



National Technical University of Athens  
Road Safety Observatory

[www.nrso.ntua.gr](http://www.nrso.ntua.gr)



European Transport Safety Council

# The NTUA Road Safety Observatory



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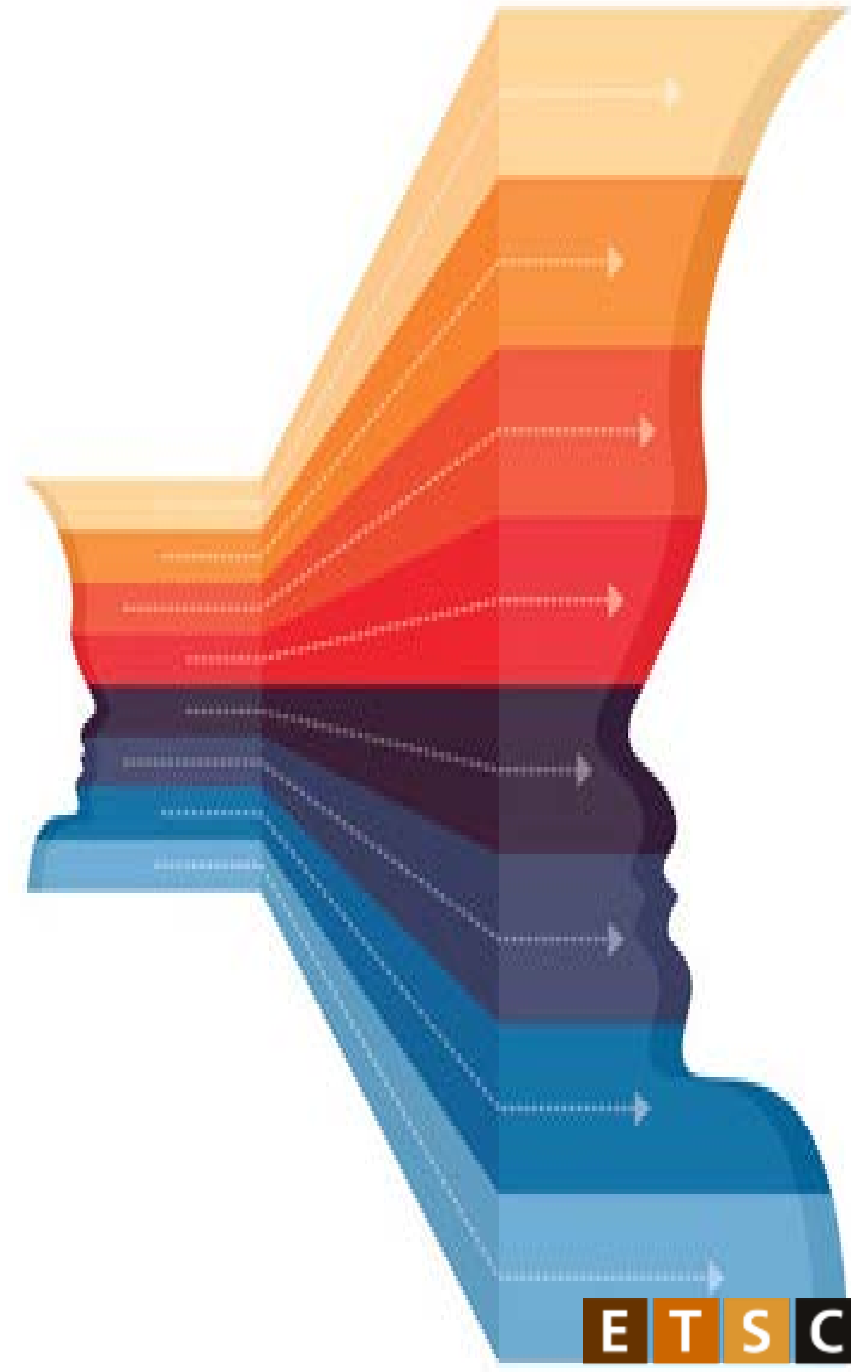
**George Yannis**

Professor

Brussels, 10 October 2019

# Presentation outline

1. The NTUA Road Safety **Observatory** (10)
2. **Cooperations** and Partners (5)
3. NRSO **Website** and Systems (4)
4. Road Safety **Research Areas** (6)
5. Road Safety Research **Perspectives** (4)





