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# Road Safety Key Performance Indicators in Greece


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# Introduction

- In 2022, Greece recorded 635 fatalities in road crashes, achieving a 28% reduction during the last decade.
- The new Greek Road Safety Strategic Plan for the decade 2021-2030, has harmonized its policy with the European road safety strategic plan.
- New targets of halving road crash fatalities and serious injuries in 2030 have been introduced.
- 8 Key Performance Indicators (KPIs) have been set, to better monitor road safety progress during the current decade.

# Objective and Methodology

- Objective: to measure and assess road safety performance in Greece based on the KPIs on:
  - speeding,
  - seat-belt use,
  - helmet use,
  - drink-driving,
  - driver distraction and
  - vehicle safety.
- Data Collection:
  - Surveys on the roadside in May-June & September 2022 for the first 5 KPIs
  - National database of the Ministry of Infrastructure and Transport for the KPI Vehicle Safety
- Based on the common European methodological framework, as developed in the Baseline project.

# KPIs for Road Safety

*EU KPI definitions (EC, 2019)*

| KPI area | KPI definition |
|---|---|
| Speed | Percentage of vehicles travelling within the speed limit |
| Safety belt | Percentage of vehicle occupants using the safety belt or child restraint system correctly |
| Protective equipment | Percentage of riders of PTWs and bicycles wearing a protective helmet |
| DUI of Alcohol | Percentage of drivers driving within the legal limit for blood alcohol content (BAC) |
| Driver Distraction | Percentage of drivers not using a handheld mobile device |
| Vehicle Safety | Percentage of passenger cars with a Euro NCAP safety rating equal or above a threshold |
| Infrastructure | Percentage of distance driven over roads with a rating above an agreed threshold |
| Post-crash care | Time elapsed between the emergency call following a collision resulting in personal injury and the arrival at the scene of the collision of the emergency services |

# Surveys on the Roadside

- The surveys were carried out in appropriately selected locations in 15 regions of Greece.
- A total of 130 locations by road type:
  - urban roads,
  - rural roads (excluding motorways) and
  - motorways.
- The measurements/observations took place on weekdays (Monday-Friday) and weekends (Saturday-Sunday).
- Data on the travelled kilometres per driver were also collected.
- Two levels of stratification were considered (road type and time period or vehicle type) for the estimation of the KPIs.

# KPI Speeding

- Instantaneous speed of passing vehicles in free-flowing traffic conditions was measured with the use of hand-held radar guns during daytime.
- Data were collected for 36.346 vehicles:
  - 39,5% on urban roads, 39% on rural roads and 21,5% on motorways.
- The lowest percentage of vehicles travelling within the legal speed limits was observed on urban roads (55,8%).
- The lowest KPIs were recorded for:
  - motorcycles on urban and rural roads (46,8% and 71,4% respectively)
  - trucks, buses and HGVs on motorways (68,1%).

| Road Type/ Vehicle Type | KPI (95% CI) | Average Speed (km/h) | Std. Deviation (km/h) | V85 (km/h) |
|---|---|---|---|---|
| **Urban Roads** (50km/h) | 55,8% (55,0% - 56,6%) | 48,4 | 9,3 | 57,0 |
| Passenger Car | 55,8% (54,9% - 56,8%) | 48,4 | 9,2 | 57,2 |
| Motorcycle | 46,8% (44,3% - 49,4%) | 51,5 | 10,9 | 60,3 |
| Light trucks/vans | 66,3% (64,1% - 68,6%) | 44,5 | 8,3 | 52,5 |
| Trucks/Buses/HGVs | 83,1% (79,9% - 86,3%) | 38,8 | 5,4 | 43,7 |
| **Rural Roads** (90km/h) | 84,0% (83,4% - 84,6%) | 66,9 | 10,2 | 76,6 |
| Passenger Car | 84,7% (84,1% - 85,4%) | 67,8 | 10,6 | 78,0 |
| Motorcycle | 71,4% (68,1% - 74,7%) | 71,1 | 11,9 | 82,0 |
| Light trucks/vans | 87,7% (86,3% - 89,2%) | 64,1 | 9,9 | 73,9 |
| Trucks, Buses/HGVs | 80,0% (76,7% - 83,3%) | 61,2 | 6,5 | 66,2 |
| **Motorways** (130km/h) | 76,9% (77,2% - 79,2%) | 103,2 | 14,9 | 117,8 |
| Passenger Car | 76,2% (75,0% - 77,4%) | 109,6 | 16,0 | 125,4 |
| Motorcycle | 84,8% (77,5% - 92,0%) | 106,3 | 14,4 | 117,0 |
| Light trucks/vans | 89,9% (88,2% - 91,6%) | 91,3 | 15,5 | 107,1 |
| Trucks, Buses/HGVs | 68,1% (65,6% - 70,5%) | 80,5 | 8,9 | 87,6 |

