The NTUA Road Safety Observatory

George Yannis
Professor
Together with: all the great nrso team
Presentation outline

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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) 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 - 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 - 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 - Research 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 300 presentations in scientific conferences
- more than 200 international and more than 100 national
- after invitation in more than 150 of them

Most of them available on-line at:
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
Cooperations and Partners
Our Cooperations - Greece
Our Cooperations - Europe
Our Cooperations - Worldwide
## Partners - Universities

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<tr>
<th>Loughborough University</th>
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George Yannis, The NTUA Road Safety Observatory - NRSO
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

- 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+)

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The NRSO website (2/2)

A dynamic website with a wealth of information

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
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
- Online Road Safety **Library** > 5.000 key Reports
- International **Bibliography** database (scopus, science direct)
- Analysis **tools** (traffic, simulation, statistics)
NRSO Equipment

- **Driving Simulator** (Foerst ¼ cab, moving base) for driver behavior experiments
- Unmanned Aerial Vehicles (**Drones**) for traffic monitoring
- On-Board Diagnostics Devices (**OBD**) for driver behavior monitoring
- **Cameras** for traffic monitoring
- **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

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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

- **Levitate** - Societal impacts of connected and automated vehicles
- **Drive2theFuture** - Driver needs and behaviour in automated traffic
- **Erso+** - Automated Traffic and Safety Synthesis
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 use of 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

- **Technology** can be the new road safety driver, through:
  - Public private partnerships
  - Clear problem analyses (well defined objectives)
  - Systematic effectiveness monitoring

- **Great need** for:
  - more data and knowledge
  - better exploitation of current and future data
  - broader geographical coverage

- **Data** focus on:
  - more accurate road accident data (LMIC Counties)
  - exposure data and performance indicators
  - measures and policies effectiveness evaluation
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
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