# NTUA Road Safety Observatory

## A Center of Research and Innovation Excellence





# NTUA Road Safety Observatory

- A **Center of Research and Innovation Excellence on Road Safety, with global recognition** [ranked: 2nd in Europe and 6th worldwide (AAP 2018)]
- within the **Department of Transportation Planning and Engineering** [ranked: 9th in Europe and 39th worldwide (ShanghaiRanking's 2017), scientific citations: 3rd in Europe and 19th worldwide (Pulse 2017)]
- of the **School of Civil Engineering** [ranked: 11th in Europe and 42nd worldwide (QS 2018)]
- of the **National Technical University of Athens** [the oldest (since 1837) and most prestigious Greek Technical University]



# NRSO - Mission

The Mission of the NTUA Road Safety Observatory ([www.nrso.ntua.gr](http://www.nrso.ntua.gr)) is:

- to support the Greek and the International Road Safety Community with current **key road safety knowledge and data**
- gathered, analysed and organised within the **research activities** of the Department of Transportation Planning and Engineering of the School of Civil Engineering of the National Technical University of Athens
- as well as within **co-operations** with various national and international road safety organisations



# NRSO - Vision

The Vision of the NTUA Road Safety Observatory is:

- to contribute to the **significant reduction of the number of road accidents** and of the related casualties in Greece, in Europe and worldwide
- through the scientific support of **evidence based decision making** for the necessary road safety policies, programmes and measures





# NRSO - The People

- Internationally recognized Professors
- 6 Senior Transportation Engineers (4 PostDoc)
- 6 Transportation Engineers - PhD Candidates
- 6 Transportation Engineers - Research Assistants
- 2 Information Systems Engineers
- 2 Administrative Assistants

with high level scientific expertise in:

- traffic safety, transport and traffic planning and engineering
- data science and advanced statistical data analysis
- intelligent transportation systems and automation

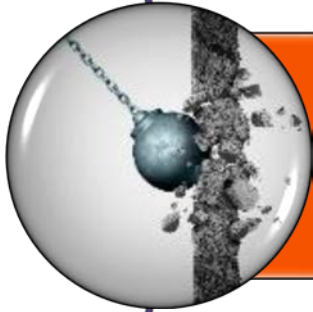


# NRSO – Our Fundamental Research Principles



## Excellence

- Advanced and innovative technology concepts



## Impact

- Research with significant impact to society and economy



## Implementation

- State-of-the-art organisation and management structures



# NRSO - The Value of the Researcher

We are committed to the Value of the Researcher, which:

- starts with carrying out **excellent research**,
- is tested by publishing in high-level **peer review journals** and
- makes the difference when **awarded project grants** through highly competitive procedures



# NRSO - Research Performance

- More than **100** road safety research projects since early '90s
  - 40 Greek
  - 60 International
- **71** of these research projects were assigned through **highly competitive** (national or international) procedures
  - Horizon 2020: **7 projects** out of 35 proposals submitted





# NRSO - Scientific Publications

- More than **500 road safety publications**:
  - in scientific Journals (more than 150)
  - in scientific conference proceedings (more than 350)
  - with more than 3.000 citations
  - i10-index: google scholar: 83
  - h-index: google scholar: 29, scopus: 22
- More than **350 presentations** in scientific conferences
  - more than 250 international and more than 100 national
  - after invitation in more than 150 of them

Available on-line at: [www.nrso.ntua.gr/geyannis](http://www.nrso.ntua.gr/geyannis)



# NRSO - Road Safety PhDs

## ➤ Dimitris Tselentis, 2018

- "Benchmarking Driving Efficiency using Data Science Techniques applied on Large-Scale Smartphone Data"

## ➤ Dimosthenis Pavlou, 2016

- "Traffic and safety behaviour of drivers with neurological diseases affecting cognitive functions"

## ➤ Akis Theofilatos, 2015

- "An advanced multi-faceted statistical analysis of accident probability and severity exploiting high resolution traffic and weather data"

## ➤ Panagiotis Papantoniou 2015

- "Risk factors, driver behaviour and accident probability - The case of distracted driving"

## ➤ Eleonora Papadimitriou 2010

- "Pedestrian behaviour and safety models in urban road networks"

## ➤ 9 more PhDs are in progress





# NRSO - PhD & PostDoc Alumni Careers

Our **PhD and PostDoc Alumni** Engineers are pursuing excellent academic, engineering and consulting careers worldwide:

