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Development of the Road Safety Strategic Plan in Greece, 2021-2030

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Abstract

Despite the most significant improvement in road safety performance among the EU countries during the period 2010-2020 and achieving the target of halving road fatalities, Greece still remains behind the EU average in terms of road fatalities per population. This paper presents the Greek Road Safety Strategic Plan for the decade 2021-2030. With this Plan, Greece adopts the Safe System Approach and the Vision Zero by 2050. The Strategic Plan is in alignment with the EU Road Safety Strategy aiming to halve road fatalities and serious injuries by 2030. Eight targets for road crash casualties' reduction and eight targets for the improvement of road safety performance are proposed for 2030, with intermediate targets for 2025. A list of 200 Road Safety Measures within 44 Actions within the five UN Pillars is also set. Finally, an integrated system for monitoring road safety is proposed.

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1. Introduction

Greece was the only country that achieved the 2010-2020 target of 50% reduction in road fatalities across the Member States of the European Union (EU), with a performance of -54%. However, in 2021, a slight increase of 4% compared to 2020 figures was recorded (NTUA Road Safety Observatory, 2022). This slight increase is mainly attributed to the returning back to normal traffic from the pandemic period. In terms of road fatalities per million

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inhabitants, in 2021, Greece is ranked 22nd among the EU countries (57 road fatalities per million inhabitants), which is significantly higher than the EU average (44 road fatalities per million inhabitants) (European Commission, 2022).

The enormous economic dimension of this major social problem should be taken into account. In Greece, road crashes represent a significant cost for society, estimated at around 2.7 billion Euros, representing almost 1.5% of Greece's Gross Domestic Product (Kourtis et al., 2020). This cost is almost tripled if the real numbers of injuries and crashes resulting only in material damage are taken into account.

The main objective of this paper is the presentation of the Greek Road Safety Strategic Plan for the period 2021-2030. The Road Safety Strategic Plan was developed by the Hellenic Ministry of Infrastructure and Transport with the scientific support of the Department of Transportation Planning and Engineering of the National Technical University of Athens. The National Strategic Plan led to the definition, implementation and monitoring of the necessary actions to drastically reduce the number of road crashes and related casualties. The development of the National Strategic Road Safety Plan was based on existing international trends, the detailed analysis of the capabilities of the Greek reality as well as the systematic open consultation.

2. Road Safety in Greece

Figure 1 depicts the evolution of some of the most basic road safety figures in Greece for the period 2010-2021, in which a remarkable improvement in the road safety outcomes can be observed.

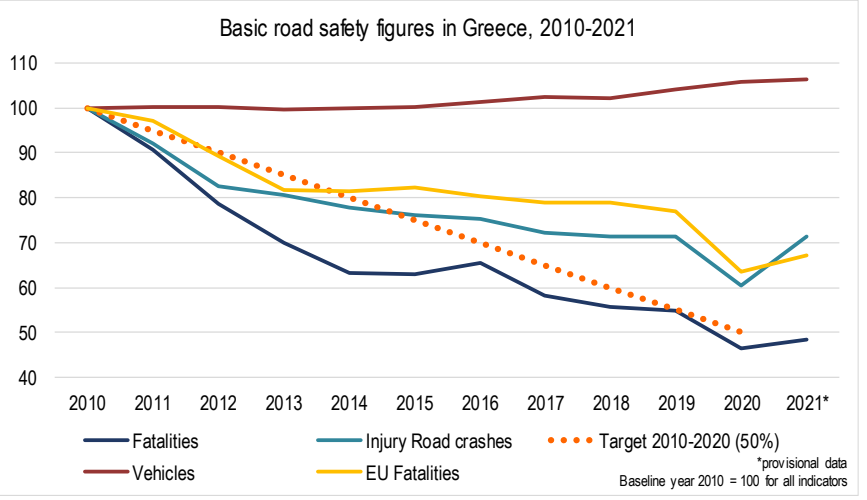

Fig. 1. Evolution of basic road safety figures in Greece for the period 2010-2021

This significant decrease of road crashes and road fatalities could be attributed not only to the fact that Greece was under the economic crisis which brought fewer vehicle-kilometers and less aggressive driving behaviour but also due to the more systematic initiatives taken by the Authorities such as the intensification of enforcement, great improvement of the main road network (from 750km motorways in 2007 to 2,200km in 2018), implementation of city mobility and safety plans etc.

According to specialized analyses of road crash data in Greece and their comparative assessment with related road crash analyses for Europe (European Commission, 2021; ITF, 2019), the most critical factors (ordered by importance) that contribute to the occurrence and severity of road crashes in Greece are the following (also shown in Table 1):

- Driving at high speeds;
- High rates of motorcycle traffic;
- Low seatbelt and helmet use rates;
- Mobile phone use while driving;
- Driving under the influence of alcohol.

