### Financial incentives and benefits for vehicle insurance policies using telematics

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> Artificial Intelligence for Road Safety and Mobility Workshop

> > 8<sup>th</sup> UN Global Road Safety Week

Athens, 15 May 2025





# The SShCentre project

### SShCentre

- Coordinated by the Vrije Universiteit Brussel
- > Duration:
  - 12 months (Oct 2023 Sept 2024)
- ➤ Call:
  - Strengthening European energy/mobility/climate policy: Governance recommendations from innovative interdisciplinary collaborations

### > Framework Program:

 Research project SSH CENTER for the European Union's Horizon Europe research and innovation program and the UK Research and Innovation (UKRI) (2023-2024)





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# Background

Climate change, environmental degradation, energy use and road safety are key existential threats that should be addressed

- Transport contributes approximately 25% of EU greenhouse gas emissions, with road transport accounting for over 70%
- Road traffic injuries are a leading cause of death until 29 years globally, with 1.3 million road fatalities annually
- > Driving behavior is considered as one of the most critical factors
- Urged by considerable technological developments, insurers have integrated telematics to their operations to develop an array of Usage-Based-Insurance (UBI) schemes
- The vehicle insurance sector has very low capabilities of further investments and risk (Combined Ratio~100%), due to low insurance premiums and relatively high crash frequency



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# Objectives

> The formulation of a mobility policy recommendation

The provision of financial incentives and benefits by the State for vehicle insurance policies using telematics is proposed across the EU member states

- The demonstration of the socio-economic feasibility of the policy recommendation through a social Cost Benefit Analysis (CBA)
- The interdisciplinary collaboration involving experts from transportation engineering, economics, psychology, and law for policy design and evaluation
- The contribution of a book chapter that outlines the policy recommendation



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## Methodological Approach



Policy proposition

The provision of financial incentives and benefits by the State for vehicle insurance policies using telematics is proposed across the EU member states Financial incentives in the form of a **"Safe Pass" Voucher** for drivers upon the purchase of a telematics insurance policy

Additional Benefits for Safe Drivers: (a) free access in city centers, (b) free parking (in areas that there is a parking cost), and (c) use of bus lanes

Questionnaire Survey in Greece

Social CBA

- **4 Scenarios** are investigated, with different Safe Passes values of €50 (S1), €55 (S2), €60 (S3), €70 (S4)
- A **questionnaire survey** was conducted, to determine the level of public acceptance of each Scenario



Socio-economic benefits estimation by 2030

Investment and Operational Cost estimation

Economic **feasibility** (NPV, IRR)

Sensitivity Analysis



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### Results

- Consistent reduction in road fatalities, serious injuries, fuel consumption, and CO<sub>2</sub> emissions across all Scenarios
- Scenario S3 (Safe Pass of €60) yields optimal socioeconomic performance demonstrating the highest NPV and a high IRR index (24.3%)
- Positive Net Present Values (NPVs) and Internal Rates of Return (IRRs) confirm the socio-economic feasibility in Greece
- Extrapolating the results of the CBA in Greece, to EU and all vehicles, the recommended policy could result to 740-4,440 less road fatalities per year in EU, depending on the level of the financial incentives



Scenarios	<b>S</b> 1	<u>S2</u>	<u>S</u> 3	<u>S4</u>
Safe Pass Value	50€	55€	60€	70€
Annual Safe Pass Offer	0.7 mil	1.5 mil	2.5 mil	3.5 mil
Total State Grant (2024-2030)	-225 mil€	-533.5 mil€	-960 mil€	-1,575 mil€
State Grant (2024)	15 mil€	38.5 mil€	60 mil€	105 mil€
Annual State Grant (2025-2030)	35 mil€	82.5 mil€	150 mil€	245 mil€
Change in socio-economic indicators (2024 -2030)				
Light Injured (persons)	-1,331	-2,841	-4,669	-6,560
Severe Injured (persons)	-62	-131	-219	-307
Fatalities (persons)	-75	-158	-261	-364
Fuel Consumption (litres)	-121 mil	-270 mil	-450 mil	-636 mil
CO <sub>2</sub> Emissions (tons)	-0.3 mil	-0.6 mil	-1 mil	-1.5 mil
PV (0.8%)	320 mil€	685 mil€	1,134 mil€	1,590 mil€
NPV (0.8%)	100 mil€	164 mil€	197 mil€	55 mil€
IRR	52.7%	35.3%	24.3%	4.8%

Note: 2024 indicators multiplied by 75% due to the policy's application post the first quarter.



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- Behavioral change through incentives: The "Safe Pass" Voucher and additional non-monetary benefits encourage safer, eco-friendlier driving behavior
- Positive reinforcement model: Shifting from punitive traffic enforcement to reward-based mobility governance
- Contribution to societal goals: Supports the achievement of Vision Zero (eliminating road fatalities) and the EU Green Deal (carbon neutrality by 2050)
- Sustainable urban mobility: Enhances safety, reduces environmental impact, and promotes equitable access to urban centers through responsible driving practices
- Low-cost, high-impact intervention: Policy leverages existing insurance and telematics infrastructure, minimizing public investment requirements while maximizing societal returns



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## Scientific and Social Impact

#### Scientific Contributions:

- Development of a policy-driven framework combining telematics deployment, economic incentives, and driver behavior monitoring
- Application of a comprehensive Social CBA, easily transferable and adaptable to other countries
- Multidisciplinary approach incorporating transport engineering, economics, behavioral psychology, and digital law for robust policy design

#### Societal Contributions:

- Reduction in road fatalities, injuries, fuel consumption, and CO<sub>2</sub> emissions across all Scenarios
- Creation of equitable access to safer, more affordable insurance and mobility solutions
- Scalable policy model ready for adaptation across EU Member States, promoting inclusive, climate-resilient transport systems



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# **Future Challenges**

- Adapting the telematics-based incentive model to cities and regions with different legal, socioeconomic, and mobility profiles
- Ensuring that initial improvements in driving behavior are maintained beyond the incentive period
- Ensuring broad social acceptance and equitable access to financial benefits
- Integrating recommended telematics policy seamlessly with national road safety plans, sustainable mobility strategies, and the EU Green Deal objectives





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