- Technical University of Munich (**TUM**)
- Technical University of Delft (**TUD**)
- Ecole Nationale des Ponts et Chaussées (**ENPC**)
- Ecole Polytechnique Fédérale de Lausanne (**EPFL**)
- Loughborough University (**UL**)
- National Technical University of Athens (**NTUA**)
- Ernst & Young (**EY**)
- Salfo Engineering International (**Salfo**)



National Technical  
University of Athens



**EPFL**



# Cooperations and Partners





# Our Cooperations - Greece



# Our Cooperations - Europe

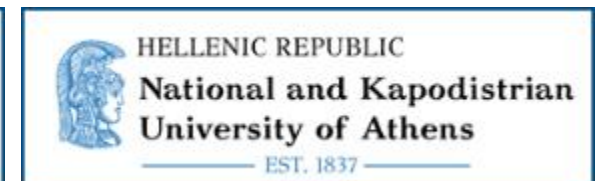
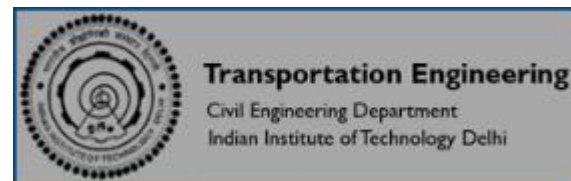


# Our Cooperations - Worldwide





# Our Partners - Universities



# Our Partners - Research Institutes





# NRSO Website and Systems





# The NRSO website (1/2)

An international reference website - information system with state-of-the-art road safety data and knowledge

[www.nrso.ntua.gr](http://www.nrso.ntua.gr)

- more than **3.000 visits per month**
- **95 electronic newsletters** since 2007
- **tens of tweets** and social media posts annually
- network of more than **3.000+ road safety experts** in Greece (800+) and worldwide (2.200+)

The screenshot displays the NRSO website interface. At the top, the header includes the National Technical University of Athens (NTUA) logo and the text 'Road Safety Observatory'. Navigation links for 'Home', 'About', 'Knowledge', 'Data', 'Conferences', 'News', and 'Links' are visible. The main content area is divided into several sections:

- Systems:** A vertical sidebar on the left lists various systems including SafeFITS, European Road Safety Observatory, AfricaRoadSafety Observatory, pract-repository, and DaCoTA Road Safety Knowledge System.
- Europe on the Move:** A featured article titled 'New safety features in your car' with sub-points: 'Improved direct vision for trucks and delivery of goods vans and cyclists', 'Safety plans in case of a crash for pedestrians and cyclists', 'Event data recorder', and 'Awareness and in-vehicle monitoring'. It mentions the 'European Commission - Breakthrough Revised General Safety Regulation, 2019'.
- Safety assessment of control design parameters through vehicle dynamics model, 2019:** A detailed article featuring a book cover titled 'SAFETY ANALYSIS & PREVENTION' and text describing a paper by Stergios Mavromatis, Alexandra Laiou, and George Yannis. It discusses the use of a vehicle dynamics model to define design parameters for steady-state cornering conditions.
- Cooperations:** A section listing various international organizations and forums, including the International Transport Forum, UNECE, World Health Organization, The World Bank, and CEDR.
- Upcoming Events:** A section on the right side of the page listing various events, including 'Digitalisation and Road Safety Research', 'SAFETY DESIGN SAFETY CITIES', and '28th Meeting of the International Traffic Safety Data and Analysis Group (IRTAD), Paris, 2019'.
- Subscribe to our Newsletter:** A section at the bottom right with the ETSC logo and the text 'European Transport Safety Council'.



# The NRSO website (2/2)

A dynamic website with a wealth of information

[www.nrso.ntua.gr](http://www.nrso.ntua.gr)

- since 2004 with more than **1.300 items**
- all important road safety **News** in Greece, in Europe and globally
- new **Reports** covering all modern road safety issues
- latest available road safety **Data** for Greece and the EU
- exhaustive list of road safety **Conferences** in Greece and globally
- links to dozens of road safety **Resources** globally

