



ECTRI General Assembly Meeting
Athens, 25-26 November 2024

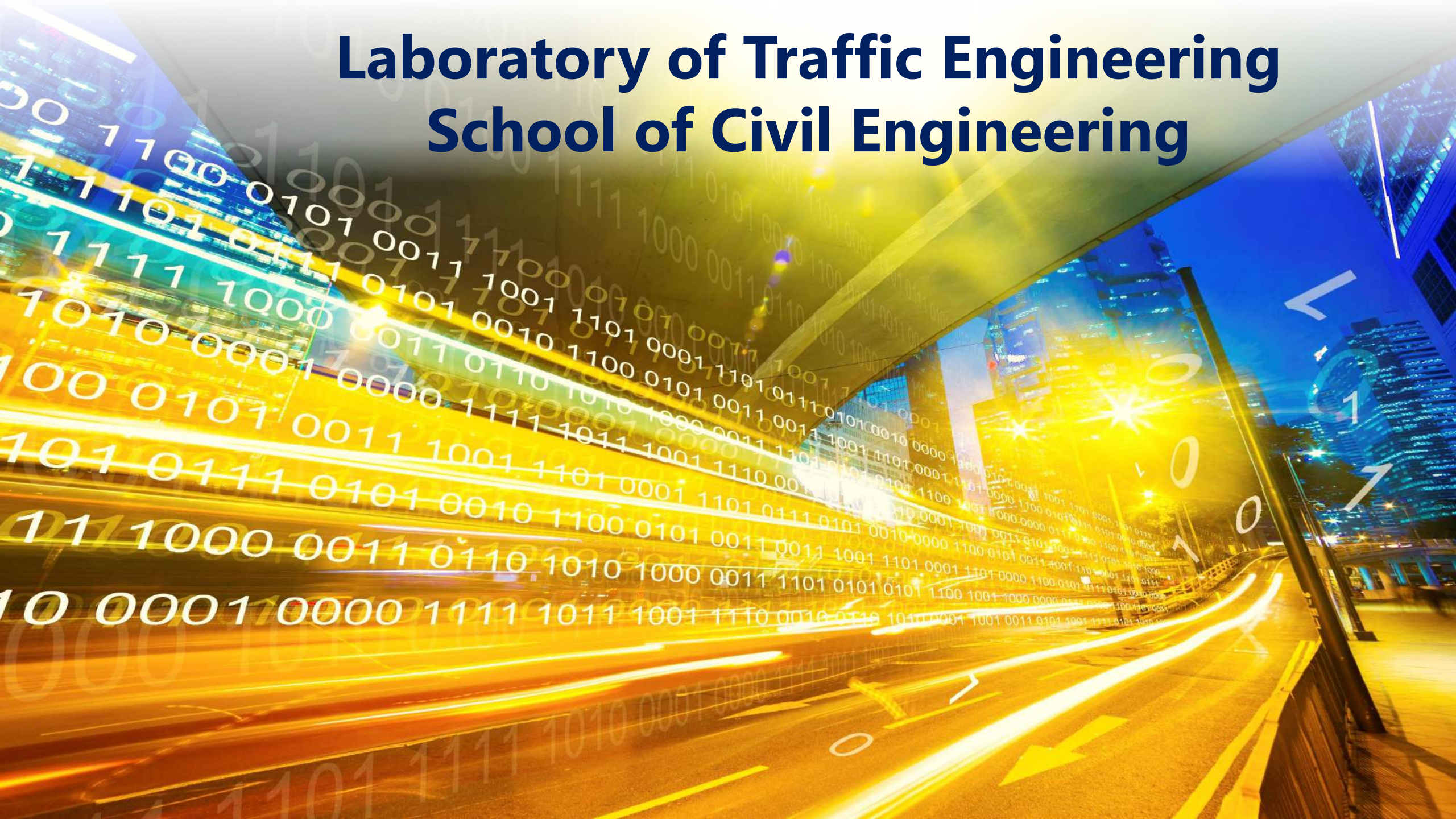
Laboratory of Traffic Engineering

George Yannis
Professor, Director



Department of Transportation Planning and Engineering,
National Technical University of Athens

Laboratory of Traffic Engineering School of Civil Engineering



The NTUA Laboratory of Traffic Engineering

- The Laboratory of Traffic Engineering (LTE), established in 1998, is a **Center of Research and Innovation Excellence** in Traffic Engineering, with global recognition
- It belongs to the **Department of Transportation Planning and Engineering** (www.transport.ntua.gr) of the School of Civil Engineering (www.civil.ntua.gr)
- Since its establishment, the LTE contributes to transportation science through numerous **academic and research activities**



