Mobility and Safety Research
Challenges in Public Transport

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Presentation Outline

1. Department of Transportation Planning and Engineering & NTUA Road Safety Observatory
2. Public Transport and Mobility Activities
3. Public Transport and Road Safety
4. Key Challenges
The mission of the NTUA DTPE (www.transport.ntua.gr) is to **educate scientists engineers and promote science** in the field of transportation planning and engineering.

The NTUA DTPE is a **Center of Research and Innovation Excellence** with global recognition [Ranked 9th in Europe, 39th worldwide (Shanghai Ranking’s 2017), Scientific citations: 3rd in Europe, 19th worldwide (Pulse 2017), Road Safety: 2nd in Europe, 6th worldwide (AAP, 2018)].

A **Team of 60+ Scientists**: 7 Internationally recognized Professors, 15 Senior Transportation Engineers and PostDoc, 30 PhD Candidates, 15 Transportation Engineers and other scientists.

**NTUA DTPE Activities in figures** (since mid 80s):

- More than 1,100 Diploma and 30 PhD Theses,
- More than 330 research **projects**, mostly through highly competitive procedures,
- More than 1,100 scientific **publications** (> 400 in Journals), widely cited worldwide,
- More than 150 scientific **committees**,
- International **collaborations**: EC, UN/ECE, OECD/ITF, WHO, World Bank, EIB, CEDR, FEHRL, ERF, IRF, UITP, ETSC, WCTR, TRB, Universities and Research Centers.
The NTUA Road Safety Observatory (www.nrso.ntua.gr) is a Center of Research and Innovation Excellence on Road Safety, with global recognition [ranked: 2nd in Europe and 6th worldwide (AAP 2018)]

A Team of 25+ 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 3.000 visits per month
- 110+ electronic newsletters since 2007
- tens of tweets and social media posts annually
- network of more than 4.000+ road safety experts in Greece (1000+) and worldwide (3.000+)

An excellent research activity:
- More than 100 Diploma Theses & 6 PhD Theses,
- More than 100 road safety research projects, mostly highly competitive,
- More than 500 road safety publications (> 200 in scientific Journals),
- More than 100 scientific committees,

George Yannis, UITP Research in Mobility Committee – April 2021
Public Transport and Mobility Activities
Public Transport and Mobility activities

NRSO is **actively engaging** in several PT and mobility related activities:

- **Traffic management schemes** for the promotion of Public Transport & Sustainable Mobility
- **Traffic simulation** of urban road networks, including public transport modes
- **Mobility characteristics** of Traffic Safety with emphasis on vulnerable road users
- **Impact Analyses** of electromobility, connected and shared mobility
- **Impact of Traffic Automation** on public transport operations
Athens Great Walk
Reforming public space for the promotion of **public transport** and **active travel modes**

- **Objective:** safe green and efficient transport for all
- Harmonized with the **Sustainable Urban Mobility Plan** of Athens and the related trends in European cities
- **Promoting public transport, walking and cycling** through new bus, pedestrian and cycle lanes as well as mixed traffic with low speeds
- **Wider and safer sidewalks** in central axes to increase accessibility
- **Streets / areas free of private vehicles**
Public Transport fatalities in the EU

- In 2019, **484 fatalities** in accidents involving bus or coach were recorded in the EU.

- Most fatalities in accidents involving a bus/coach occur **inside urban areas** (54%).

- Road fatalities involving buses represent only a **3%** of total urban road fatalities, being by far the safest road transport mode (active and passive safety).

Source: EU CARE Database

Data Processing: NTUA
Transport modes involved in Public Transport accidents

- In bus or coach accidents, **14%** of fatalities are the *occupants of the bus or coach*.

- A *high proportion of vulnerable road users* (pedestrians, cycles, PTWs) is recorded among the fatalities in accidents involving a bus or coach.

- In 2019, *pedestrians accounted for 45%* of fatalities in bus or coach accidents in urban areas.

*Fatalities in accidents involving a bus/coach per transport mode in urban areas, EU, 2019*

Source: EU CARE Database
Data Processing: NTUA
Cross-city analysis in Europe

- A cross-city analysis was performed to estimate the relationship between the mobility characteristics and the number of road fatalities in Europe.

- Various mobility indicators related to modal split, distribution of vehicle fleet by type of vehicle and road network characteristics were examined.

- Mobility data for 25 European cities were collected from the UITP Mobility in Cities Database and accident data from the EU CARE database.

- Generalized Linear Models were developed for all road accident fatalities and for fatalities in different types of accidents.
## Modelling all fatalities

### Variables examined

- Gross Domestic Product (GDP) per inhabitant (euro)
- Urban population density (persons/ha)
- Length of roads per urban hectare (meters/hectare)
- Motorcycles per population (motorcycles/thousand inhabitants)
- **Public Transport Capacity offered** (place*kilometres/inhabitant)
- Percentage of daily trips by bicycle

### Table of Indicators

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Estimate</th>
<th>Wald Chi-square</th>
<th>Sig.</th>
<th>e_i</th>
<th>e_i*</th>
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<tr>
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<td>Road Network Density</td>
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<td>Motorcycles/pop.</td>
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<td>3,872</td>
<td>0,049</td>
<td>-0,085</td>
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<tr>
<td>(Scale)a</td>
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### Omnibus Test

- Likelihood Ratio Chi-square: 23,913, p = 0.01
- Degrees of freedom: 6

### Goodness of Fit

- Log Likelihood: -16,161

Dependent Variable: LN(F/P)
Public Transport effects

- Increase in the **offered public transport capacity** leads to decrease in road fatalities per population.

- **Car occupant fatalities** and fatalities in **darkness** present higher rates of decrease compared to the total number of fatalities.
Key Conclusions

- Buses or coaches are by far the **safest modes of road transport inside urban areas**, recording significantly fewer fatal accidents.

- The **offered public transport capacity** plays a significant role in the improvement of road safety of a city.

- Increase in the offered public transport capacity by a city leads to **greater use of public transport** and therefore, to a lower likelihood of being involved in a road accident.

- Thus, in order to improve city safety, there is a need not only to create a safer road environment, but also to provide incentives to the citizens for the **use of alternative means of transport**.
Key Challenges
Key Challenges

- Imbalance between urban mobility and safety policies
- Speed being a conflicting choice between mobility and safety
- It is impossible to be fast and safe, unless we use efficient Public Transport
- Mobility and safety policies can both benefit greatly from the promotion of public transport and active travelling
- Public transport being up to ten times safer than passenger car traffic
- Broader alliances are required, UITP being a frontrunner
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