# KPI Seat-Belt Use

- Data were collected for 47.563 vehicle occupants:
  - 37.046 drivers, 8.525 front passengers and 1.992 rear passengers (in passenger cars only)
  - 40,5% on urban roads, 32,7% on rural roads and 26,8% on motorways
  - 78,7% during weekdays and 21,3% at weekends
- Only 71,8% of passenger cars drivers are using a seat-belt.
- The KPI is significantly lower for drivers of goods vehicles (36,5%), with the lowest value being identified on urban roads (22,2%).
- KPI values for front seat passengers are similar to those for drivers for both vehicle types.
- Seat-belt use by rear passengers in passenger cars is much lower (55,8%).

| Road Type | KPI (95% CI) | |
|---|---|---|
| | Passenger Car | Goods Vehicle |
| Urban Roads | 71,2% (70,4% - 72,0%) | 22,2% (20,6% - 23,9%) |
| Rural Roads | 70,3% (69,4% - 71,2%) | 43,5% (41,5% - 45,6%) |
| Motorways | 83,5% (82,6% - 84,4%) | 47,9% (46,2% - 49,6%) |
| Total | 71,0% (70,5% - 71,5%) | 36,2% (35,1% - 37,2%) |

| Time Period | KPI (95% CI) | |
|---|---|---|
| | Passenger Car | Goods Vehicle |
| Weekday | 69,8% (69,2% - 70,4%) | 33,8% (32,6% - 34,9%) |
| Weekend | 73,6% (72,5% - 74,7%) | 43,6% (40,7% - 46,4%) |
| Total | 71,0% (70,5% - 71,5%) | 36,2% (35,1% - 37,2%) |

# KPI Helmet Use

- Data were collected for 4.079 motorcycle riders, of which 3.464 were drivers and 615 were passengers:
  - 72,6% on urban roads, 22,3% on rural roads and 5,2% on motorways
  - 78,1% during weekdays and 21,9% at weekends
- The national KPI on helmet use by motorcycle riders was 80,3% and 65,5% for passengers.
- The highest use of helmet by motorcyclists is observed on motorways (94,9%).
- KPIs on rural and urban roads were 83,7% and 75,5% respectively.

| Road Type | KPI (95% CI) | |
|---|---|---|
| | Driver | Passenger |
| Urban Roads | 94,9% (91,7% - 98,0%) | - |
| Rural Roads | 83,7% (81,1% - 86,3%) | 68,7% (61,4% - 76,0%) |
| Motorways | 75,5% (73,8% - 77,2%) | 60,5% (55,9% - 65,0%) |
| Total | 80,3% (79,0% - 81,6%) | 65,5% (61,8% - 69,3%) |

| Time Period | KPI (95% CI) | |
|---|---|---|
| | Driver | Passenger |
| Weekday | 80,9% (79,4% - 82,4%) | 68,2% (64,0% - 72,4%) |
| Weekend | 79,0% (76,2% - 81,9%) | 60,0% (51,7% - 68,2%) |
| Total | 80,3% (79,0% - 81,6%) | 65,5% (61,8% - 69,3%) |

# KPI DUI of Alcohol

- Measurements were carried out by the Traffic Police in cooperation with researchers.
- Both the measurement locations and the drivers were sampled randomly.
- Data were collected for 2.894 passenger car drivers:
  - 59,4% on urban roads, 17,3% on rural roads and 23,3% on motorways.
  - 30,2% on weekday/ daytime, 43,8% on weekday/ night-time, 14,7% at weekends/ daytime, 11,4% at weekends/ night-time.
- The KPI is lower during night-time and especially during weekends (96,0%).
- On weekdays, during night-time, the KPI is 98,7%.
- No significant difference was identified among the different road types.