The screenshot shows the NRSO website interface. At the top is the header for the National Technical University of Athens Road Safety Observatory, with navigation links for Home, About, and Knowledge. Below the header is a 'Systems' section with logos for SafeFITS, European Road Safety Observatory, Africa Road Safety Observatory, pract-repository, and DaCoTA. A 'Cooperations' section follows with logos for the European Union, Research & Innovation, International Transport Forum, UNECE, World Health Organization, The World Bank, and the European Investment Bank. The main content area is titled 'Road Safety Conferences' and includes a photograph of a conference. Below the photo, it lists conferences for 2020 and 2019. The 2020 list includes the 7th ICTTP, Symposium for Highway Geometric Design, Transport Research Arena (TRA) 2020, and the 3rd Global High-Level Conference on Road Safety. The 2019 list includes New Horizons of Transport and Communications, Annual POLIS Conference, 8th International Cycling Safety Conference, Road Safety in Local Communities, 32nd ICTCT Conference, 9th ICTR, 26th ITS World Congress, International Conference on Road Safety & Simulation, 47th European Transport Conference, World Road Congress Abu Dhabi, EU-Safety 2019, Prevention of Accidents at Work (WOS), 24th Living and Walking in Cities Conference, IRCOB Conference 2019, Transportation Systems of the Future - Mobil.TUM, 8th Symposium - hEART2019, 22nd International Council on Alcohol, Drugs, Traffic, and the 8th Symposium on Naturalistic Driving Research. At the bottom right is the ETSC logo.

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Road Safety Observatory

Home About Knowledge

Systems

SafeFITS  
The Global Road Safety Model

European Road Safety Observatory

Africa Road Safety Observatory

pract-repository

DaCoTA Road Safety Knowledge System

Cooperations

MOBILITY AND TRANSPORT

RESEARCH & INNOVATION

International Transport Forum

UNECE

World Health Organization

THE WORLD BANK

European Investment Bank

Road Safety Conferences

Road Safety Conferences concern past and future Conferences, Congresses, Seminars and Workshops in the field of road safety in Greece, in Europe and worldwide, in which we participate or we are aware of through our cooperations.

2020

- 7th ICTTP, VTI & SAFER, Gothenburg, 25-27 August
- Symposium for Highway Geometric Design, Amsterdam, 28 June -01 July
- Transport Research Arena (TRA) 2020, Helsinki, 26-30 April
- 3rd Global High-Level Conference on Road Safety, Stockholm, 19-20 February

2019

- New Horizons of Transport and Communications, Doboj, 29-30 November
- Annual POLIS Conference, Brussels, 26-27 November
- 8th International Cycling Safety Conference, CARRS-Q, Brisbane, 18-20 November
- Road Safety in Local Communities, Banja Luka, 24-25 October
- 32nd ICTCT Conference, Warsaw, 24-25 October
- 9th ICTR, HITE/HIT, Thessaloniki 24-25 October
- 26th ITS World Congress, Singapore, 21-25 October
- International Conference on Road Safety & Simulation, NADS, Iowa, 14-17 October
- 47th European Transport Conference, Dublin, 09-11 October
- World Road Congress Abu Dhabi, PIARC, 6-10 October
- EU-Safety 2019, EuroSafe, Luxembourg, 3-4 October
- Prevention of Accidents at Work (WOS), Vienna, 23-26 September
- 24th Living and Walking in Cities Conference, Brescia, 12-13 September
- IRCOB Conference 2019, Florence, 11-13 September
- Transportation Systems of the Future - Mobil.TUM, TUM, Munich, 11-12 September
- 8th Symposium - hEART2019, Budapest, 4-6 September
- 22nd International Council on Alcohol, Drugs, Traffic, and the 8th Symposium on Naturalistic Driving Research, Munich, 11-12 September

ETSC





# NRSO Data and Knowledge Systems

## Databases

- **SANTRA** - Greek Road Accident Database with disaggregated data (1985 - 2017, 1,2 million recordings)
- **CARE** - European Road Accident Database with disaggregated data (1991 - 2017, 36 million recordings)
- **IRTAD** - International Road Accident Database with aggregated data
- Databases of **International Organisations** (WHO, IRF, ERF, UITP)
- Databases with **Aggregated Data** (Vehicle fleet, veh-km, driver behavior, etc.)

