

Safe Driving in Practice

George Yannis

NTUA Professor

Together with:

Eva Michelaraki, Research Associate

Department of Transportation Planning and Engineering
National Technical University of Athens



Road Safety Awareness Event
Andriaki Shipping Co. Ltd.

Athens, 23 October 2026



Andriaki Shipping Co. Ltd.

Outline

1. NTUA Road Safety Observatory (1)
2. Basic Figures of Road Safety (6)
3. Key Traffic Safety Advices (18)
4. New Road Traffic Code in Greece (2)
5. Conclusions (2)





NTUA Road Safety Observatory

NTUA Road Safety Observatory

- The NTUA Road Safety Observatory (www.nrso.ntua.gr) is a **Center of Research and Innovation Excellence on Road Safety**, with global recognition [ranked: 4th in Europe and 45th worldwide ([PubMed](#) 2023), 2nd in Europe and 6th worldwide ([AAP](#) 2019)]
- A **Team of 40+ Scientists**: internationally recognized Professors, Senior Transportation Engineers, PostDoc, PhD Candidates and other scientists
- An **international reference website** - information system with state-of-the-art road safety data and knowledge:
 - more than 30.000 visits per month,
 - 168 electronic newsletters since 2007,
 - tens of tweets and social media posts annually,
 - network of more than 5.500+ road safety experts in Greece (1.500+) and worldwide (4.000+).
- An excellent **research activity**:
 - More than 215 Diploma Theses & 28 PhD Theses,
 - More than 190 road safety research projects, mostly highly competitive,
 - More than 1.100 road safety publications (300 in scientific journals),
 - More than 180 scientific committees,
 - International Cooperations: European Commission, UN/ECE, OECD/ITF, WHO, World Bank, EIB, CEDR, FEHRL, ERF, IRF, UITP, ETSC, WCTR, TRB, decades of Universities and Research Centers.





Basic Figures of Road Safety

Key Road Safety Figures (2025)

- Road traffic crashes consist a major social problem worldwide, **causing 1.19 million road traffic deaths** and more than 50 million road injuries each year
- Road traffic injuries are the **leading cause of death** for children and young adults aged 5-29
- The cost of road traffic crashes to society and the economy is estimated to be **more than €10 billion** per year

	Greece	Europe	Worldwide
Deaths	517	19.400	1,16 million
Injuries	13.297	1.500.000	20-50 million
Crashes	11.024	1.300.000	



What does it mean?



