FIFTH UNITED NATIONS GLOBAL ROAD SAFETY WEEK

6-12 May 2019

Save Lives
#SpeakUp

The NTUA Road Safety Observatory

www.nrso.ntua.gr

George Yannis

Professor

Together with:
all the great nrso team

Presentation outline

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4. Road Safety Research Areas (6)
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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

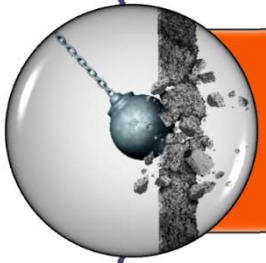
with high level scientific expertise in:

- 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 - The value of the Researcher

The value of the Researcher:

- starts with carrying out excellent research,
- is tested by publishing in high-level peer review journals and
- makes the difference when awarded 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

SafetyCube

SKILLFUL

SAFER AFRICA

levitate

BE OPEN

iDREAMS

DRIVE2 THE FUTURE

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

Available on-line at: 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

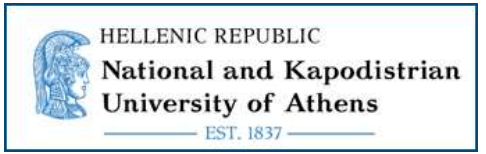
Cooperations and Partners

Our Cooperations - Greece

Our Cooperations - Europe

Our Cooperations - Worldwide

Our Partners - Universities



Our Partners - Research Institutes

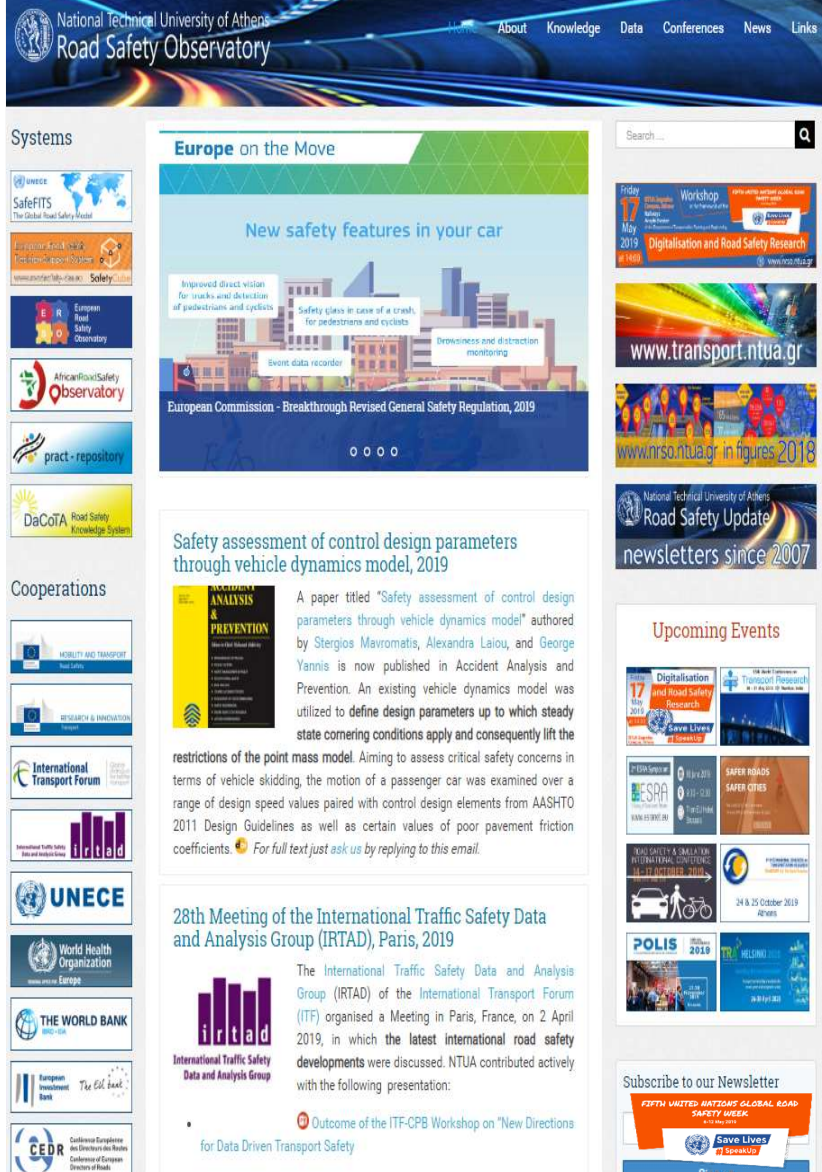
NRSO Website and Systems

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

- 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 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.