## Knowledge Systems

- Digital Road Safety **Library** > 5.000 key Road Safety Reports
- International **Bibliography** databases (scopus, science direct)
- Analysis **tools** (traffic, simulation, statistics)





# NRSO Research Infrastructure

- **Driving Simulator** (Foerst 1/4 cab, moving base) for driver behavior experiments
- Unmanned Aerial Vehicles (**Drones**) for traffic monitoring
- Smartphone **Telematics** application (powered by OSeven) for driver behaviour monitoring
- On-Board Diagnostics Devices (**OBD**) for driver behavior monitoring
- **Cameras** and other devices for traffic counts, speed monitoring, position monitoring (GPS)





# Road Safety Research Areas





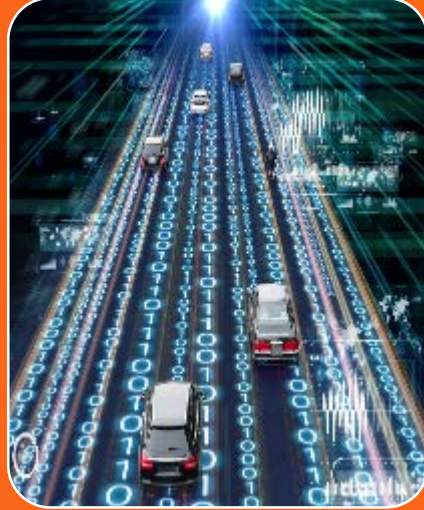
# The Road Safety Research Areas



Road  
Safety Data  
&  
Knowledge  
Systems



Driver  
Safety  
Behaviour



Road  
Infrastructure  
Safety



Driver  
Behaviour  
Telematics



Traffic  
Automation  
and Safety



# Road Safety Systems

- [Nrso - The NTUA Road Safety Observatory](#)
- [Erso+ - The European Road Safety Observatory](#)
- [SaferAfrica - The African Road Safety Observatory](#)
- [SafetyCube - European Road Safety Decision Support System](#)
- [SafeFITS - Global Road Safety Model](#)
- [Pract - The CEDR Road Safety APM and CMF Repository](#)
- [BeOpen - Open science in road safety](#)
- [RscKsa - The road safety data center of Saudi Arabia](#)



# Driver Safety Behaviour

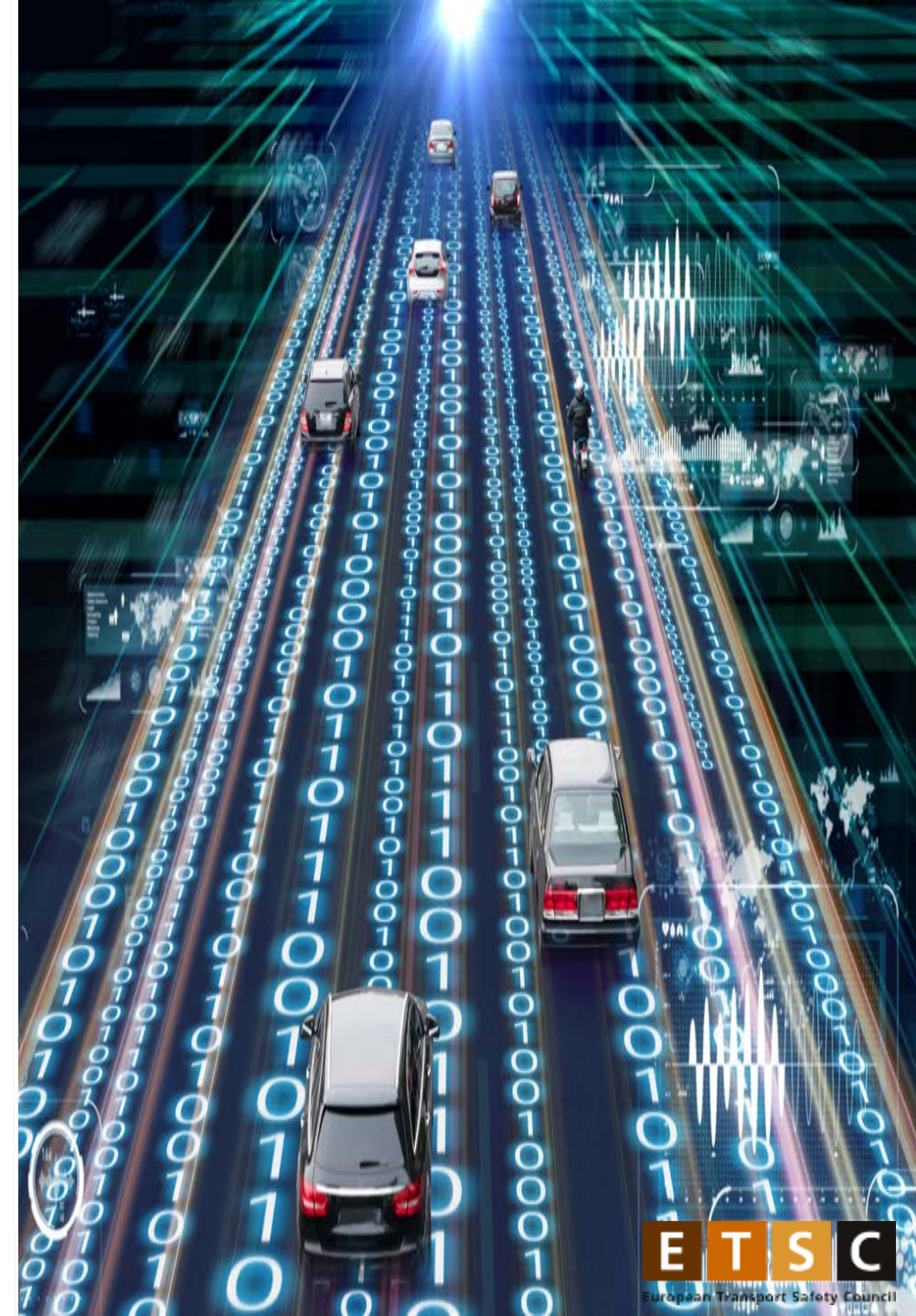
- [Esra](#) - Road safety attitudes in Europe
- [SafeCulture](#) - Road safety culture in Greece and in Norway
- [OSeven](#) - Monitoring driver behaviour through mobile phones
- [Velivr](#) - Cycling under the influence of alcohol and drugs
- [Skillful](#) - Safety skills of future transportation professionals
- [SafeBehave](#) - Actions to improve drivers' safety behavior