Laboratory People

A dynamic team of more than 40 renowned scientists:

- Faculty 2
- Post Doctoral Researchers 5
- Ph.D. Candidates 22
- Research Assistants 10
- Information Systems Engineers 2
- Administrative assistants 3



George Yannis, Director of Laboratory of Traffic Engineering



Laboratory Faculty



George Yannis
Professor, Department Director



Eleni Vlahogianni
Professor



Courses

1. Traffic Flow theory

7th Semester

2. Urban Road Networks

8th Semester

3. Traffic Management and Road Safety

9th Semester

4. Analysis Methods in Traffic Engineering

9th Semester

5. Quantitative Methods in Transportation

9th Semester

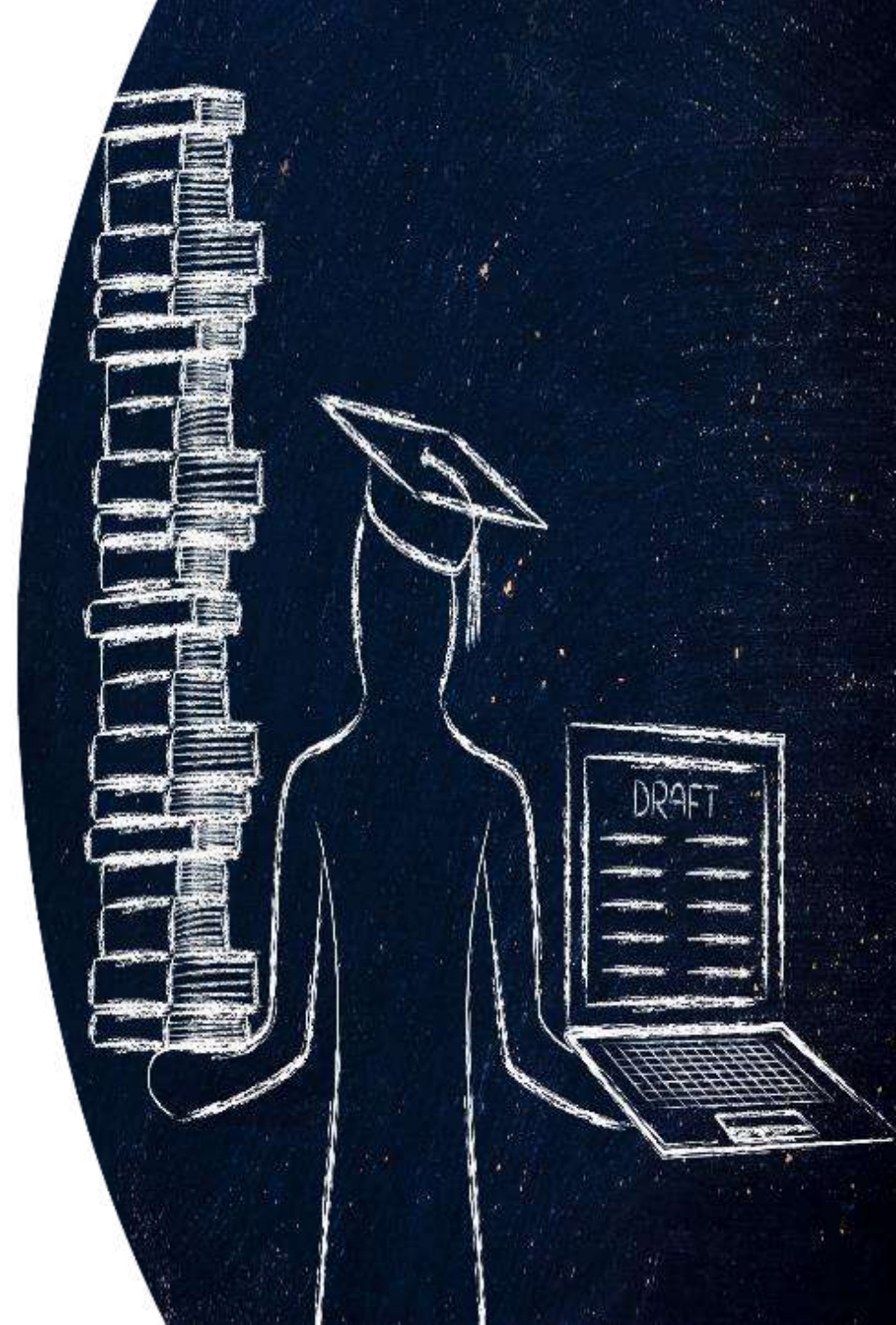
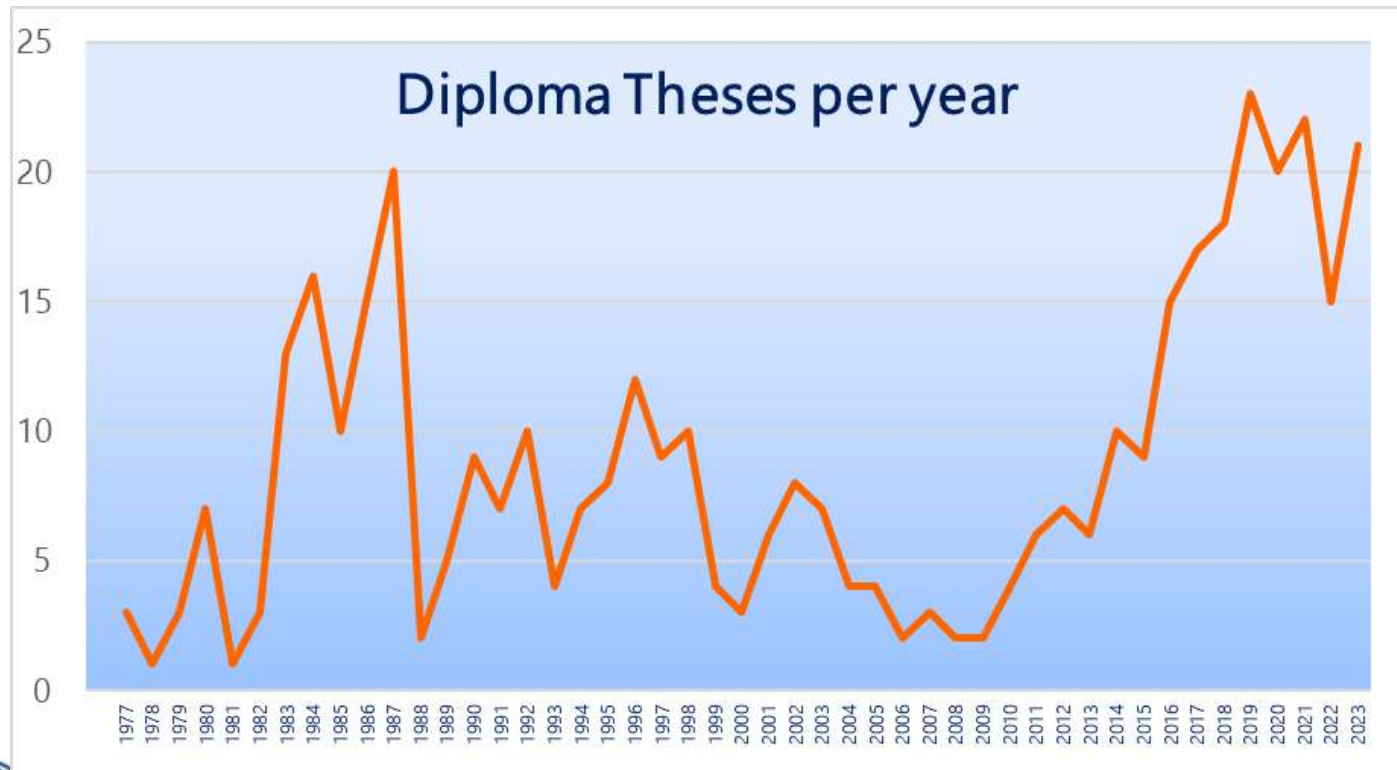
6. Integrated Project in Transportation Engineering

9th Semester



Diploma Theses

- 465 Diploma Theses since 1977
- 170 Diploma Theses since 2014
- 20 Diploma Theses per year (lately)



Research Projects

More than **170 Research Projects**

> **90** International

> **80** Greek

With more than **350** national and international organizations

More than **120** through highly competitive procedures



Scientific Publications

More than **1.100** Scientific Publications

Scientific Journals **>400**

Conference Proceedings **>600**

Conferences Presentations **>700**



Research Infrastructure

1. Driving Simulator
2. Unmanned Aerial Vehicles (UAVs)
3. On-Board Monitoring Devices
4. Traffic Counts Devices
5. Data Bases
6. Data and Knowledge systems
7. NTUA Road Safety Observatory
8. Software



