





EU Road Safety Exchange Workshop GREECE

Athens March 31, 2025

## Challenges for Power-Two Wheelers and Urban Roads Safety in Greece



together with Katerina Folla, PhD Candidate

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#### **Presentation Outline**

- Key Statistics
- Problems and Actions
- Concluding Remarks



## **Key Statistics**



#### Fatalities, Greece 2012-2022

#### gc2. Road Fatalities Basic Characteristics, Greece 2012 - 2022

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2022/2012
Total road fatalities	988	879	795	793	824	731	700	688	584	624	654	-34%
Pedestrians killed	170	151	125	128	149	118	146	145	76	95	112	-34%
Motorcyclists killed	282	271	278	237	240	216	190	228	188	214	190	-33%
Moped riders killed	35	25	20	32	25	32	27	19	24	21	21	-40%
Cyclists killed	21	15	19	11	18	11	12	22	12	14	13	-38%
Young drivers killed (18-24)	94	74	82	72	67	72	60	61	54	62	66	-30%
Older drivers killed (65+)	124	116	93	117	114	99	103	99	92	91	103	-17%
Children killed (0-14)	21	17	10	6	19	12	10	12	18	19	7	-67%
Men drivers killed	618	538	505	514	509	481	420	441	406	414	433	-30%
Women drivers killed	33	44	35	31	39	26	30	29	27	33	31	-6%
Non national drivers killed	76	53	69	49	55	53	47	53	49	45	23	-70%
Non national riders killed	33	25	40	34	27	24	24	26	26	25	40	21%
Inside built up areas	499	464	401	388	427	340	367	370	325	314	312	-37%
Outside built up areas	489	415	394	405	397	391	333	318	259	310	342	-30%
In junctions - Inside built up areas	154	139	132	107	127	120	128	92	109	102	89	-42%
In junctions - Outside built up areas	65	35	51	49	28	50	29	35	31	30	19	-71%
On motorways	57	79	56	53	45	54	61	50	34	38	52	-9%
When raining	99	68	103	82	64	63	62	47	37	51	38	-62%
During daylight	527	473	431	418	448	419	408	395	336	346	370	-30%
During nightime	402	366	311	335	339	277	260	261	218	243	247	-39%
Killed in single vehicle crashes	431	381	308	336	322	301	274	280	276	286	290	-33%

Notes Figures in italics are based on provisional data Issued: July 8th, 2024

About the data: nrso-data-gr.pdf

Sources: Hellenic Statistical Authority (ELSTAT)

Police

Processing: National Technical University of Athens -Road Safety Observatory Road fatalities in Greece have decreased by 34% since 2012, with the highest reduction recorded in mopeds (by 40%)

A huge decrease was observed in fatalities in junctions outside built-up areas in 2022 compared to 2012

Fatalities during raining conditions have decreased significantly since 2012 (by 62%)



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Processing: <u>NTUA - Road Safety Observatory</u>

## PTW Fatalities per population

- Motorcycles and mopeds (including ebikes >25km/h) are preferred by a large part of population in Greece, especially during summer months
- The proportion of motorcycles in the total vehicle fleet was 20% in 2023, while mopeds represented another 12%
- In 2023, Greece had the highest motorcyclist fatality rate in the EU (18 fatalities per million population), while the EU average was about 8

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Notes: 2022 data for CY, CZ, EL, SE, MT; 2021 data for IE; 2020 data for LV Source: CARE database

Processing: <u>NTUA - Road Safety Observatory</u>

#### Fatalities by Transport Mode in the EU

- Most fatalities in the EU concern passenger cars (44%)
- PTW fatalities in the EU account for 20%
- Greece has the highest percentage of PTW fatalities in the EU (32%)

FU 0% 20% 40% 60% 80% 100% Passenger Car PTW Cycle Pedestrian Other/unknown

BE BG

DF

EL ES

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Notes: 2022 data for CY, CZ, EL, SE, MT; 2021 data for IE; 2020 data for LV Source: CARE database