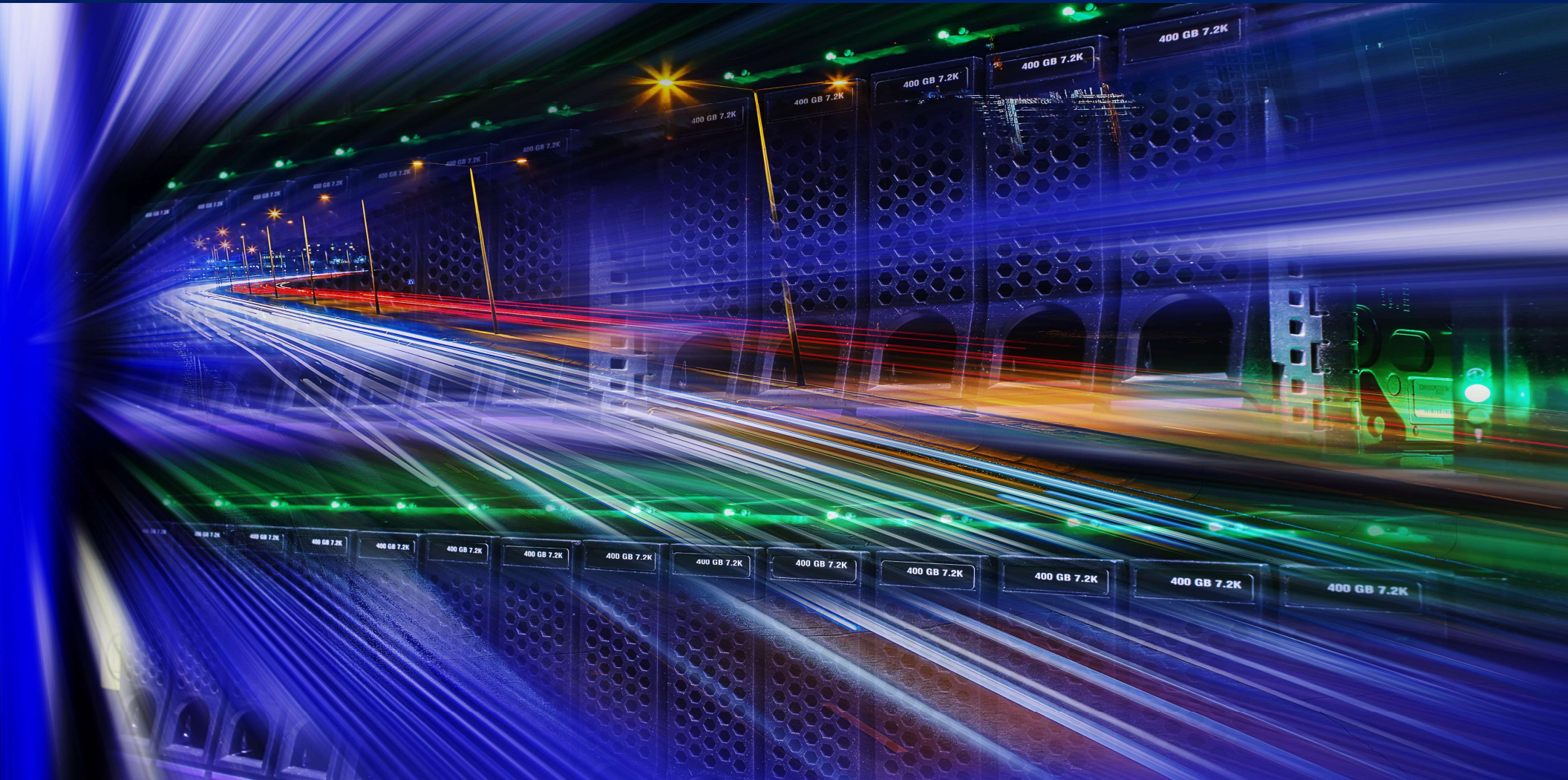
Knowledge Systems

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

NRSO Research Infrastructure

- 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)

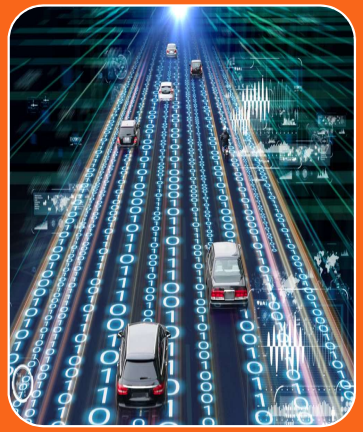
Road Safety Research Areas



The Road Safety Research Areas

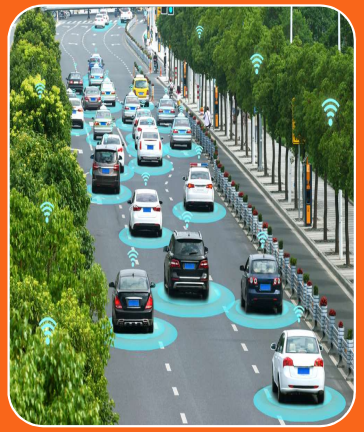
Road Safety Data & Knowledge Systems

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

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

George Yannis, The NTUA Road Safety Observatory - NRSO

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

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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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