Driving Simulator

Foerst Driving Simulator FPF 1/4 cab

- Motion Base
 - 2 degrees of freedom
- Programming **Software Tool**
 - Programming driving scenarios in different conditions
 - Investigation of driver's behaviour in extreme traffic conditions and conditions of difficult geometry
- Driver **Behaviour Data**
 - Kinematic characteristics
 - Speed, acceleration, headways, time-headways
 - Time To Collision
 - Track of the vehicle
 - Reaction Time



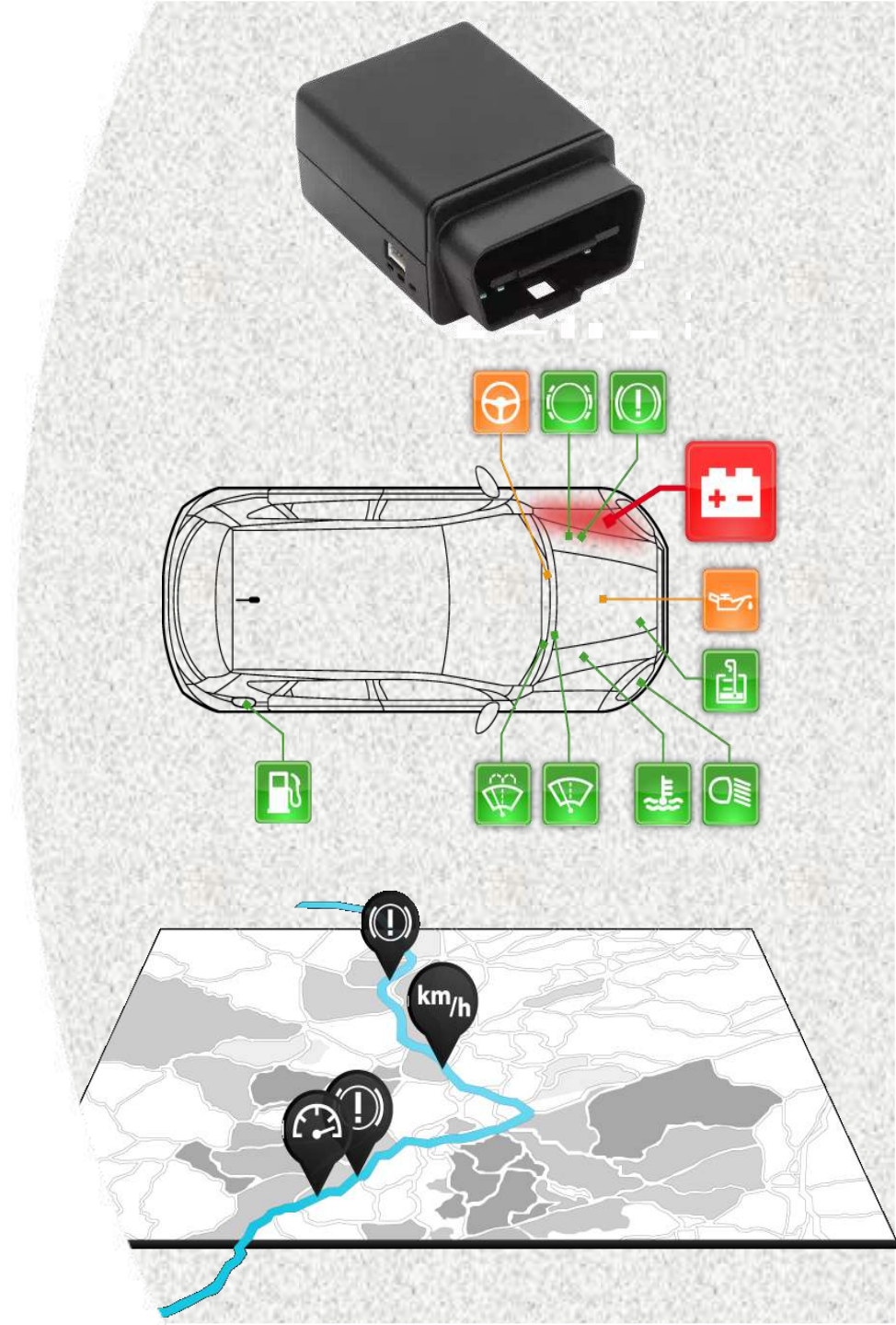
Unmanned Aerial Vehicles (UAVs)