Fatalities by transport mode, 2023

Processing: <u>NTUA - Road Safety Observatory</u>

### Fatalities by Road Type in the EU

- Most fatalities in the EU occurred on rural roads (53%)
- In Greece, about half of road crash fatalities (48%) were recorded on urban roads
- Greece was the 6<sup>th</sup> MS with the highest percentage of urban fatalities in the EU





Notes: 2022 data for EL, SE, MT; 2021 data for IE; 2020 data for LV Source: CARE database Processing: <u>NTUA - Road Safety Observatory</u>

		Fatalities	\$			Road Cras	nes		Fatalities	s per 100 cras	hes
	Inside	Outside			Inside	Outside			Inside	Outside	
	built-up area	built-up area	Total	%	built-up area l	built-up area	Total	%	built-up area b	built-up area	Total
Passenger car	83	178	261	40%	6,500	1,317	7,817	45%	1.3	13.5	3.3
Lorry	8	36	44	7%	647	378	1,025	6%	1.2	9.5	4.3
Bus	0	0	0	0%	177	20	197	1%	0.0	0.0	0.0
Two-wheel, of 50 cc or over	128	62	190	29%	5,210	585	5,795	33%	2.5	10.6	3.3
Two-wheel, up to 49 cc	10	11	21	3%	305	71	376	2%	3.3	15.5	5.6
Pedal cycle	7	6	13	2%	184	27	211	1%	3.8	22.2	6.2
Pedestrians	73	39	112	17%	1,518	89	1,607	9%	4.8	43.8	7.0
Other	3	10	13	2%	252	68	320	2%	1.2	14.7	4.1
Total	312	342	654	100%	14,793	2,555	17,348	100%	2.1	13.4	3.8
%	48%	<b>52%</b>	100%	-	85%	15%	100%	-	-	-	-

Notes: 2022 data for CY, CZ, EL, SE, MT; 2021 data for IE; 2020 data for LV Sources: CARE database, Hellenic Statistical Authority (ELSTAT)

Outside Built-up

Processing: NTUA - Road Safety Observatory

#### Fatalities by Road Type and Transport Mode

- $\succ$  In 2022, 40% of fatalities were passenger car occupants in Greece
- Most car occupant fatalities occurred outside urban areas, while most **PTW** and pedestrian fatalities occurred inside urban areas
- The percentage of PTW fatalities inside urban areas (44%) was considerably higher compared to the respective EU percentage (20%)
- > The crash **severity** of motorcyclists was 1.9 times higher than that of passenger cars inside urban areas in Greece, while the severity of moped riders was 2.6 times higher

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EU

56%



Greece

#### Urban road fatalities by Age and Gender

- ➢ 84% of fatalities occurred on urban roads were males, higher than the EU average (75%)
- 34% of killed people on urban roads were aged between 25-49 years old and 31% were more than 64 years old
- People aged 18-24 y.o. constitute 17% of urban road fatalities, while the respective EU ratio is 10%





Notes: 2022 data for CY, CZ, EL, SE, MT; 2021 data for IE; 2020 data for LV Source: CARE database Processing: <u>NTUA - Road Safety Observatory</u>

#### Urban road fatalities by Crash Characteristics

- 54% of urban road fatalities occurred in single vehicle crashes
- > 15% of urban road fatalities occurred at junctions
- Most urban road fatalities were recorded the nighttime at weekends and on Fridays (32%)







Source: Hellenic Statistical Authority (ELSTAT) Processing: <u>NTUA - Road Safety Observatory</u>

#### PTW fatalities by Age and Gender

- Almost 98% of PTW fatalities were males, while on average male fatalities were 80% of total fatalities
- In 2022, almost 47% of killed PTW were aged between 25-49 years old and 23% were aged between 50-64 years old
- 18-24 y.o. riders constitute 19% of PTW fatalities, while the respective EU ratio is 14%