1,19 million = 3.500 air crashes per year

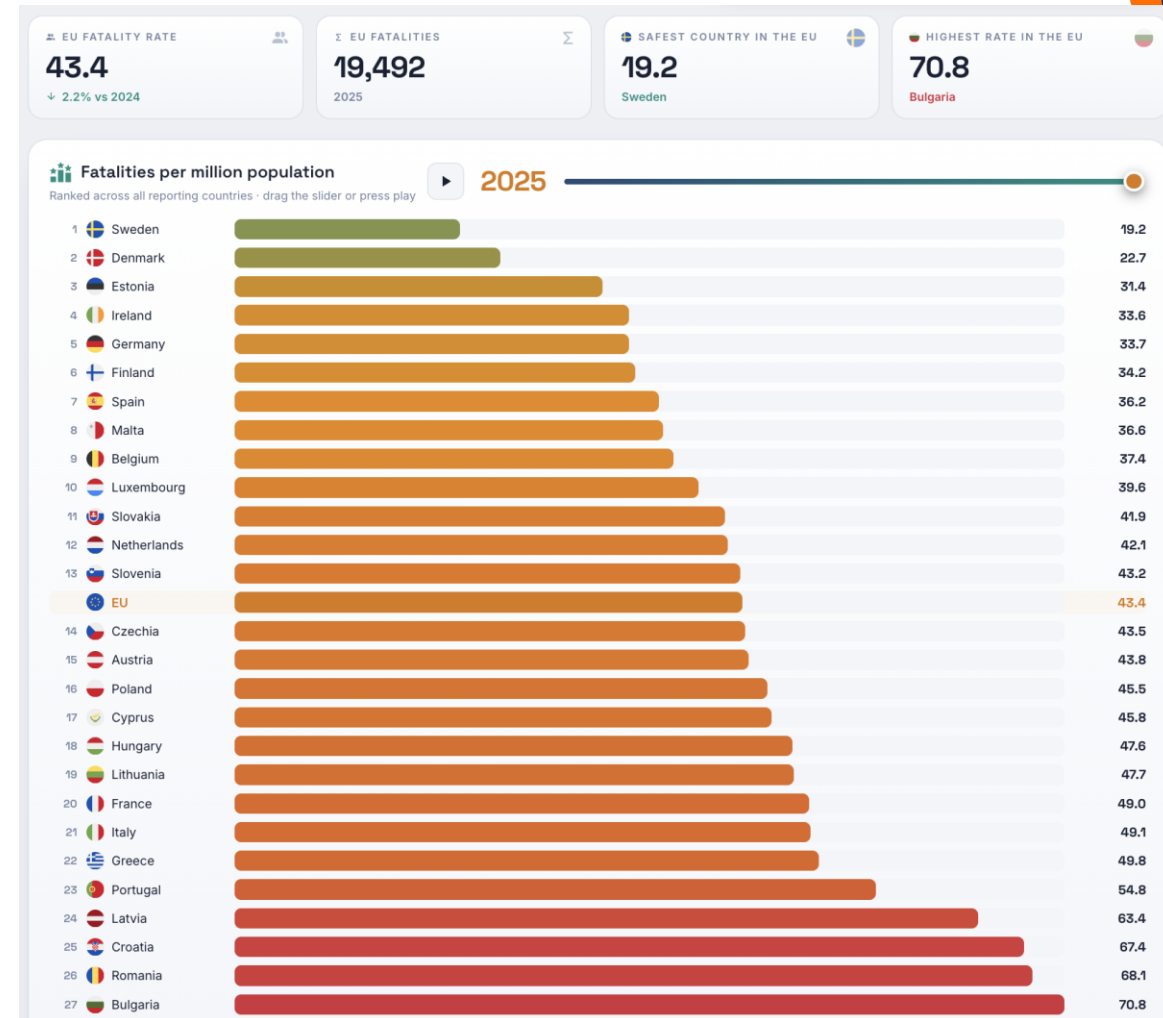
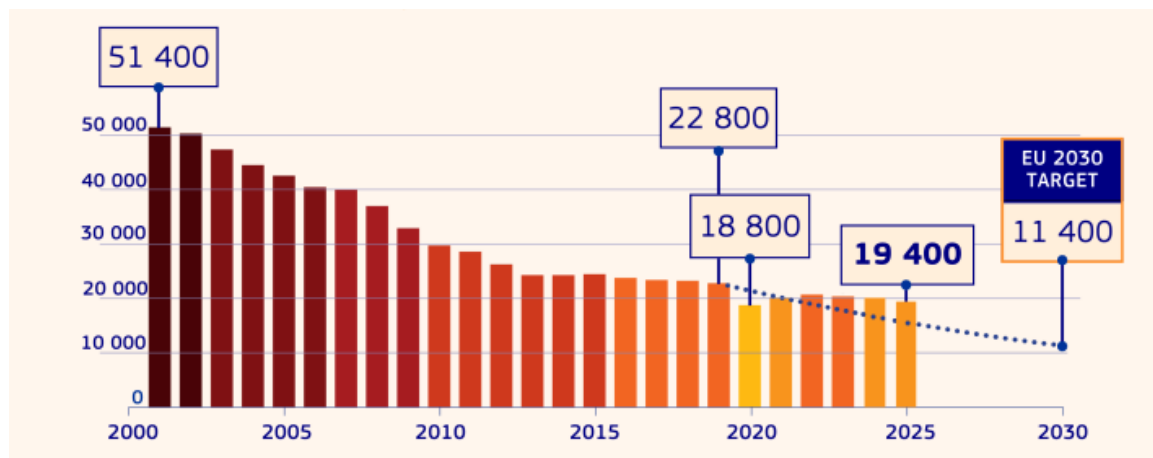
Basic Road Safety Figures in European Union, 2025

Greece consistently has **poor road safety performance**:

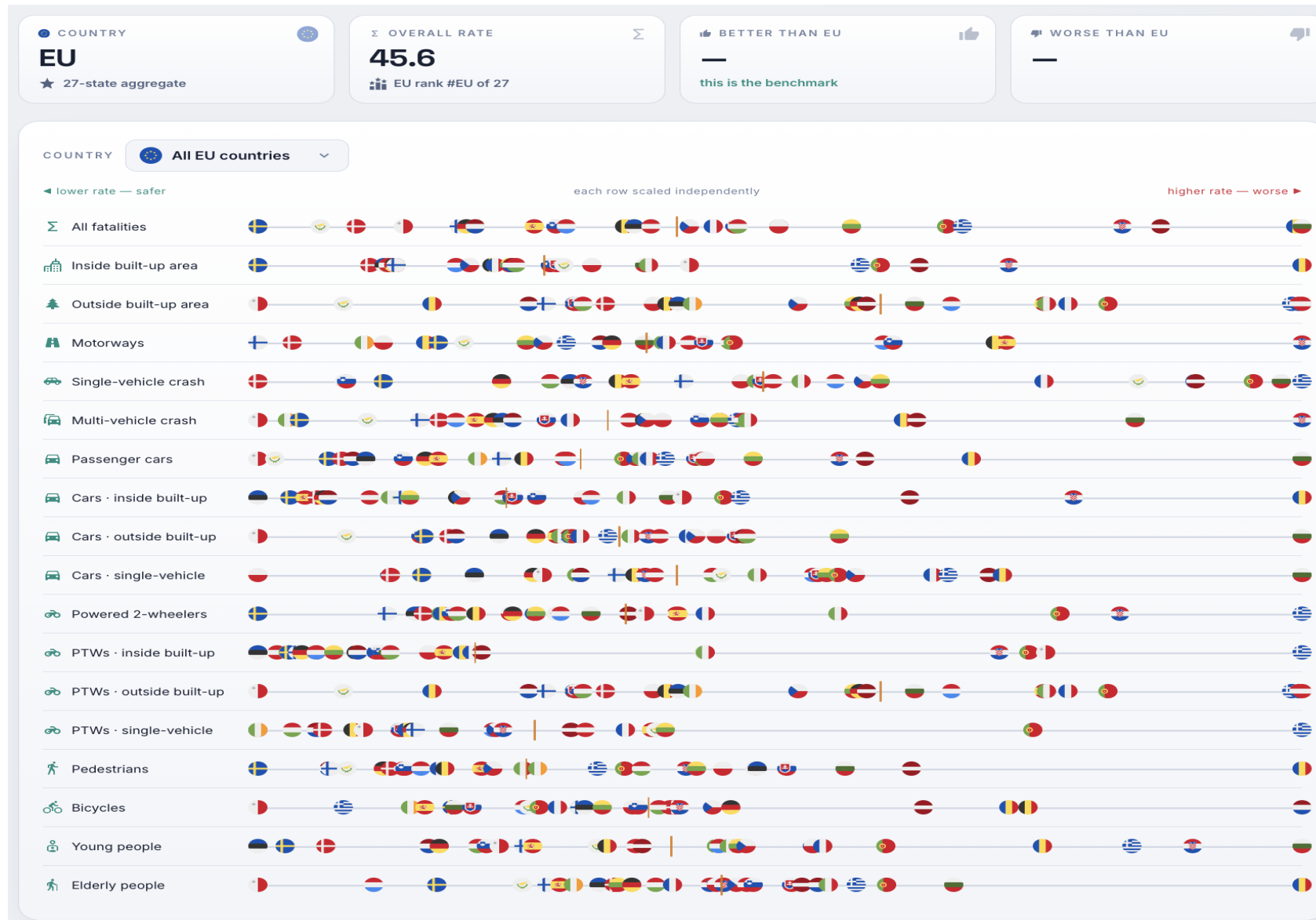
- **22nd place out of the 27 EU** Member States (2025)
- 49.8 fatalities per million inhabitants (EU average: 43.4, best in the EU: 19.2)