| Time Period | KPI | CI (95%) | |
|---|---|---|---|
| | | Lower Bound | Upper Bound |
| Weekdays/daytime | 99,7% | 99,4% | 100,0% |
| Weekdays/night-time | 98,7% | 98,2% | 99,3% |
| Weekends/daytime | 99,7% | 99,3% | 100,0% |
| Weekends/night-time | 96,0% | 94,2% | 97,7% |
| All periods | 98,8% | 98,5% | 99,2% |

# KPI Driver Distraction

- Data were collected for 38.020 drivers:
  - 39,8% on urban roads, 32,8% on rural roads and 27,4% on motorways
  - 76,4% passenger cars, 15,1% light goods vehicles (LGVs) and 8,5% buses.
- The national KPI is about 93%, meaning that about 7% of drivers use a handheld mobile phone while driving.
- The KPI on urban roads is lower (90,8%) compared to the other road types.
- In total, the performance of LGV and bus drivers is better compared to the passenger car drivers.
- The use of mobile phone by passenger car drivers is slightly higher during weekdays compared to the weekends.

| Road Type | KPI (95% CI) | | |
|---|---|---|---|
| | Passenger Car | Goods Vehicle | Buses |
| Urban Roads | 90,8% (90,3% - 91,3%) | 93,8% (92,9% - 94,8%) | 93,5% (91,4% - 95,7%) |
| Rural Roads | 94,0% (93,6% - 94,5%) | 94,0% (93,0% - 95,0%) | 98,6% (97,1% - 100,0%) |
| Motorways | 93,1% (92,5% - 93,7%) | 93,7% (92,9% - 94,5%) | 90,6% (86,7% - 94,5%) |
| Total | 92,1% (91,8% - 92,4%) | 93,8% (93,3% - 94,4%) | 94,7% (93,3% - 96,1%) |