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Notes: 2022 data for CY, CZ, EL, SE, MT; 2021 data for IE; 2020 data for LV Source: CARE database Processing: <u>NTUA - Road Safety Observatory</u>

#### PTW fatalities by Crash Characteristics

- Half PTW fatalities occurred in single vehicle crashes, while the respective percentage for all transport modes is 44%
- ➤ 14% of PTW fatalities occurred at junctions, while the respective rate for all transport modes was 8%
- Most PTW fatalities were recorded during the summer months, at weekends and on Fridays







Source: Hellenic Statistical Authority (ELSTAT) Processing: <u>NTUA - Road Safety Observatory</u>

### PTW Crash Risk, Greece 2003

- Crash risk of moped drivers is 5 times the risk of car drivers, while the risk of motorcyclist drivers is about 10 times the average risk of car drivers
- Young drivers and drivers >65 years old are at increased risk, especially when riding mopeds or motorcycles
- Crash risk of PTW decreases with vehicle age
- Crash risk outside built-up areas at nights or at weekends is much higher, especially for PTW's.

vuilider of toad talaillies der minion vehicie-knomelies	Vumber	of road	fatalities	per million	vehicle-kilometres
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	Driver's age										
Vehicle type	16-17	<b>18-24</b>	25-34	35-44	45-54	55-64	>65	Total			
PTW < 50 cc	54,7	26,7	18,4	45,3	42,5	26,6	357,8	40,1			
PTW > 50 cc	-	202,0	62,3	59,5	30,1	141,9	115,4	77,8			
Passenger car	-	25,2	7,7	6,3	5,3	6,5	11,5	8,0			
Total	•	40,6	11,9	9,3	6,3	7,9	17,0	11,8			

	Vehicle Age									
Vehicle type	< 1 year	1-2 years	3-5 years	6-10 years	> 10 years	Total				
PTW < 50 cc	52,5	32,8	28,0	31,1	12,2	40,1				
PTW > 50 cc	101,3	84,1	62,1	63,4	38,3	77,8				
Passenger car	8,5	8,3	4,5	5,6	13,3	8,0				
Total	15,3	13,8	7,6	7,4	14,3	11,8				

Source: <u>NTUA, 2005</u>Processing: <u>NTUA - Road</u> <u>Safety Observatory</u>

## Helmet Use Rates, 2021

- In 2021, Greece recorded the lowest helmet use rates among PTWs in the EU
- 80% of motorcycle riders and 60% of motorcycle passengers use their helmet
- Helmet use is much lower on urban roads compared to rural roads and motorways in Greece