Number of EU road deaths 2001-2025

Source: CARE

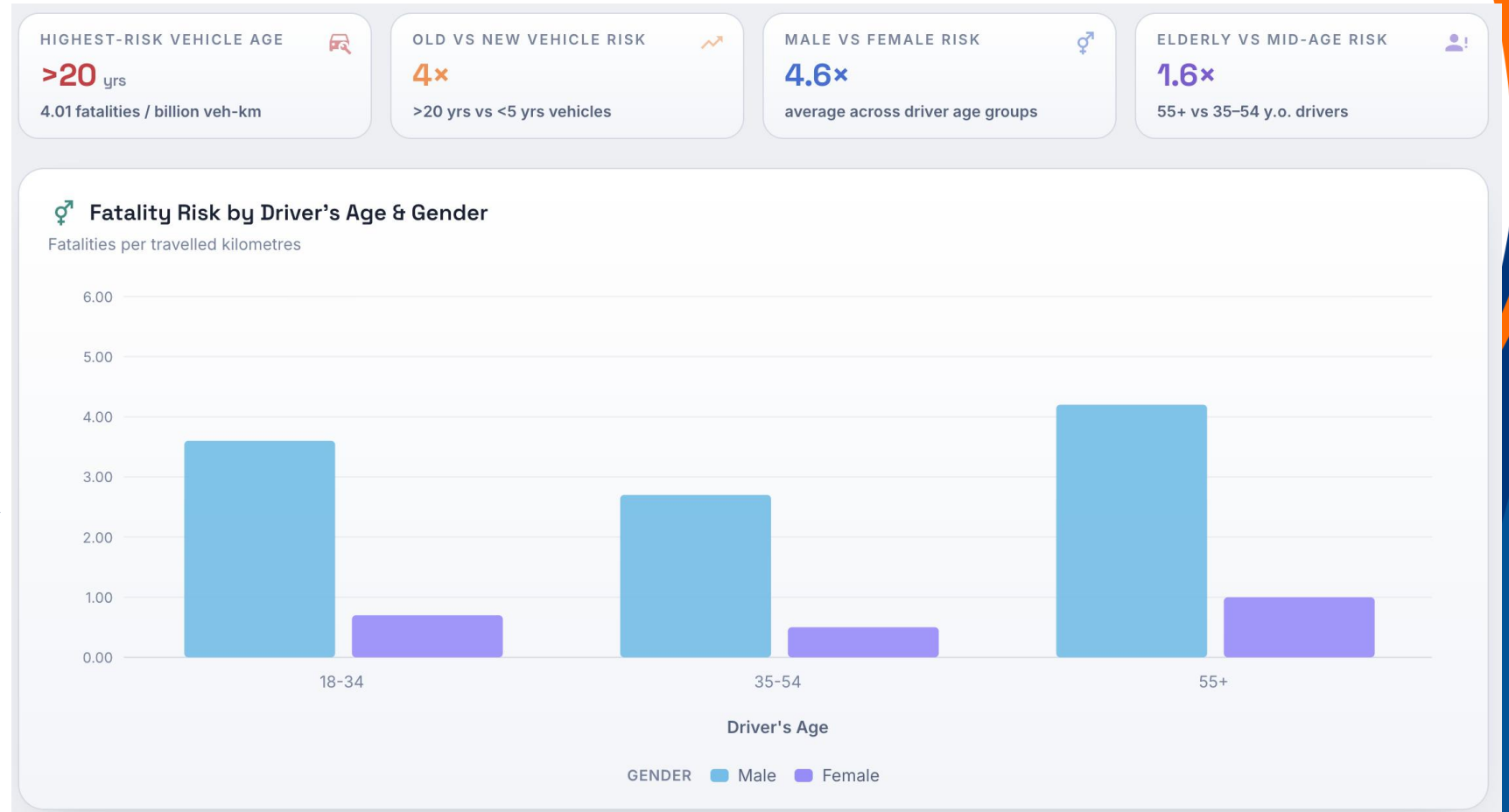


Fatalities by Road Crash Type in European Union, 2023



Driver Risk Indicators in Greece, 2022

- Male drivers show a **significantly higher** number of road deaths per km driven than women, across all age groups
- Drivers **aged 55 and over** show the highest number of road deaths per km driven, while drivers aged 35-54 show the lowest
- Younger drivers (**18-34 years old**) also record an elevated risk index



Risk Exposure Indicators in Greece, 2022

- The highest risk index is observed in passenger **vehicles aged over 20 years** → about **4 times higher** compared to newer passenger vehicles
- In the **15-19 year vehicle age category**, more road deaths per km driven are observed across all driver age groups