Table 1. Basic road fatality characteristics in Greece and in the European Union (source: ELSTAT, EC-CARE.).

	Greece			EU-27
	2019	2010-2019 (%)	2019 (%)	2019 (%)
Total fatalities	**688**	**-45%**	100%	100%
Drivers	470	-44%	68%	65%
Passengers	73	**-70%**	11%	15%
Pedestrians	145	**-19%**	21%	20%
Inside built-up areas	370	-38%	**54%**	39%
Outside built-up areas	318	-52%	**46%**	61%
On motorways	50	-43%	7%	9%
Passenger Cars	202	**-63%**	**29%**	44%
Motorcycles/Mopeds	247	-55%	**36%**	18%
Bicycles	22	**-4%**	3%	9%
Young drivers (18-24)	61	-54%	9%	8%
Older drivers (65+)	99	**-24%**	14%	15%
Children (0-14)	12	**-60%**	2%	2%
Male drivers	441	-43%	**64%**	55%
Female drivers	29	-52%	4%	8%
In crashes with HGV	40	**-61%**	**6%**	13%
In single-vehicle crashes	280	-44%	**41%**	31%

The comparison of Greek and EU road crash statistics for 2019, as presented in Table 1, revealed the most significant road safety problems in Greece. One of them was the particularly high rate of powered two-wheeler (motorcycles and mopeds) riders' fatalities (36%), which was twice the respective EU average (18%). In 2019, Greece also presented one of the highest rates (54%) of road fatalities inside built-up areas, mainly due to motorcycle crashes. Moreover, 41% of total road fatalities were vehicle occupants in single-vehicle road crashes (EU average 31%), mainly due to inappropriate high speeds.

3. Road Safety Targets for the decade 2021-2030

The development of the Road Safety Strategic Plan for the decade 2021-2030 was based on a holistic approach of the safety of the road transport system and adopted two core international road safety trends: the Vision Zero by 2050 (Government Offices of Sweden, 2016) and the Safe System Approach (ITF, 2016). This new approach defined four main directions of the Road Safety Plan (i.e. Ambitious Vision, Effective Implementation, Innovative Technologies and Shared Responsibility) as also presented in Figure 2.

Fig. 2. Directions of the Road Safety Strategic Plan for the decade 2021-2030

Specifically, the Road Safety Strategic Plan constitutes the basic tool in order to achieve a new ambitious vision. The ambitious vision concerns zero fatalities in road crashes in the long term, which will be achieved through individual realistic quantitative targets, giving also emphasis on the safe mobility of all road users (Public Transport promotion, low speeds, etc.). In order to achieve this ambitious vision, special importance is given to the efficient implementation of the Strategic Plan, through targeted funding worthy of the Plan, effective management of all efforts and systematic monitoring, revision and further improvement of road safety actions. The utilization of innovative technologies is also expected to play a decisive role, which will concern the digital management of the road traffic system as a whole, the dynamic interconnectivity of bodies and means of transport, and the automation of traffic for the creation of a harmonized safe road system.

For this holistic and integrated approach, the promotion of the shared responsibility among all related stakeholders and citizens will play a crucial role, through the Safe System Approach. Furthermore, improving the habits of all road users will play a decisive role, both in terms of road behaviour (low speeds, defensive driving behavior, attention to vulnerable road users) and in terms of traffic habits (change in the choice of transport mode and parking options, promoting Public Transport).

The Road Safety Strategic Plan for the period 2021-2030 is in alignment with the European Road Safety Strategy (European Commission, 2019), aiming to reduce the number of fatalities and serious injuries in road crashes by 50% by 2030, with 2019 as the baseline year (according also to EU decisions). 2020 was not selected as the baseline year as it cannot be considered representative due to the impact of the COVID-19 pandemic on road safety outcomes (Wegman & Katrakazas, 2021).

Based on the analysis of the current road safety situation in Greece and in alignment with the European road safety targets, eight quantitative targets were set for the reduction of casualties in road crashes for the decade 2021-2030, as presented in Table 2.

Table 2. Targets for the reduction of casualties in road crashes.