- Traffic **monitoring**
- Trajectory data collection of **vehicles and pedestrians**
- Detection of critical traffic and **roadway conditions**



On-Board Monitoring Devices

- Vehicle **performance** monitoring data collection
- Driving performance **monitoring** and data collection
- Fuel **consumption** data collection



Traffic Counts Devices

- **Manual** traffic counters
- Counters of turning **templates traffic**
- Automatic traffic counters **sectional road** (ADR)
- Radar **speed** detection (Laser)
- Device for measuring and analyzing **traffic to junction**
- System for recording and analyzing **real-time traffic** (Autoscope)
- Device road traffic **noise levels**
- GPS devices log **position information**



Data Bases

- **SANTRA** - Greek Road Accident Database with disaggregated data (1985 - 2019, 1,3 million recordings)
- **CARE** - European Road Accident Database with disaggregated data (1991 - 2020, 40 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.)
- Digital **Road Safety Library** > 6.500 key Reports



Data and Knowledge Systems

- **Erso** - The European Road Safety Observatory
- **SafetyCube** - European Road Safety Decision Support System
- **SafeFITS** - Global Road Safety Model
- **Pract** - The CEDR Road Safety APM and CMF Repository
- **Levitate** – CCAM Policy Support Tool
- **SmartMaps** - Smart Mapping Tool for Safer and Eco Driver Behaviour
- **NRSO** - The NTUA Road Safety Observatory



Software

- Traffic Flow Analysis
 - HCM, Synchro, TSIS
- Macroscopic and Microscopic Traffic Flow Simulation
 - AIMSUN, Saturn, Contram, Simtraffic, Corsim
- Statistical Analysis
 - SPSS, R, MLWIN, MATLAB, LIMDEP, Python
- Traffic Flow Forecast, Traffic Flow distribution network
 - CUBE



Cooperations & Partners



Cooperations - Greece



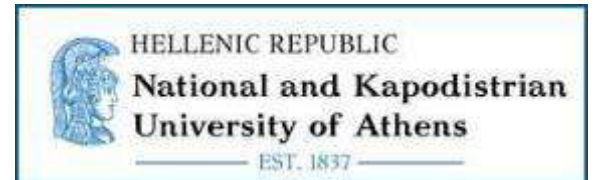
Cooperations - Europe



Cooperations - Worldwide



Partners - Universities



Partners - Research Institutes



Research Areas



Research Areas

Traffic Management

- Data driven traffic flow analysis and forecasting
- Mobility as a service, electromobility, connected/shared mobility
- Network level traffic prediction and management
- Design and operation of traffic management & parking systems

Road Safety

- Driver Safety Behavior & Telematics
- Road Infrastructure Safety
- Road Safety Data, Knowledge & Management Systems

Intelligent Transportation Systems

- Smartphone sensing and analytics, driving telematics & analytics
- Traffic Automation
- Impact assessment of ITS, mobility, environment and safety