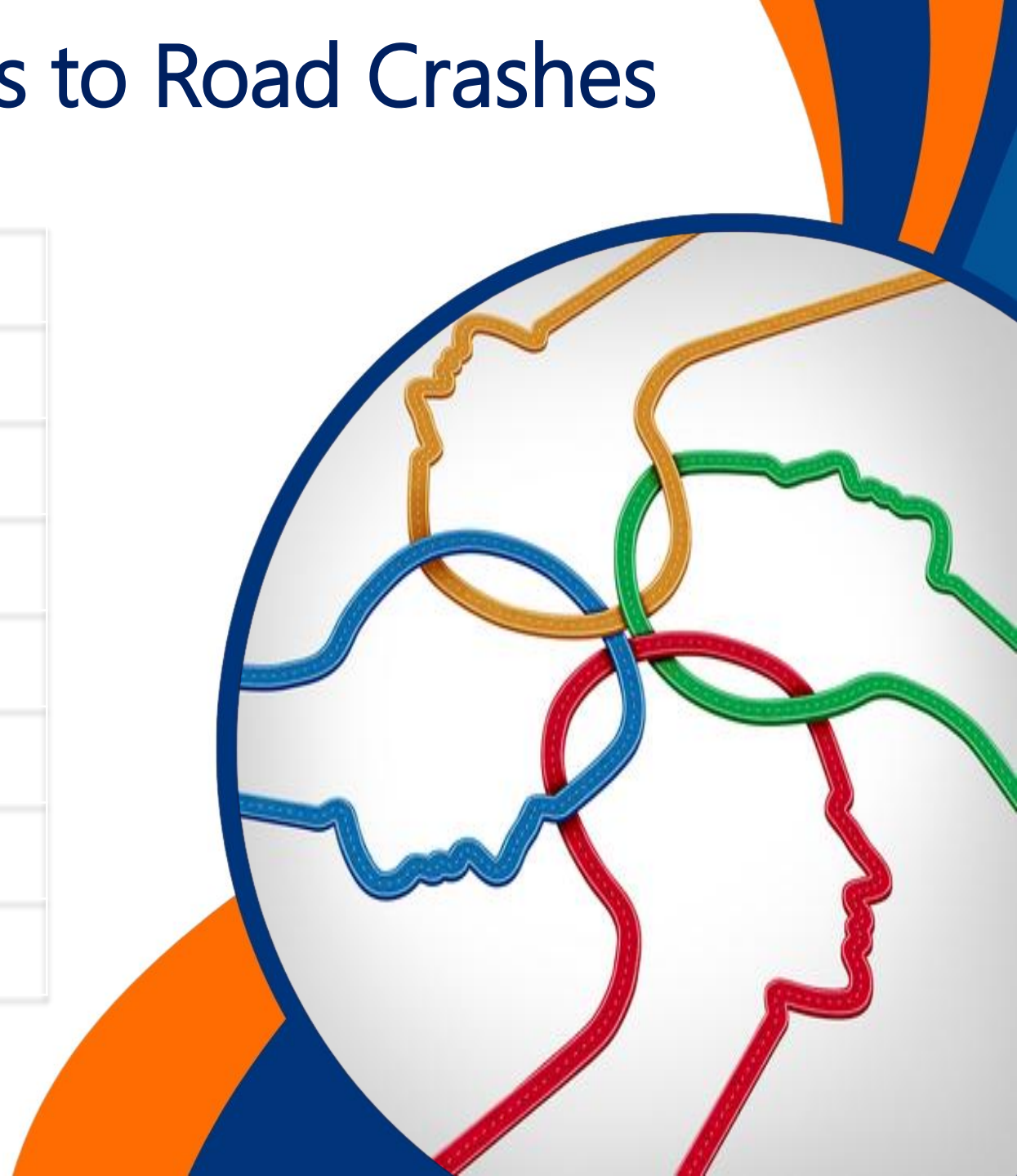




Key Traffic Safety Advices

Contribution of the 3 Factors to Road Crashes

Human only	65%
Human & Road	24%
Human & Vehicle	4.5%
Human, Road & Vehicle	1.25%
Road only	2.5%
Road & Vehicle	0.25%
Vehicle μόνο	2.5%
TOTAL	100%



Recommendations for Safe Driving

www.nrso.ntua.gr/advice

- At **lower speeds**, I avoid crashes
- I wear the **seat belt** to avoid injuries
- I wear the **helmet** to protect myself in case I fall
- I hold the steering wheel and not the **mobile phone**
- When I have been **drinking**, someone else drives
- If I am **tired**, I don't drive
- I drive carefully in **adverse weather conditions**