# Road Infrastructure Safety

- [i-safemodels](#) - Modelling crash modification factors globally
- [EibCba](#) - Economic analysis of road infrastructure safety projects
- [Pract](#) - The CEDR Road Safety APM and CMF Repository
- [e-mopoli](#) - Safety implications from electromobility
- [CampSump](#) - Mobility and safety in University Campuses
- [WeatherSafe](#) - Predicting road accidents with real time data



# Driver Behaviour Telematics

- i-Dreams - Driver-vehicle-environment interactions and safety tolerance
- BeSmart - Smartphone applications for driver safety behaviour support
- Sesame - Smartphone exploitation for event spatial analysis & mapping
- OSeven - Data science techniques for benchmarking driving efficiency





# Traffic Automation and Safety

- Drive2theFuture - Driver needs and behaviour in automated traffic
- Levitate - Societal impacts of connected and automated vehicles
- Show - Shared Automation Operating Models for Worldwide Adoption
- Hadrian - Holistic Approach for Driver Role Integration and Automation Allocation for European Mobility Needs





# Road Safety Research Perspectives





# Overall Key Road Safety Remarks

- **Speed** is highly misunderstood by all
- **Vulnerable road users** are not accommodated
- We spend too much without effectiveness **monitoring**
- Unrealistic expectations of **technology** (especially of automated vehicles)
- Too much **data**, too little usage
- Need for more road safety **science and budgets**





# Road Safety Policy Perspectives

- Focus on the **key road accident risk factors**:
  - Speed, Speed and Speed
  - Drink and Drive
  - Distracted Driving
  - Not using seat belt and helmet
- Adapt **urban mobility management** to accommodate and balance current and future mobility and safety needs of the vulnerable road users (pedestrians, cyclists, motorcyclists): Reduce Speed everywhere.
- Develop strong **road safety culture** of the Authorities and all Stakeholders (safe system approach) and the whole population.





# Road Safety Technology Perspectives

- **Digitalization** opens great new data possibilities for:
  - road user support and guidance
  - evidence based public and private road safety decision making at all levels
- New great potential for seamless **data driven procedures** from safety problems identification to selection and implementation of optimal solutions
- Exploitation of the high safety potential of **vehicle and traffic automation**, with focused research on the transition phase and the vulnerable road users





# NTUA and ETSC

- A **long standing cooperation** further officialised.
- Support ETSC with **scientific evidence** for:
  - clear problem analyses
  - choosing optimum solutions
- Highlight the great need for:
  - more **data** and knowledge
  - high end analysis of current and future data
  - better exploitation of digital era potential
- Further contribute at the **ETSC Network**
  - close cooperation with all ETSC Members
  - exploit ETSC road safety support in Greece
  - work together for vision zero in Europe and globally







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**George Yannis**

Professor

Brussels, 10 October 2019