



Thematic Group Safety Meeting Madrid, 18 November 2019

The NTUA Road Safety Observatory



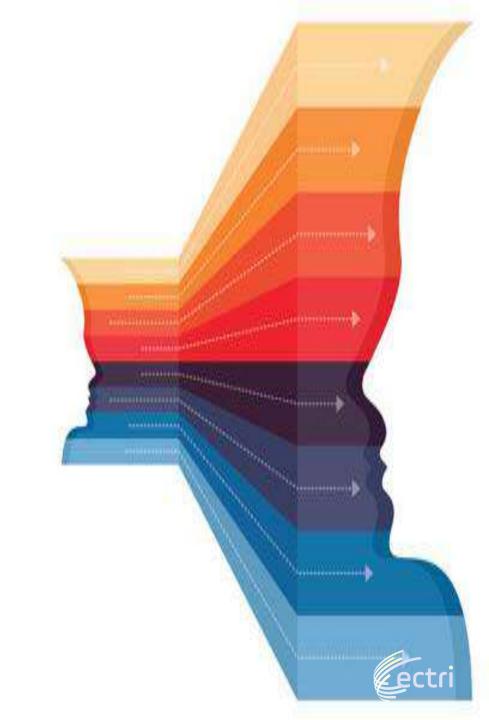
George Yannis

Professor

Together with: all the great nrso team

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) 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

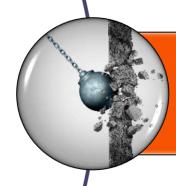


NRSO – Our Fundamental Research Principles



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
- ➤ 75 of these research projects were assigned through highly competitive (national or international) procedures
 - Horizon 2020: 9 projects out of 39 proposals submitted















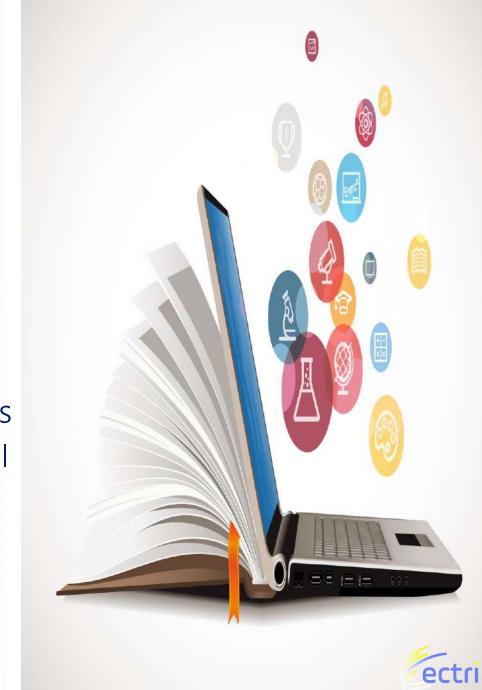
HORIZ N 2020



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





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)







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
- ≥100+ electronic newsletters since 2007
- >tens of tweets and social media posts annually
- ➤ network of more than 3.500+ road safety experts in Greece (800+) and worldwide (2.700+)









A paper titled "Safety assessment of control design parameters through vehicle dynamics model" authored by Stergios Mavromatis, Alexandra Lajou, and George Yannis is now published in Accident Analysis and Prevention. An existing vehicle dynamics model was utilized to define design parameters up to which steady state comering conditions apply and consequently lift the

restrictions of the point mass model. Aiming to assess critical safety concerns in terms of vehicle skidding, the motion of a passenger car was examined over a range of design speed values paired with control design elements from AASHTO 2011 Design Guidelines as well as certain values of poor pavement friction coefficients. For full text just ask us by replying to this email.

28th Meeting of the International Traffic Safety Data and Analysis Group (IRTAD), Paris, 2019



The International Traffic Safety Data and Analysis Group (IRTAD) of the International Transport Forum TTF) organised a Meeting in Paris, France, on 2 April 2019, in which the latest international road safety developments were discussed. NTUA contributed actively with the following presentation:

Outcome of the ITF-CPB Workshop on "New Directions for Data Driven Transport Safety



Road Safety Updat

newsletters since 200

Upcoming Events









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
- reachaustive list of road safety Conferences in Greece and globally
- ➤ links to dozens of road safety Resources globally



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

Cooperations

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DaCoTA Road Safety

Observatory

Systems





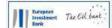












2019

- 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 Luca, 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
- IRCOBI 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 Safety, Edmon. 1. August
 8th Symposium on Naturalistic Driving Research, MUARC, Melbourne, 13-14 August



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.

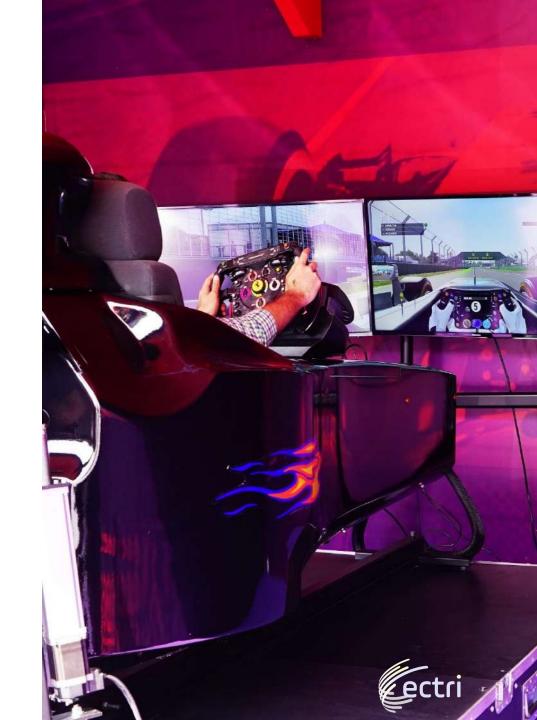
Knowledge Systems

- > 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 ¼ 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