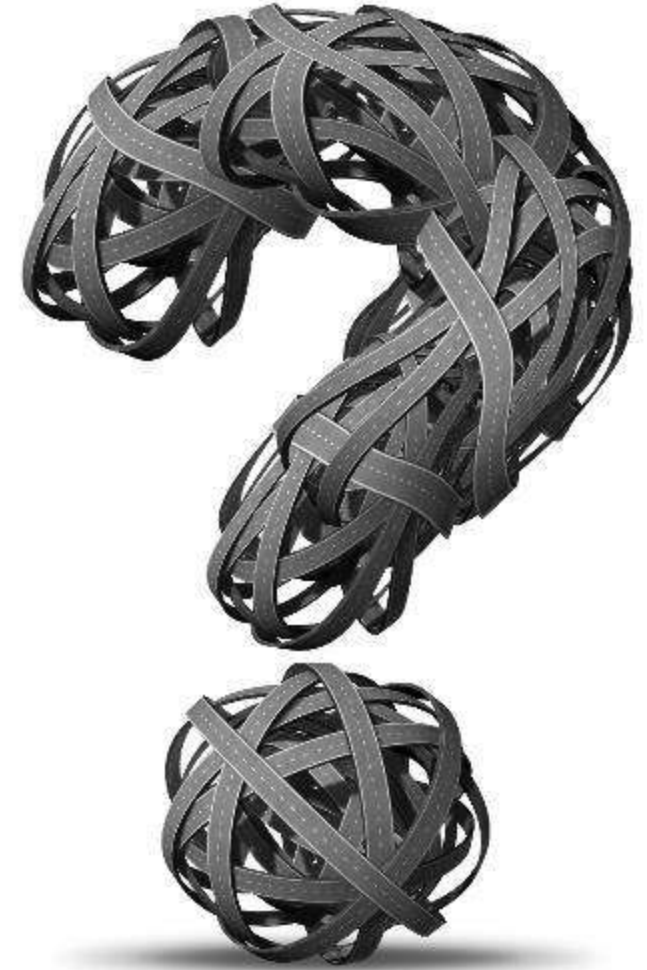
Traffic Management - Topics

- Data driven traffic flow analysis and **forecasting**
- Simulation for **automated traffic**
- Mobility as a service, **electromobility**, connected and shared mobility
- UAV based traffic **monitoring and analysis**
- Traffic and safety of **PTW, cyclist and pedestrians**
- Network level traffic prediction and **management**
- Evidence based mobility optimization and **policy making**
- Design and implementation of traffic **management systems**
- Design and operation of **parking systems**



Traffic Management Research Questions

- How to improve traffic monitoring using **crowdsourcing**?
- How ICT, social networks and **smartphone sensing** can be used for traffic monitoring control and management?
- Can UAVs be used for **monitoring traffic** and identifying congestion in urban areas?
- What is the impact of **smart mobility services** to large scale network traffic?
- How to manage the **cooperative and automated traffic**?
- Can intelligent **parking services** reduce traffic congestion in cities?



Traffic Safety - Topics

- Driver Safety Behaviour & **Telematics**
- Road **Infrastructure** Safety
- Traffic **Safety Analysis**
- Road Safety Data & **Knowledge Systems**
- Road Safety **Management**



**SAFETY
FIRST**



Traffic Safety Research Questions

- How to improve driver safety **behaviour** with focus on speeding, drink-and-drive and distraction?
- Which are the best solutions for safe traffic of **Vulnerable Road Users**?
- How to integrate safety into urban mobility **planning and operation**?
- How to identify and assess the most appropriate **road safety measures**?
- How to exploit **big data** to support better traffic safety decision making but also driver behavior?
- How are **automation and connectivity** going to improve traffic safety?



ITS and Automation - Topics

- Smartphone sensing and analytics, **insurance telematics**, driving analytics
- C-ITS **applications**
- Traffic **Automation**
- Impact assessment of ITS, c-ITS and CAV on mobility, **environment and safety**



ITS and Automation Research Questions

- Can we accurately predict demand in future cooperative and **connected smart city context**?
- What will be the impact of **automation** in future road networks?
- How to develop efficient **individualized systems** for managing personal mobility?
- How to accurately **forecast traffic evolution** in the era of autonomous, connected and shared mobility?



NTUA Road Safety Observatory

A Center of Research and Innovation Excellence



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 35+ 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 400.000 visits per month,
 - 146 electronic newsletters since 2007,
 - tens of tweets and social media posts annually,
 - network of more than 6.500+ road safety experts in Greece (1.500+) and worldwide (5.000+).
- An excellent **research activity**:
 - More than 500 Diploma Theses & 20 PhD Theses,
 - More than 170 road safety research projects, mostly highly competitive,
 - More than 885 road safety publications (> 258 in scientific journals),
 - More than 160 scientific committees,
 - International Cooperations: European Commission, UN/ECE, OECD/ITF, WHO, World Bank, EIB, ECTRI, CEDR, FEHRL, ERF, IRF, UITP, ETSC, WCTR, TRB, tens of Universities and Research Centers.