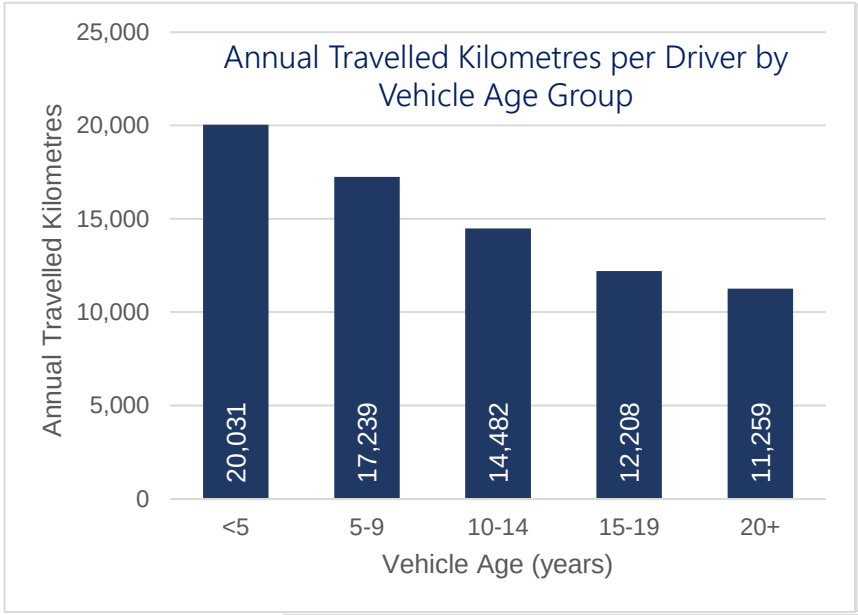
# KPI Vehicle Safety

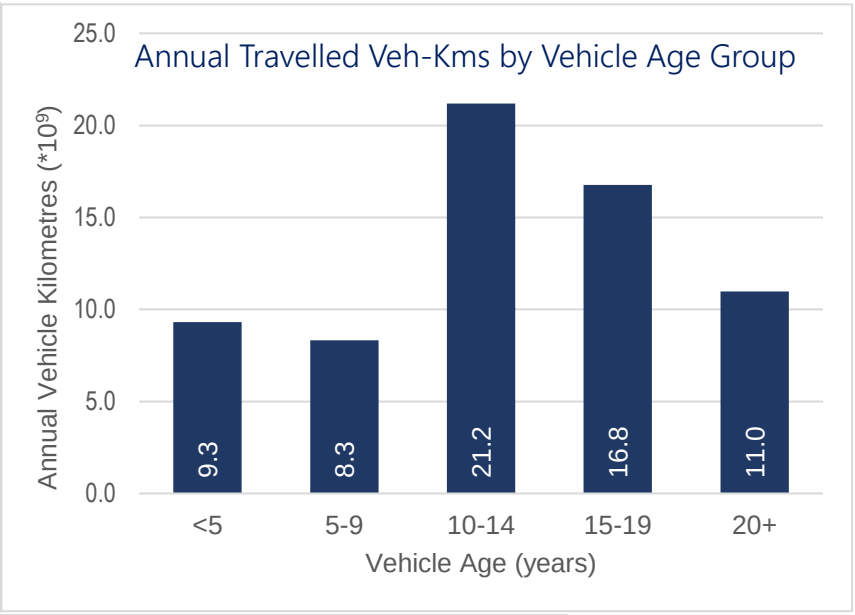
- The average age of the passenger car fleet in Greece was 16,8 years in 2019 and 17,4 years in 2020,
- Greece has among the oldest fleets in the European Union (average age 12 years).
- In 2019, 88,4% of newly registered passenger cars was rated with at least 4 EuroNCAP stars and 60% with 5 stars.
- The respective KPIs were 89,2% and 67,5% in 2020.

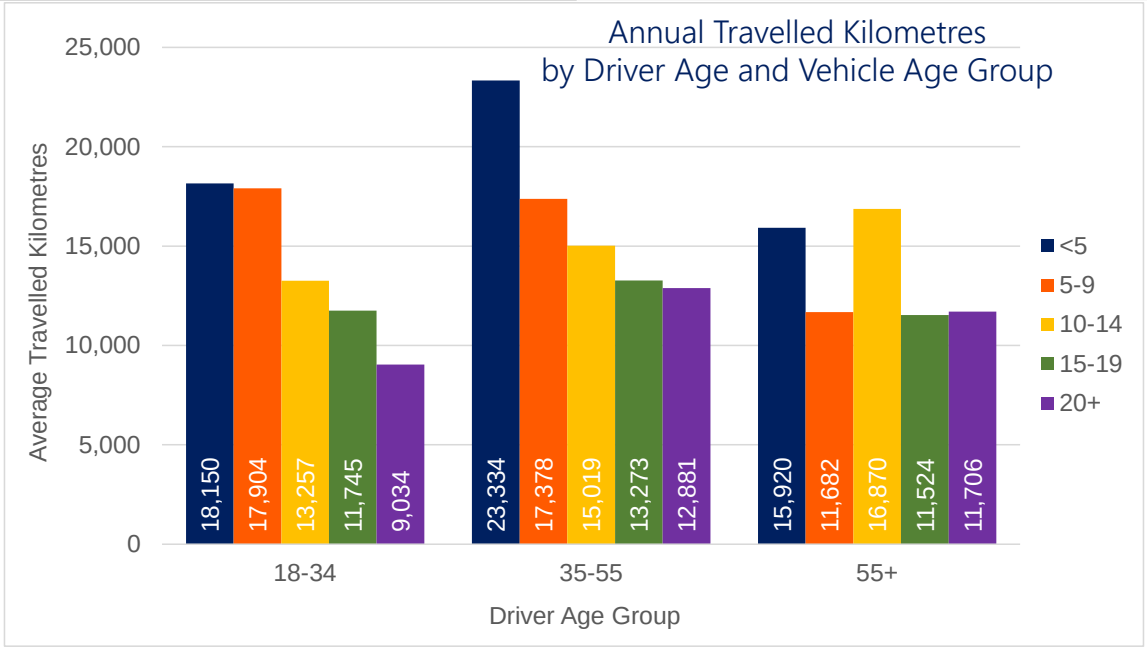
| | 2019 | 2020 |
|---|---|---|
| KPI: at least 4 EuroNCAP stars (excl. passenger cars with no rating) | 90,3% | 92,4% |
| KPI: at least 4 EuroNCAP stars (incl. all passenger cars) | 88,4% | 89,2% |
| KPI: 5 EuroNCAP stars (excl. passenger cars with no rating) | 61,3% | 69,9% |
| KPI: 5 EuroNCAP stars (incl. all passenger cars) | 60,0% | 67,5% |
| Average age of passenger car fleet (years) | 16,8 | 17,4 |

# Exposure Indicators

- The average annual travelled distance for passenger cars in Greece is about 13.0000 kms:
  - 20.000 kms for passenger cars <5 years
  - 11.000 kms for passenger cars >20 years
- In 2019, the number of travelled vehicle-kilometers is estimated at 60,3 billion.
- Male drivers aged between 35-54 years old recorded the highest number of annual travelled kilometres (15.459).