	Target			Target (% reduction)			Lives to be saved (annually)	
	Baseline year 2019	2025	**2030**	Baseline year 2019	2025	**2030**	2025	**2030**
1. Fatalities	688	482	**344**	-	30%	**50%**	206	**344**
2. Killed Motorcyclists	247	148	**84**	-	40%	**66%**	99	**163**
3. Cities with zero fatalities*	9	40	**49**	-	-	**-**	85	**105**
4. Killed on motorways	50	10	**0**	-	80%	**100%**	40	**50**
5. Killed on Greek islands	124	74	**50**	-	40%	**60%**	50	**74**
6. Killed in single-vehicle crashes	280	152	**95**	51%**	40%**	**35%****	128	**185**
7.Road safety performance (fatality/population rate below EU average)	688	*482****	***344*****	21st position	16th position	**13th position**	*206****	**344*****
8. Serious Injuries	652	456	**326**	-	30%	**50%**	196*****	**326*****

** Cities with population between 50,000 and 100,000 residents*

*** Percentage of killed persons in single vehicle crashes in total number of killed occupants (drivers and passengers)*

**** The estimation of the figures is based on population projections for Greece from the World Bank and the assumption that the same declining trend of road fatalities per population with that of the decade 2021-2030 remains for all EU countries, while Greece achieves the target of halving road fatalities in 2030*

***** Seriously Injured road users to be saved (annually)*

Additional targets have been set for eight road safety Key Performance Indicators (KPIs) (European Commission, 2019), which are directly linked to the prevention of fatalities in road crashes, in order to emphasize on the intervention strategy and the achievement of the results (Table 3).

Table 3. Targets for the improvement of road safety performance.

KPIs	Baseline year 2019	Target 2025	**Target 2030**
1. Speeding	40%	< 25%	**< 20%**
2. Seat-belt use	69%	> 85%	**> 95%**
3. Helmet use	74%	> 85%	**> 95%**
4. Driving under the influence of alcohol	-	-30%*	**-50%***
5. Mobile phone use	10%	< 5%	**< 2%**
6. Percentage of new passenger cars with 5 Euro NCAP stars	50%	70%	**> 99%**
7. Percentage of TEN-T network (≥3 stars)	50%**	65%	**80%**
8. Emergency response time	-	-20%*	**-35%***

** Percentage reduction compared to the baseline year*
*** Estimation to be confirmed after the relevant Network-wide road safety assessment*

4. Structure of Road Safety Strategic Plan Implementation Authorities

For the success of a Strategic Plan and the achievement of the targets, it becomes necessary to implement a road safety system, in which the responsibilities and the role of each Implementing Authority are precisely defined. Various coordination issues, monitoring and evaluation of the implemented Road Safety Actions and Measures should be regulated effectively. Moreover, the targets and the results of road safety policy should be well communicated to both stakeholders and citizens.

Among the key responsibilities of the Authorities taken into account in the design of the structure of Road Safety Strategic Plan are the following:

- the development of the National Road Safety Strategy,
- monitoring of road safety targets,
- securing and allocating the necessary resources for the implementation of road safety Actions and Measures,
- the coordination and control of all Authorities implementing the Actions and Measures,
- the coordination of communication and joint Actions of the co-competent Authorities,
- the creation of a system for monitoring and evaluating the results of Actions and Measures.

In Greece, the coordination of the Authorities that are responsible for the implementation of the National Road Safety Strategic Plan and the monitoring of their work are basic responsibilities of the Road Safety Governmental Committee. This Committee consists of the Deputy Minister of Infrastructure and Transport (Chairman), the Deputy Minister of Citizen Protection (Vice-Chairman), the Deputy Minister of Health, the Deputy Minister of Interior, the Deputy Minister of Education and Religious Affairs and the Deputy Minister of Digital Governance. The Road Safety Governmental Committee is supported by Executive Bodies (Road Safety Executive Committee), Advisory Bodies (Special Permanent Committee on Road Safety, National Road Safety Council) and Supporting Bodies (National Road Safety Fund, National Road Safety Observatory).

5. Road Safety Actions for the decade 2021-2030

In the Road Safety Strategic Plan for the decade 2021-2030, 44 Road Safety Actions and 200 Road Safety Measures are foreseen. These Actions and Measures have been allocated to the five United Nations (UN) Road Safety Pillars according to Table 4. For each one of these Pillars, Actions and Measures have been defined to be implemented by specific Authorities based on the principles of the Vision Zero and the Safe System Approach. These Actions and Measures will be implemented at both national and regional/local level. In some cases, the cooperation of multiple Authorities is required for their implementation (e.g. Ministries, General Secretariats of Ministries, Regions, and Municipalities). These Action and Measures have been defined based on:

- the experience from other countries and the directions of the European Union,
- the specific road safety problems in Greece (motorcycles, speeding, urban areas etc.) and,
- their influence on the achievement of the targets set.

Table 4. Targets for the improvement of road safety performance.

Pillars	Actions	Measures
Road Safety Management	9	40
Road User Behaviour	8	40
Road Infrastructure & Traffic	13	61
Vehicles	8	31
Post-crash care	6	28
Total	**44**	**200**

The 44 Road Safety Actions foreseen in the Road Safety Strategic Plan for the decade 2021-2030 are presented by Road Safety Pillar in Table 5.