Rider   Passenger     Irban Roads   75.5% (73.8% - 77.2%)   60.5% (55.9% - 65.0%)     Rural Roads   83.7% (81.1% - 86.3%)   68.7% (61.4% - 76.0%)     Motorways   94.9% (91.7% - 98.0%)   91.7%     Motorways   94.9% (91.7% - 98.0%)   91.7%     Motorways   94.9% (79.0% - 100 mmm)   91.7%     March 2025   Weekend   80.9% (76.2% - 81.9%)   68.2% (51.7% - 68.29						· · · · · · · · · · · · · · · · · · ·
Image: Proban Roads   75.5% (73.8% - 77.2%)   60.5% (55.9% - 65.0%)     Rural Roads   83.7% (81.1% - 86.3%)   68.7% (61.4% - 76.0%)     Motorways   94.9% (91.7% - 98.0%)   91.7%     Motorways   94.9% (79.0% - 100 × 100	Rider Passenge		Passenger			
Rural Roads   83.7% (81.1% - 86.3%)   68.7% (61.4% - 76.0%)     Motorways   94.9% (91.7% - 98.0%)   91.7%     Sotal   80.3 (79.0% - 2   1000 Time Period   KPI (95% Cl)     Rider   Passenger     Koday   68.2% (79.4% - 82.4%)   68.2% (64.0% - 72.4%)     March 2025   Weekend   79.0% (76.2% - 81.9%)   60.0% (51.7% - 68.2%)	Irban Roads	75.5%     60.5%       (73.8% - 77.2%)     (55.9% - 65.0)		<mark>60.5%</mark> (55.9% - 65.0%)	)	
Motorways   94.9% (91.7% - 98.0%)   91.7%     otal   80.3 (79.0% - 2000)   Time Period   KPI (95% Cl)     Rider   Passenger     Weekday   80.9% (79.4% - 82.4%)   68.2% (64.0% - 72.4%)     March 2025   Weekend   79.0% (76.2% - 81.9%)   60.0% (51.7% - 68.2%)	ural Roads	<b>83.7</b> (81.1% -	<mark>%</mark> 86.3%)	<mark>68.7%</mark> (61.4% - 76.0%)	)	
80.3 (79.0% -     Time Period     KPI (95% Cl)       Rider     Passenger       Weekday     80.9% (79.4% - 82.4%)     68.2% (64.0% - 72.4%)       March 2025     Weekend     79.0% (76.2% - 81.9%)     60.0% (51.7% - 68.2%)	lotorways	<b>94.9</b> - 91.7%)	<mark>%</mark> 98.0%)	91.7%		
March 2025   (79.0% -   Immerventod   Rider   Passenger     Weekday   80.9%   68.2%   (64.0% - 72.4%)     March 2025   Weekend   79.0%   60.0%	- <b>4</b> -1	80.3	Time	Devied	KPI (	95% CI)
Weekday     80.9% (79.4% - 82.4%)     68.2% (64.0% - 72.4%)       March 2025     Weekend     79.0% (76.2% - 81.9%)     60.0% (51.7% - 68.2%)	Dlai	(79.0% -	Time P	enou	Rider	Passenger
March 2025 Weekend 79.0% 60.0% (51.7% - 68.2%			Weekd	ay	<mark>80.9%</mark> (79.4% - 82.4%)	<b>68.2%</b> (64.0% - 72.4%
	March 2025		Weeke	nd	<b>79.0%</b> (76.2% - 81.9%)	<b>60.0%</b> (51.7% - 68.2%

## Self-declared behaviour

> 27.7% of Greek motorcyclists and moped drivers reported that they didn't wear a helmet at least once in the last 30 days while the European mean is 24,5%

> 3.7% of Greek PTW riders consider that it is acceptable for a moped rider or motorcyclist not to wear a helmet



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PERSONAL ACCEPTABILITY - MOTORCYCLIST OR MOPED RIDER

Not wear a helmet on a moped or motorcycle

5.9%

8.2%

8.8%

10.0

8,4%

6.9%

7.5

5.5%

5.3%

5.3%

3.8%

3.4%

2.9%

3.2%

Sou Macceptable

2.9%

2.2%

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2.9%

2.4%

2.4%

2.3%

5.2%

5.0%

4.9%

4.7%

4.6%

4.6%

4.4%

4.1%

3.9%

3.8%

3.8%

3.7%

3.3%

3.2%

3.0%

2.2%

2.2%

2.1%

2.1%

#### Other self-declared behaviours by Greek PTW riders

- 12.6% of Greek PTW riders declared that they rode at least once in the last 30 days when they may have been over the legal limit for drink-driving, while the respective European mean is 19.4%
- For riding faster than the speed limits outside built-up areas (not on motorways), the reported percentage for Greece (46.4%) was much higher than European mean (35.1%)
- For riding too fast for road/traffic conditions (e.g. poor visibility, presence of VRUs, etc.), the reported percentage for Greece was 34.7%, while the European mean was 30.3%



## **Problems and Actions**



## PTW riders' behaviour

- The causes of motorcycle crashes could be attributed to:
  - ➤ failure to use defensive driving techniques
  - ➤ failure to follow speed limits
  - > careless/ aggressive behaviour of other drivers
- Low rates of helmet and other protective equipment use by all PTW riders (including e-bikes >25km/h)
- High number of professional PTWs (couriers, deliveries, usually < 125cc) with inappropriate behaviour
- A relative high number of young people riding mopeds or motorcycles without driving license