- ► Erso+ The European Road Safety Observatory
- ➤ SaferAfrica The African Road Safety Observatory
- ➤ <u>SafetyCube</u> <u>European Road Safety Decision</u> <u>Support System</u>
- ➤ SafeFITS Global Road Safety Model
- ▶ Pract The CEDR Road Safety APM and CMF Repository
- ➤ BeOpen Open science in road safety
- ► Nrso The NTUA Road Safety Observatory



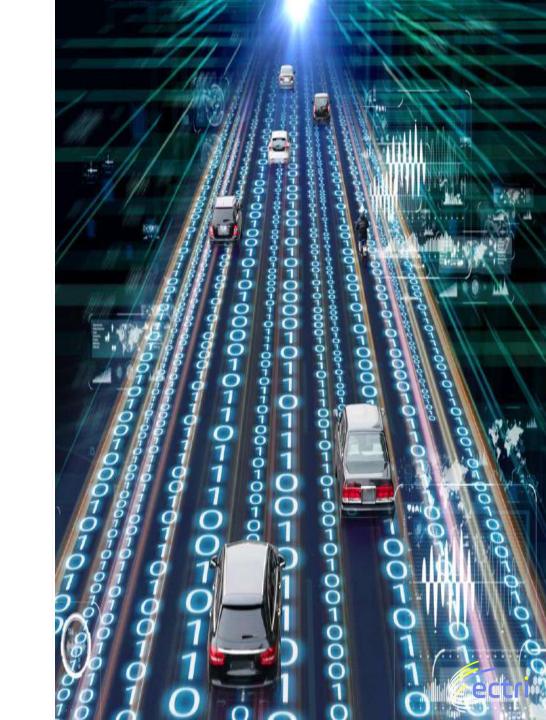
Driver Safety Behaviour

- **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

- ➤ EibCba Economic analysis of road infrastructure safety projects
- ▶ Pract The CEDR Road Safety APM and CMF Repository
- ➤ WeatherSafe Predicting road accidents with real time data



Driver Behaviour Telematics

- ➤ 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
- ➤ <u>Drive2theFuture</u> <u>Driver needs and</u> behaviour in automated traffic



Road Safety Research Perspectives



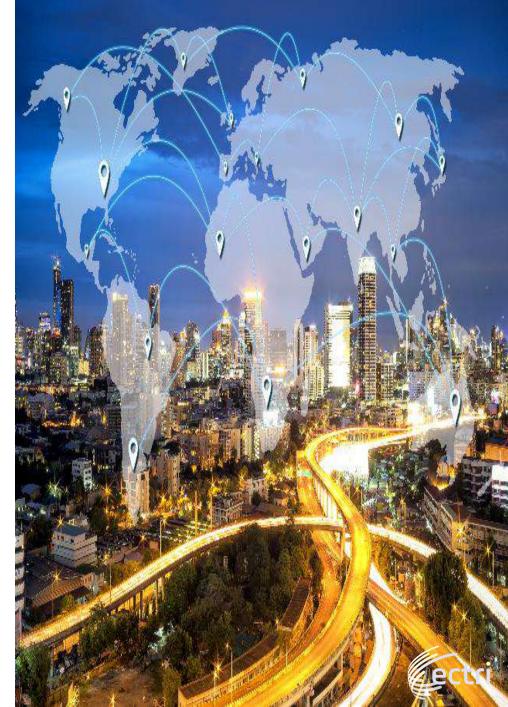
Overall Key Road Safety Remarks

- >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

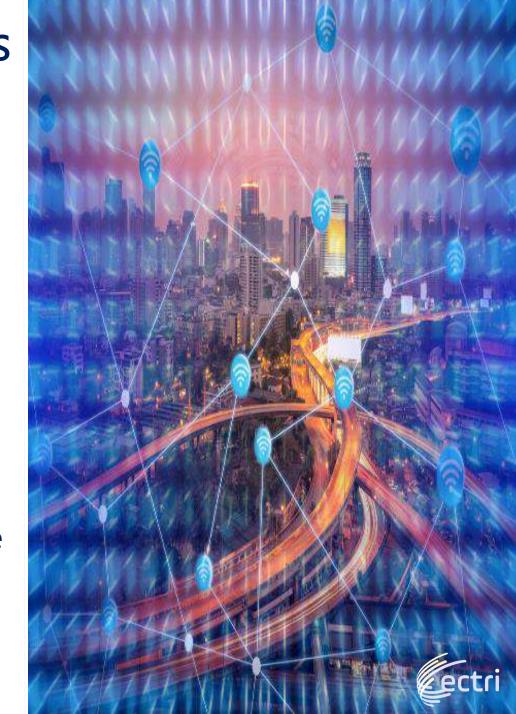
- Technology can be the new road safety driver, through:
 - Public private partnerships
 - Clear problem analyses (well defined objectives)
 - Systematic effectiveness monitoring
- Great need for:
 - more data and knowledge
 - better exploitation of current and future data
 - broader geographical coverage
- 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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