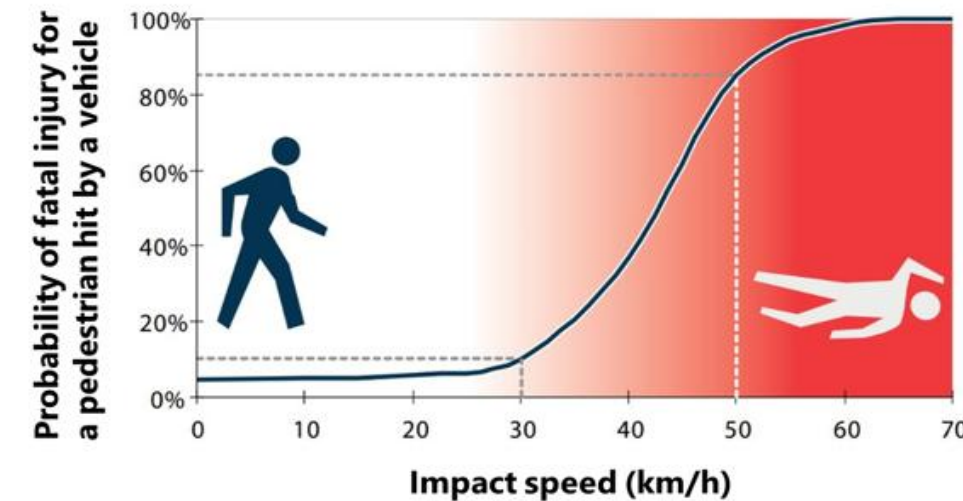
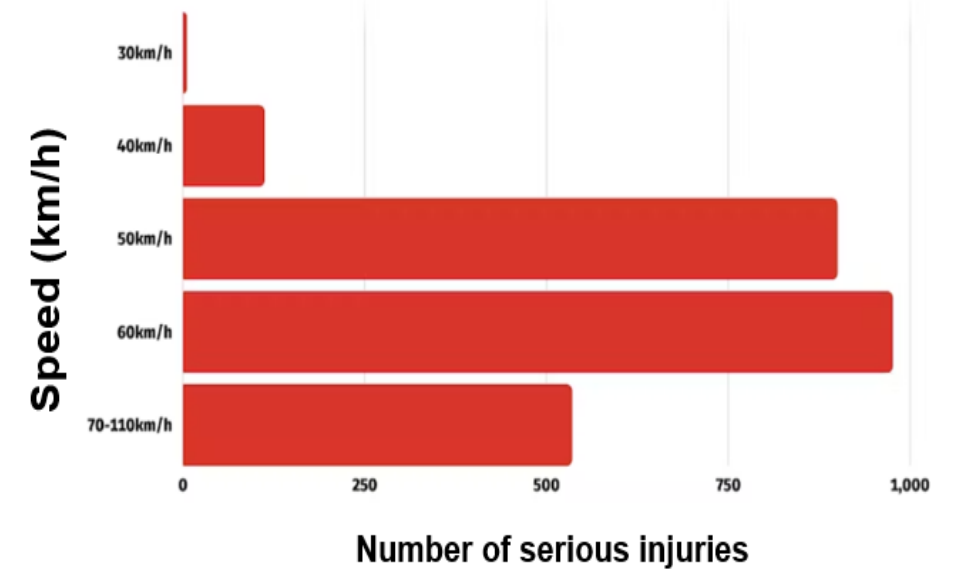
At lower speeds, I avoid crashes

- Speeding is the **number one cause** of road crashes worldwide
- Speeding not only **increases the likelihood of a crash**, but also the likelihood of serious injury or death from a crash
- Driving at lower speeds would help prevent the majority of crashes and **reduce the number of deaths and injuries**, especially in cities where pedestrians, cyclists and motorcyclists are highly exposed and vulnerable in case of a collision (70% of deaths in urban areas are vulnerable road users)
- Speeding encompasses: **excessive speed** (driving above the speed limit) and **inappropriate speed** (driving too fast for the conditions, but within the limits)



Why speeding is dangerous?

- When speed increases, the risk of a **crash and of its severity** increases as well
- A 5% increase in average speed leads to approximately a 10% increase in all **injury crashes** and a 20% increase in **fatal crashes**
- **Pedestrian fatalities** increase from 10% in 30km/h collisions to 90% in 50km/h collisions
- Higher speeds **increase the distance travelled during the driver's perception** and reaction time, as well as the distance required for emergency braking
- Drivers exceeding the speed limits are more likely to lose control of the vehicle, have **less time to respond to potential hazards** and experience more severe consequences from driving errors



Impacts of 30km/h Speed Limit in Cities

Yannis, G., & Michelaraki, E. (2024). Review of City-Wide 30 km/h Speed Limit Benefits in Europe Sustainability, 16(11), 4382

City-wide 30km/h speed limits led to **average reduction:**
(meta-analyses of 70 studies from 17 cities)



Benefits of City-wide 30 km/h Speed Limit

Yannis, G., & Michelaraki, E. (2024). Effectiveness of 30 km/h speed limit – A literature review. Journal of Safety Research, Vol. 92, November 2024

Road safety

- decrease average travel speed
- decrease conflicts with VRUs

Environment

- reduce air pollution
- reduce car dependency

Traffic flow

- reduce traffic volumes
- reduce congestion

Sustainability

- increase Public Transport use
- increase pedestrian, cyclists and e-scooter active mobility

Energy

- reduce fuel consumption
- promote smoother eco-driving

Key Resources



Setting a speed limit of 30 km/h where people and traffic mix, make streets
safer, healthier, greener and more liveable