## Road safety management

#### Insufficient control of traffic violations on:

- helmet use
- riders speeding
- ➤ inappropriate behaviour of drivers
- Lack of proper road infrastructure contributing to PTW safety:
  - inappropriate junction settings (inside urban areas)
  - > lack of proper road markings and traffic signs
  - Iack of appropriate guardrails
- Lack of targeted road safety measures and programmes for PTW safety



#### Road Safety Targets in NRSS 2030 -Road casualties

- 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.
- In addition to the overall target of reducing road fatalities and serious injuries by 50%, two additional targets were set:

	Targets			Targets	s (% reduct	Lives to be saved (annually)		
	Baseline year 2019	2025	2030	Baseline year 2019	2025	2030	2025	2030
Killed Motorcyclists	247	148	84	-	40%	66%	99	163
Cities with zero road fatalities*	9	40	49	-	-	-	85	105



#### Road Safety Targets in NRSS 2030 -KPIs

- Additional targets have been set for eight road safety Key Performance Indicators (KPIs), 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.
- The 2030 target for helmet use is >95%. Moreover, an intermediate target of >85% was set for 2025 (baseline year 2019: 70%).
- Additional targets for helmet use were set for specific road types (urban, rural, motorway) and rider types (front, passenger).



#### Road Safety Measures in NRSS 2030

- PTW riders' safety is included in several road safety actions and measures of all five road safety pillars (management, user, infrastructure, vehicle, post crash care).
- Specific measures concerning PTW riders' safety: M8.3 Road Safety Action Plan for Motorcycles B7.1 Helmet use
  B7.4 PTWs' safety equipment
  V2.4 Technical Inspection of Mopeds
  V3.6 VRUs' detection systems in trucks
  V4.3 Motorcycle protection systems



# Necessary actions for the safety of PTWs and urban areas (1/2)

#### Increase of helmet use

- Increase of traffic controls on helmet use (especially inside urban areas)
- Awareness campaigns

#### Improvement of PTWs' behaviour

- Improvement of education and driving licence exams
- Lifelong training / awareness of PTWs
- Improvement of professional PTWs' behaviour (couriers, deliveries)
- Increase of controls on speeding and driving without licence

#### Improvement of urban road safety

Speed management

areas

- Setting lower speed limits (30km/h)
- Public transport and active mobility promotion
- Traffic calming measures

#### Lifelong training / awareness of other drivers on their behaviour towards PTWs and other VRUs inside urban



# Necessary actions for the safety of PTWs and urban areas (2/2)

- Revision of the institutional framework for the management of the traffic violations
- Development of an integrated system for the management of traffic violations
- Road infrastructure interventions (low speed zones, more space to active mobility users, use of bus lanes, PTW advance stop lines, intersections, etc.)
- Development and implementation of an integrated road safety policy for PTWs and urban areas
  - > Target setting and selection of specific measures
  - Systematic monitoring of the measures' implementation and of the targets
  - Strengthening road safety management within the local Authorities



## **Concluding Remarks**



### Conclusions

- The rate of PTWs' fatalities in road crashes, and especially inside urban areas, is especially high in Greece, leading to the high need for further measures to be taken
- Need for an integrated action plan focusing on the reduction of PTW crashes comprising:
  - Systematic traffic law enforcement
  - Adjustment of road infrastructure
  - Setting lower speed limits inside urban areas
  - Improvement of driving licence system
  - > Incentives for acquiring protective equipment
  - Equivalences between motorcycle driving licences
- Development of road safety culture not only for drivers and riders, but also for the Authorities involved in the design, implementation and monitoring of PTW and urban road safety policies Challenges for Power-Two Wheelers and Urban Roads Safety in Greece, March 2025









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## Challenges for Power-Two Wheelers and Urban Roads Safety in Greece



together with Katerina Folla, PhD Candidate



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