Table 5. Road Safety Actions by Pillar.

Road Safety Pillars	**Road Safety Actions**
Road Safety Management	M1. Integrated Road Safety Management Structure, M2. Road Safety Law, M3. Road Safety Fund, M4. Road Safety Observatory, M5. Road Traffic Code, M6. Infringement System Management, M7. National Road Safety Communication Policy, M8. Road Safety Action Plans, M9. Road Safety Research
Road User Behaviour	B1. Enforcement, B2. Driving Licenses, B3. Driver Education/Training, B4. School Education, B5. Campaigns, B6. Priorities for Driver Behaviour Improvement, B7. Protective Equipment Use, B8. Telematics
Road Infrastructure & Traffic	I1. Integrated Management of Mobility, I2. Speed limits revision, I3. Speed management, I4. Road Safety Audit, I5. Improvements in High Risk Sites on Rural Road Network, I6. Interventions in the Rural Road Network, I7. Large Scale Infrastructure Projects, I8. Interventions in the Urban Road Network, I9. Traffic Calming Measures, I10. Pedestrian, Bicycle and e-Scooter Traffic, I11. Road Safety Traffic Regulations, I12. Roadside Work Management, I13. Regulations
Vehicles	V1. Vehicle Fleet Renewal, V2. Vehicle Digital Identity, V3. Vehicle Technical Inspection, V4. New active safety systems, V5. New passive safety systems, V6. Regulations, V7. Fleet safety management, V8. Connected & Automated Vehicles
Post-crash care	P1. Intervention Time Reduction, P2. Enhancing Emergency Response Units, P3. First aid driver training, P4. Hospital Care Improvement, P5. Establishment of Trauma Registry, P6. Road Crash Victims' Support

6. Road Safety Monitoring System

Monitoring the implementation of Road Safety Actions and evaluating road safety performance are essential elements for effective road safety management. They are also important to ensure that available funding is spent in the most efficient way. To that end, in the Road Safety Strategic Plan for the period 2021-2030, a three-level integrated system is suggested:

- Monitoring the implementation of Road Safety Actions, as defined in the Strategic Plan (budget, timeframe, etc.).
- Monitoring road safety performance compared to targets set in the Strategic Plan.
- Evaluating the effectiveness of the road safety measures by comparing road safety performance before and after their implementation.

The steps required to enable the monitoring of the implementation of the Road Safety Action, through the National Road Safety Observatory include the systematic collection of information for the implementation of the Actions foreseen in the Strategic Plan, detailed progress reports of the work of the competent implementing Authorities to the Road Safety Governmental Committee every six months and the use of appropriate monitoring indicators.

Road safety performance will be monitored at both National and Regional/Local level. In order to monitor the road safety performance effectively, a series of quantitative indicators have been defined, which are related to the final road safety results (road crashes and casualties) and interim results related to road users' behaviour, road infrastructure safety, vehicle safety and emergency response time.

The evaluation of the effectiveness of the implemented Road Safety Actions and Measures provides the necessary documentation for their necessity in order to solve the targeted road safety issues and for their influence on the final outcomes through the associated quantitative targets. The process of the evaluation includes four stages that concern

the collection of the necessary data, the selection of the appropriate methods and evaluation indicators for each category of Actions and Measures, the reliable implementation of these evaluation methods for specific areas and time periods, and finally the publication of the evaluation results.

7. Conclusions

Despite the most significant improvement in road safety performance among the EU countries during the period 2010-2020 and achieving the target of 50% reduction in road fatalities, Greece still remains behind the EU average in terms of road fatalities per million population. Taken also into account the enormous economic dimension of this major social problem, the need for additional targeted Actions that will improve the road safety level in Greece is perceived. In this paper, the Greek Road Safety Strategic Plan for the period 2021-2030 was presented.

With the Road Safety Strategic Plan for the decade 2021-2030, Greece has adopted the Safe System Approach and the Vision Zero by 2050. The Strategic Plan is in alignment with the EU Road Safety Strategy aiming to halve road fatalities and serious injuries by 2030, with 2019 as the baseline year. Eight targets for road crash casualties' reduction and eight targets for the improvement of road safety performance have been proposed for 2030, with intermediate targets for 2025. Moreover, a complete list of 200 Road Safety Measures within 44 Actions within the five UN Pillars (Road Safety Management, Road User Behaviour, Road Infrastructure & Traffic, Vehicles, Post-crash care) was set. Lastly, an integrated system for monitoring road safety was proposed aiming to provide a continuous picture of the Strategic Plan Implementation and the necessary adjustment of the efforts in order to meet the targets set at the end of the decade.

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