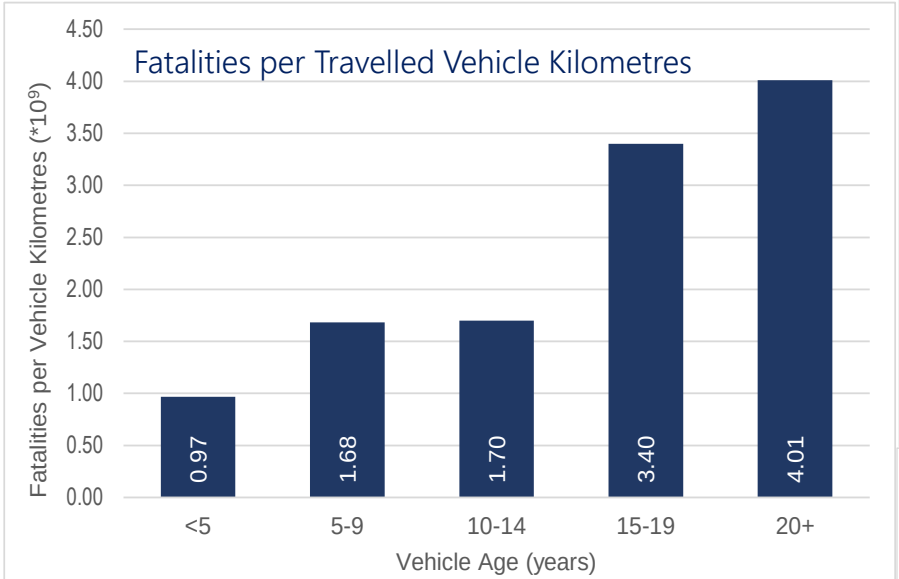


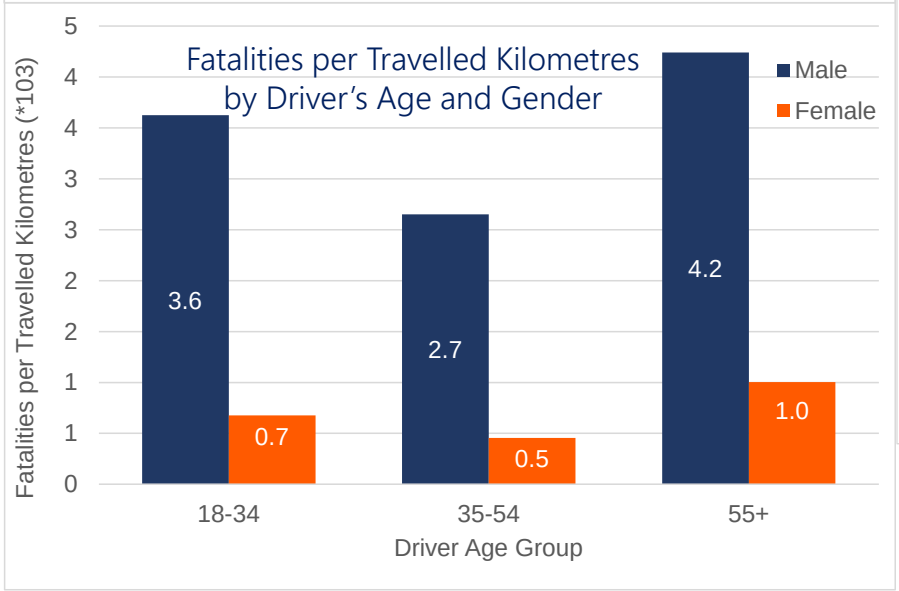



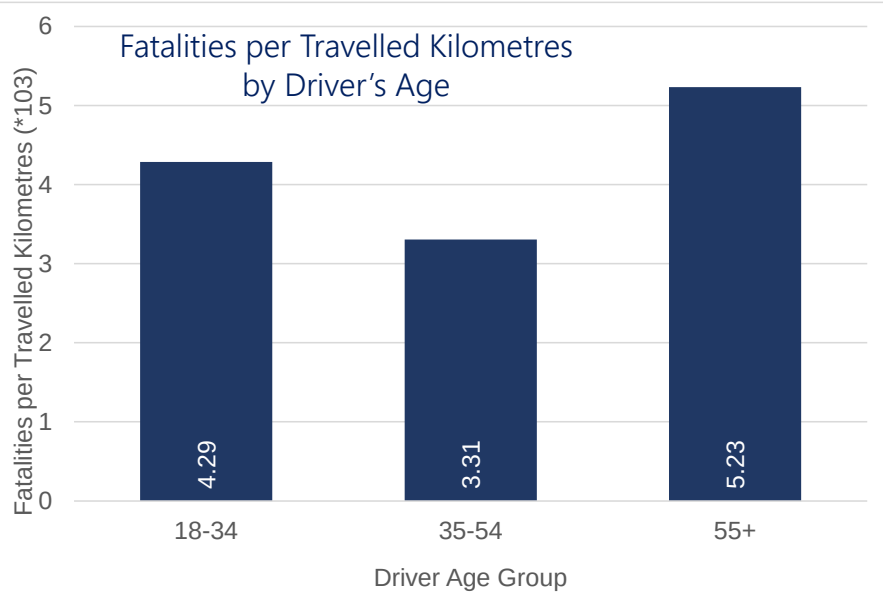



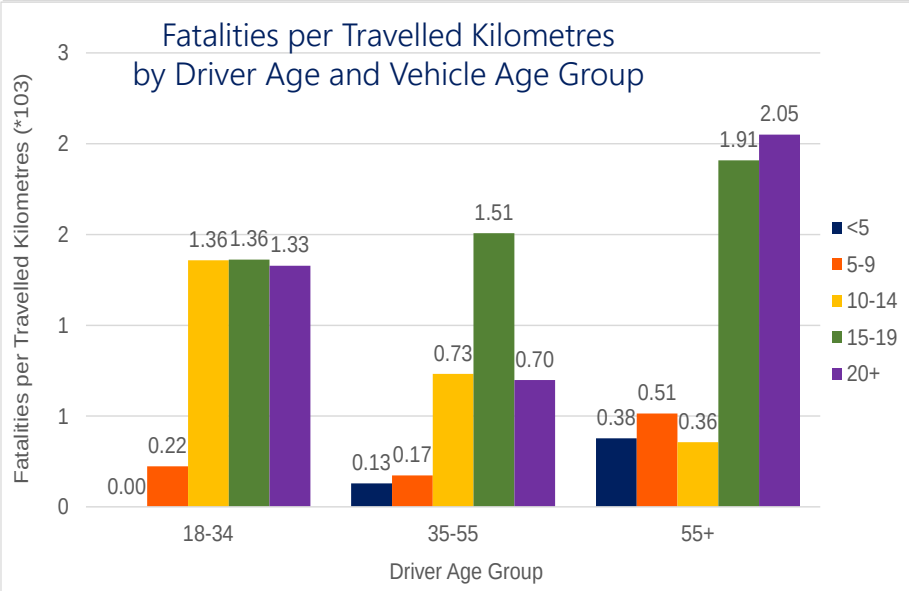
# Risk Exposure Indicators

- The higher risk of being killed in a crash for a driver is found for passenger cars of more than 20 years - about 4 times higher compared to the newest passenger cars.
- Male drivers have 4.6 times higher risk of being killed compared to female drivers.
- Elderly and young drivers have 1.6 times and 1.3 times higher risk compared to drivers aged 35-54 y.o.



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# Discussion

- KPIs are considered essential tools for monitoring the level of road safety in Greece in relation to the targets set at the end of the decade.
- These results could also be exploited in order to take more targeted road safety measures, including more targeted enforcement controls, road safety campaigns, etc.
- Further analysis of these results, alongside with the related exposure and road crash data could reveal the real dimension and main causes of the road safety problem in Greece.

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