George Yannis, Director of Laboratory of Traffic Engineering



The Road Safety Research Areas



Traffic
Automation
and
Safety



Driver
Behaviour
Telematics



Driver
Safety
Behaviour



Road
Safety
Data
Systems



Road
Infrastructure
Safety



Mobility
and
Safety



The NRSO website

A dynamic website with a wealth of information:

www.nrsso.ntua.gr

- since 2004 with more than **2.500 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, the EU and the world
- exhaustive list of road safety **Conferences** in Greece and globally
- links to dozens road safety **Resources** globally



George Yannis, Director of Laboratory of Traffic Engineering

National Technical University of Athens
Road Safety Observatory

Home About Knowledge Data Conferences News Links

Search

Systems

- ERGO European Road Safety Observatory
- SafeFITS The Global Road Safety Model
- pract-repository
- levitate EU FP7 Policy Support Tool
- smartmages SMART MAPPING TOOL

Cooperations

Europe

- MOBILITY AND TRANSPORT
- RESEARCH & INNOVATION
- European Investment Bank The EIB Bank
- European Road Safety Observatory
- UNECE
- ETSC European Transport Safety Council
- CEDR Central European Directorate for the Safety of Transport
- FEHRL
- ectri
- ERF

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 cooperation.

2026

- 26th International Symposium on Transportation and Traffic Theory, Technical University of Munich, Germany, 20-24 July

2025

- ICTR2025, HITE/CERTH, Thessaloniki, 16-18 October
- LWC International Conference, University of Brescia/CeSCAM, Brescia, 11-12 September
- RSSC, VTI, Leeds, 3-5 September
- 31th ITS World Congress, ITS America, Atlanta, 24-28 August
- HEART 2025, Technical University of Munich, Munich, 10-12 June
- 52th ASECAP Study & Information days conference, ASECAP/, 26-28 May
- Transportation Research Symposium, Elsevier, Rotterdam, 25-28 May
- 16th ITS European Congress, ERTICO, Seville, 19-21 May
- 20th International Conference RSLC, RTSA, Vrnjačka Banja, 23-26 April
- 11th International Conference VEHITS, Porto, 2-4 April
- 4th Global Ministerial Conference on Road Safety, Marrakech, 18-20 February
- Road Transport Research Results Conference, European Commission, Brussels, 11-13 February
- Transportation Research Board, TRB, Washington, 5-9 January

2024

- Annual Polis Conference, POLIS, Karlsruhe, 27-28 November
- 24th Road Safety Hackathon, CSDD, Online, 15-17 November
- PIN Talk, ETSC, Rome, 15 November
- ICSC2024, IATSS, Imabari, 5-7 November
- Cycling, Micromobility and Road Safety Seminar, Enschede, 1 November
- POLIS Safety and Security Working Group Meeting, Polis, Online, 30 October
- 9th Road Safety and Simulation Conference, Kentucky, 28-31 October
- DD2024, SAFER/UMTRI, Michigan, 22-24 October
- 36th ICTCT Conference, The Hague, 17-18 October
- IRF2024, Turkish Road Association, Istanbul, 15-18 October
- 24th International Walk21 Conference, Lisbon, 14-18 October

Upcoming Events

- MOLIS 2024
- GLOBAL MINISTERIAL CONFERENCE ON ROAD SAFETY
- INTERNATIONAL SYMPOSIUM ON TRANSPORTATION AND TRAFFIC THEORY
- ICTR 2025