I wear the helmet to protect myself in case I fall

- A safety helmet **significantly reduces rider's injuries** in the event of a motorcycle or bicycle collision, offering additional protection against impact and friction to the head
- Motorcycle helmets can reduce fatal crashes **by around 40%** and the chance of severe head injury by almost 70%
- Similarly, bicycle helmets can reduce fatal injury to the head or brain by 71% on average
- Wearing a helmet lowers the risk of serious injuries to the **head, brain and neck**
- Helmets absorb the **energy of an impact**, reducing the force transmitted to the brain
- Helmet use is **effective** at both low and high speeds



Why not wearing a helmet is dangerous?

- Not wearing a helmet significantly **increases the risk of head and brain injury** for riders
- In some cases, not wearing a helmet can lead to permanent **disability or death**
- Facial injuries are also more common among **open-face helmets users**
- Riders should make sure that the helmet **fits snugly** on their head and doesn't move around
- The strap should be **fastened tightly under the chin**, without causing discomfort
- Riders should also **regularly check the condition** of their helmet, if it is damaged or worn, replace it



I wear the seat belt to avoid injuries

- Seat belts are an **effective way** of reducing the number of road deaths and severe road injuries in crashes
- In particular, seat belts are shown to **reduce the risk of fatal incidents by 60%** for occupants in the front of a vehicle and 44% for those in the rear
- For **child restraint systems**, research shows that children who are correctly restrained are around 60% less likely to be killed or injured compared to unrestrained children
- Failure to wear a seat belt is the **2nd leading cause** of road death, after speeding
- European Commission suggests that action targeting the use of seat belts could save up to **7.300 lives a year in the EU**



Why not wearing a seat belt is dangerous?

- Not wearing a seat belt can result in being totally **ejected from the vehicle in a crash**, which is almost always deadly
- The **air bag can seriously injure** or even kill you if you're not wearing a seat belt
- Air bags are designed to work with seat belts, **not replace**
- Passengers who are not wearing seat belts at the time of a collision account for the **majority of occupant road traffic fatalities**
- Seat belts are the **best defense against impaired**, aggressive and distracted drivers
- Being buckled up during a crash helps keep you **safe and secure** inside your vehicle



When I have been drinking, someone else drives

- Driving under the influence of alcohol and any psychoactive substance or drug increases the risk of a crash that **results in death or serious injuries**
- About **25% of all road fatalities in Europe** are alcohol related whereas about only 1% of all kilometres driven in Europe are driven by drivers with 0.5 g/l alcohol in their blood or more
- Approximately **1 in every 10 seriously injured** drivers is estimated to have used drugs; about half of these casualties have also used alcohol
- As the **Blood Alcohol Concentration** (BAC) in the driver increases, the crash rate also rises. It has been estimated that **1.5 to 2% of the kilometres driven** in the EU are done so by someone with illegal BAC
- Compared to a sober driver, the crash rate of a driver with a BAC of 0.5 g/l (which is the legal limit in Greece) is **1.8 times higher than of sober drivers**
- When a driver has a BAC of 1.5 g/l his crash rate is **22 times that of a sober driver** while, the crash rate for fatal crashes is about 200 times that of sober drivers



Why the driving under the influence of alcohol or drugs is dangerous?

- Drivers under the influence have divided attention, far less muscle control than normal and **clear deterioration of reaction time and control**
- Driving under the influence of alcohol or drugs can lead to **reduced response to emergency driving situations**, reduced ability to maintain lane position and poor coordination
- Alcohol- or drug-impaired driving can significantly **reduce a driver's ability to process information**, detect signals, search the visual environment and accelerate or brake appropriately
- Of all illegal drugs, the risk is greatest - **at least 5 times higher** - if someone has taken amphetamines, multiple drugs, or alcohol combined with drugs



I hold the steering wheel and not the mobile phone

- Driver distraction is a process or condition that draws the driver's attention away from the task of driving
- Distracted drivers **aren't just a threat to themselves**: they are a danger to everyone else on the road. Mobile phone is symbolic of 'distraction in traffic'
- Texting (and navigating on the phone) is the **most alarming distraction**
- Car drivers are engaged in distracting activities for about **half of all driving time**
- Drivers and pedestrians should **first and foremost be focused on traffic**
- Distracted driving encompasses: **reading and sending text messages** and typing or updating a social network site
- Nearly **one in three European drivers** admits to having used a handheld mobile phone for conversation, and nearly one in four admits to having done so to check texts or social media



Why distracted driving is dangerous?

