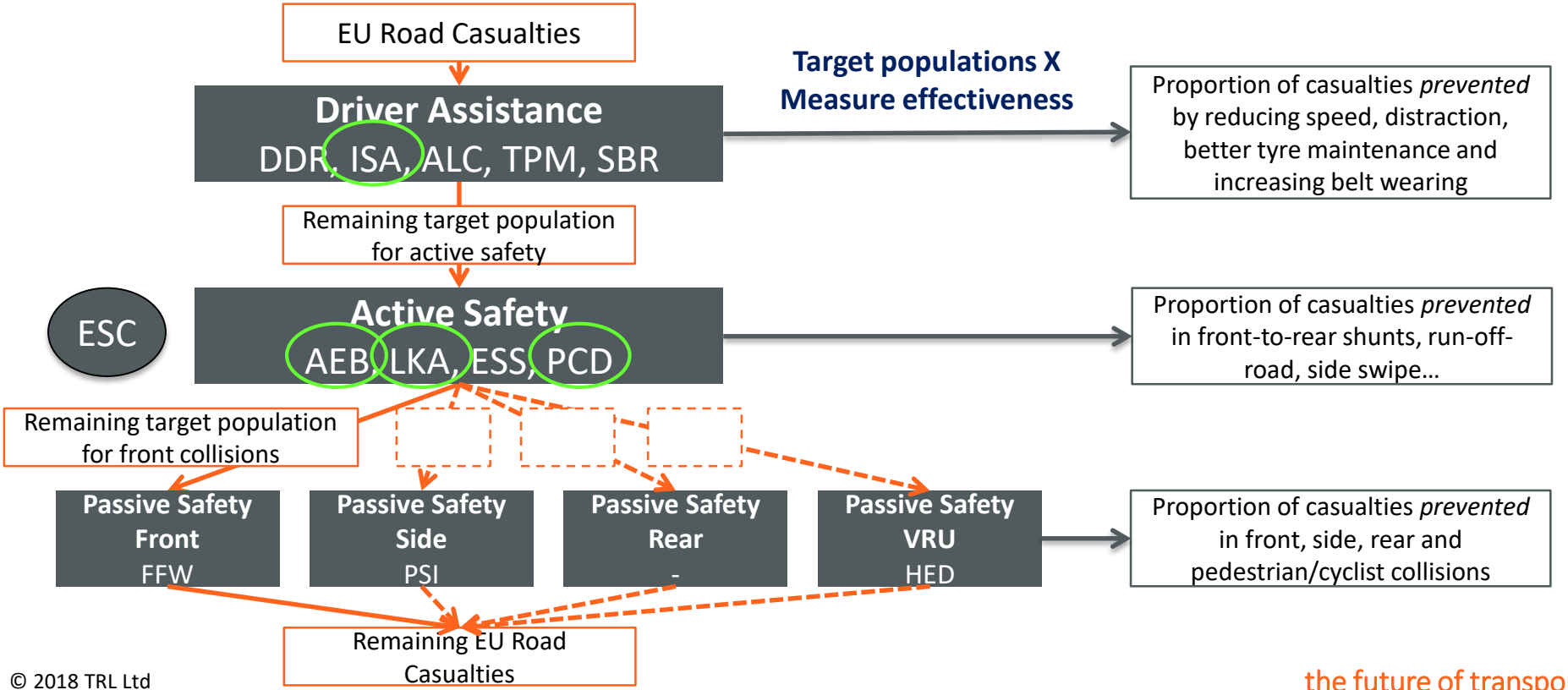
Monetary benefit
EU-28 per annum

European road casualty baseline:

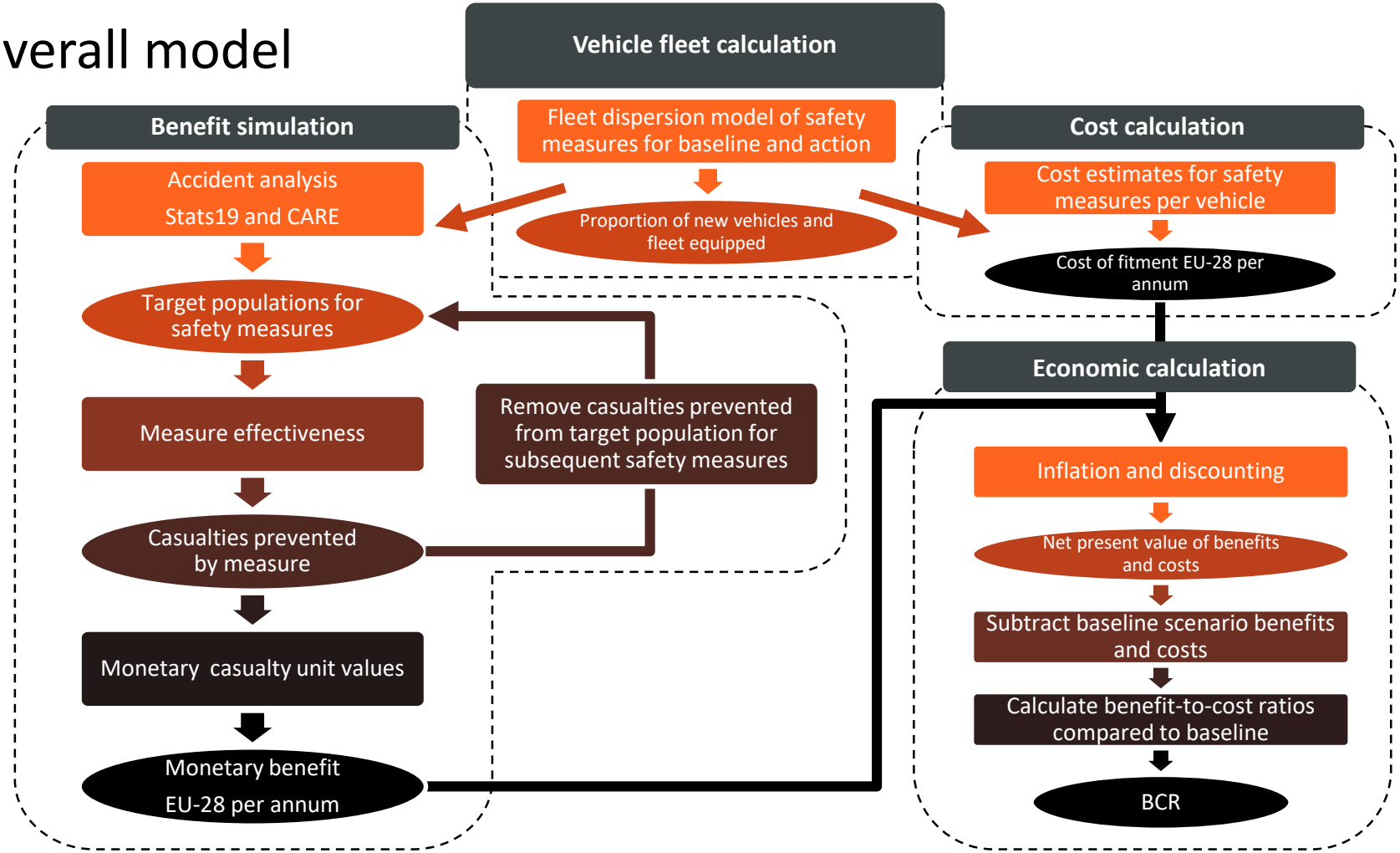


Avoidance of double-counting of casualties prevented

Clustering Levels – Example for Cars



Overall model



Monetisation of casualties prevented & safety measure costs

Benefit valuation:

Casualty severity	Social unit value
Fatality prevented	€1,870,000
Serious casualty prevented	€243,100
Slight casualty prevented	€18,700

Cost valuation:

Initial OEM cost per vehicle for full set of measures	
Cars (M1)	€516
Buses (M2&M3)	€970
Vans (N1)	€521
Trucks (N2&N3)	€1,013

Simulation and Calculation Model

Note that the model takes into account:

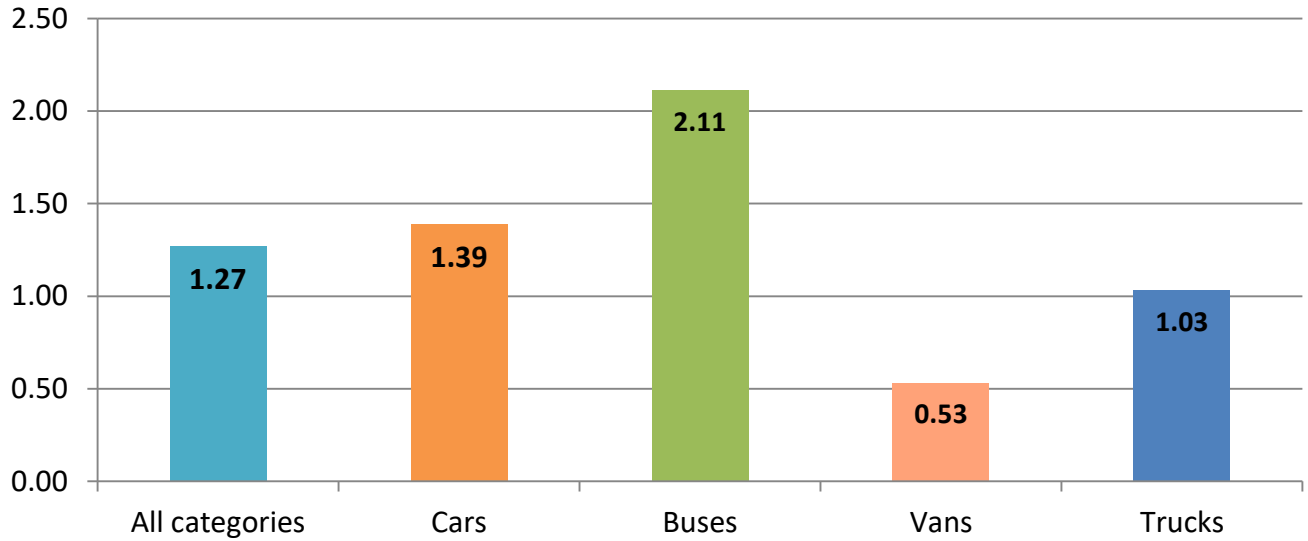
- The **interactions of all measures when implemented together** (to avoid double-counting of casualties prevented by different measures)
- The **voluntary uptake of the proposed measures** expected to happen without policy intervention (baseline scenario)
- The **effects of already existing mandatory measures**, which are still dispersing into the fleet (AEBS and LDWS for trucks and buses, ESC for all categories)

Key results

Key Results

Cost-effectiveness

Benefit-to-cost ratios (BCR) of the Commission Proposal



Values greater 1 indicate that the benefits are greater than the costs

Years: 2021–2037

EU-28

Compared to the baseline scenario

Key Results

Number of casualties prevented by safety measures split by vehicle categories over the evaluation period 2021–2037 across EU-28 compared to the baseline scenario

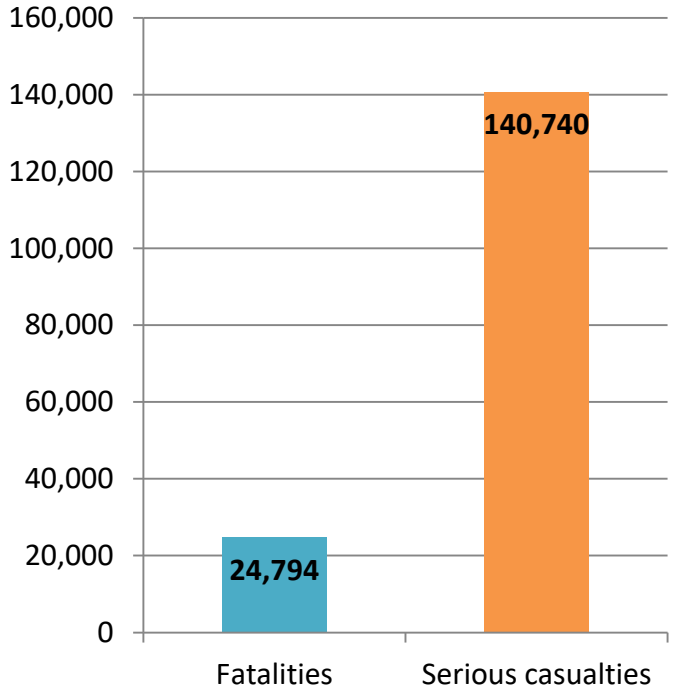
	Cars	Buses	Vans	Trucks
Fatalities prevented	21,337	227	1,283	1,947
Serious casualties prevented	126,390	2,410	6,917	5,023
Slight casualties prevented	470,747	8,174	23,486	13,274

Key Results

Casualties prevented

Total sum; years 2021–2037; EU-28; compared to the baseline scenario

	All categories
Fatalities prevented	24,794
Serious casualties prevented	140,740
Slight casualties prevented	515,681



Conclusions

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- **The Commission proposal on General Vehicle Safety**:
  - An ambitious option to reduce the number of deaths and injuries on EU roads – Savings of almost 25,000 fatalities and 140,000 serious casualties over a 16-year period
  - Cost-effective – Benefits to society exceed the costs with a BCR of 1.27
  - Substantial increase in consumer vehicle prices *not* expected in the medium and long term
  - Technologically advanced – helping the EU Industry to remain competitive with regard to the challenges of developing automated vehicles, because it includes measures such as **Advanced Driver Distraction Recognition, Intelligent Speed Assistance** and **Vulnerable Road User Detection**.

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Thank you