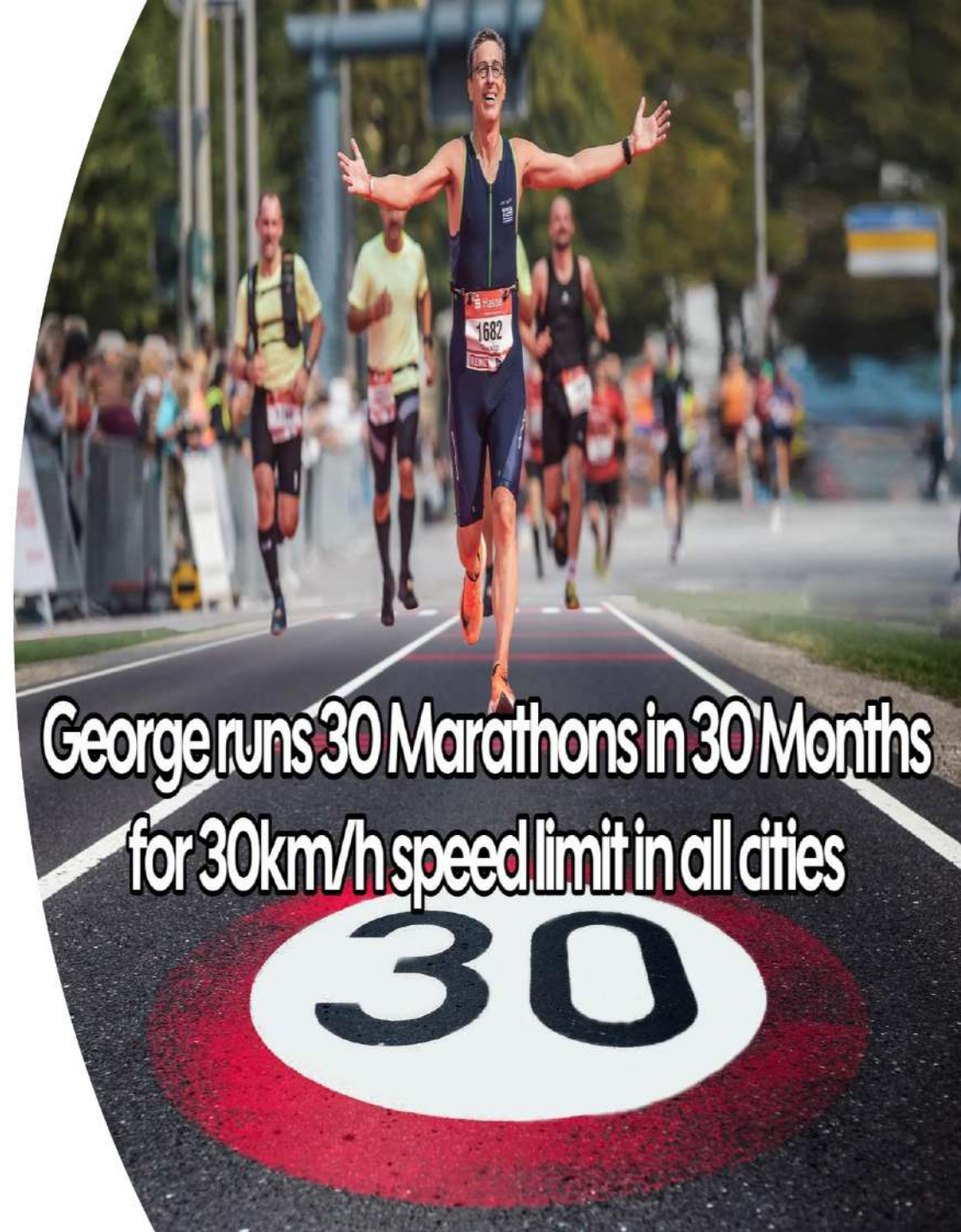
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30 Marathons Campaign

- The discussion and introduction of city-wide 30 km/h speed limit faces strong reactions and rigid inertia, whereas supporters' voices are often **weak and inefficient** resulting in hesitant politicians and Authorities
- After more than 30 years of dedication to road safety science and several Marathon races, Prof. George Yannis decided to step beyond the traditional scientific pleas and combine both passions for a cause: to run **30 Marathons in 30 months** to actively promote the adoption of city-wide 30km/h speed limit in as many cities as possible worldwide



**George runs 30 Marathons in 30 Months
for 30km/h speed limit in all cities**





Zagori - Jul 2022

Helsinki - Aug 2022

Antwerp - Sep 2022

London - Oct 2022

Athens - Nov 2022

Valencia - Dec 2022



Malta - Feb 2023

Rome - Mar 2023

Paris - Apr 2023

Belgrade - Apr 2023

Copenhagen - May 2023

Stockholm - Jun 2023

George - 30 Marathons - 30 Months



Apeldoorn - Jul 2023

Tallinn - Sep 2023

Brussels - Oct 2023

Lyon - Oct 2023

Athens - Nov 2023

Florence - Nov 2023



Nicosia - Dec 2023

Dubai - Jan 2024

Sevilla - Feb 2024

Barcelona - Mar 2024

Paris - Apr 2024

Zurich - Apr 2024



Utrecht - May 2024

Torhout - Jun 2024

Paris - Aug 2024

Warsaw - Sep 2024

Munich - Oct 2024

Athens - Nov 2024



30

Campaign Social Impact

*An Integrated Communication Policy
with Strong Global Impact*

- **26 cities** with Marathon finish
- **3 papers** in scientific journals
- **20 presentations** in conferences/webinars
- **16 interviews** in the electronic media
- **10 newspaper/magazine** articles
- **40 social media** posts
- **48 republished posts** from scientific organisations and institutions (with 80.000+ post impressions)
- **400.000+ pageviews** per year
- **100.000+ global audience** at social media
- **10 International Organisations** Allied



George

runs 30 Marathons in 30 Months
for 30km/h speed limit in all cities

30

geogeruns 30x30.com

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