- Using a mobile phone while driving **creates enormous potential** for deaths and injuries on roads
- Distracted drivers can swerve/zigzag more, **have longer reaction times**, and often miss information from the traffic environment, including other road users
- Distracted driving leads to worse **braking reaction time** and reaction to traffic signals
- Distracted drivers can also have difficulty in **keeping the correct lane or headway distance**
- Drivers using mobile phones are approximately **4 times more likely** to be involved in a crash than drivers not using a mobile phone
- Sending or reading a text **takes your eyes off the road for 5 seconds**. At 80kph, that's like driving the length of an entire football field with your eyes closed



If I am tired, I don't drive

- Driving fatigue is a **major factor in 10-20% of road crashes**, not only due to long hours of driving, but also due to other factors such as lack of sleep, stress or time of day
- Although **sleepiness and fatigue** may have different causes, their effects on performance and motivation are similar, a decrease in mental and physical functioning
- When fatigued, persons may **alternate normal functioning with short lapses** in performance (i.e. not noticing or responding to signals)
- The **long-term result** of fatigue is an increasing variability of performance



Why fatigue is dangerous?

A fatigued driver is more likely to:

- **lose control** of the vehicle
- have **less time to react** proactively
- have less **accurately reaction to deceleration** by the driver in front
- have **difficulty in keeping the vehicle** in the lane



I drive carefully in adverse weather conditions

- Weather is an **environmental risk factor** that affects collision and casualty rates
- Weather conditions partly **determine the road conditions** and the driver's behaviour
- **Adverse weather encompasses:** fog or mist, rain, snow, sleet, hail, strong wind, and high temperatures
- In Europe, 1% of **total road crash fatalities are due** to fog, mist or smoke, 11% by rain, 0.9% by snow and 0.4% by strong wind



Why driving in adverse weather is dangerous?

- **Vehicle contact with the road.** The more rain, snow, or hail falls, the less the friction of the road surface (lower ability to brake and control the vehicle)
- **Reduction in visibility,** due to fog or the reflection of the sunlight by the wet road surface
- **Behavioural changes** such as more cautious driving
- **Gusts of wind** can push relatively high vehicles
- **Emotions rise with the temperature,** people are more irritable to others, they get tired, lose their concentration and their reaction time increases





New Road Traffic Code in Greece

A New Road Safety Culture in Greece with the New Road Traffic Code (2025)

- **rationalising and simplifying penalties**, linking them to the seriousness & magnitude of offences
- **punishing drivers instead of vehicles**, especially recidivists
- deployment of **3.000 cameras** for key violations (speeding, helmet, seatbelt, mobile use)
- introduction of **digital management of fines**
- **30km/h speed limit** in all urban streets in Greece, of one or two directions with one lane per direction – the second EU country after Spain (from 1 January 2026)
- introducing two-wheeler **filtering & advance stopping zones**



Greece's best-ever Performance in 2025

- **Lowest number of fatalities since ever**
highest annual percentage decrease (-22%)
- **148 lives saved in 2025**
517 in comparison to 665 in 2024
- **Mainly due to:**
 - systematic enforcement of helmet wearing & drink-and-drive
 - the new Road Traffic Code in Greece
- **Helmet use increased from 80% to 92%**
resulting in 75 lives of motorcyclists saved
- **Proud of NTUA persisting advocacy**
at the Authorities and the media





Conclusions

Road Safety @ the crossroads

- **Speeding is a major global health issue**
 - its role is largely underestimated by all
 - city-wide 30km speed limits is the **key measure** against speeding, with high impact, especially for VRUs' lives
 - need for **European (even global) rule**, like for smoking and alcohol, for of city-wide 30km speed limits
- **Safety should be embedded into urban mobility policy**
 - public transport is the best road safety measure
 - safety starts with the right public space management
 - safer speeds should prevail over traffic efficiency



City-wide 30km/h Speed Limits boost a New Road Safety & Mobility Culture

- City-wide 30km/h speed limit is the since-long waited single road safety measure with **such a significant benefit at such a low cost** and such a small change in our habits
- More than a simple new traffic rule: a catalyser for slower and safer traffic, for **a new road safety and mobility culture**



Safe Driving in Practice

George Yannis

NTUA Professor

Together with:

Eva Michelaraki, Research Associate

Department of Transportation Planning and Engineering
National Technical University of Athens



Road Safety Awareness Event
Andriaki Shipping Co. Ltd.

Athens, 23 October 2026



Andriaki Shipping Co. Ltd.