Interreg Med project "REMEDIO"
International Conference
"Horizontal condominium as a living lab for Urban Renewals"

Sustainable Urban Mobility and Safety

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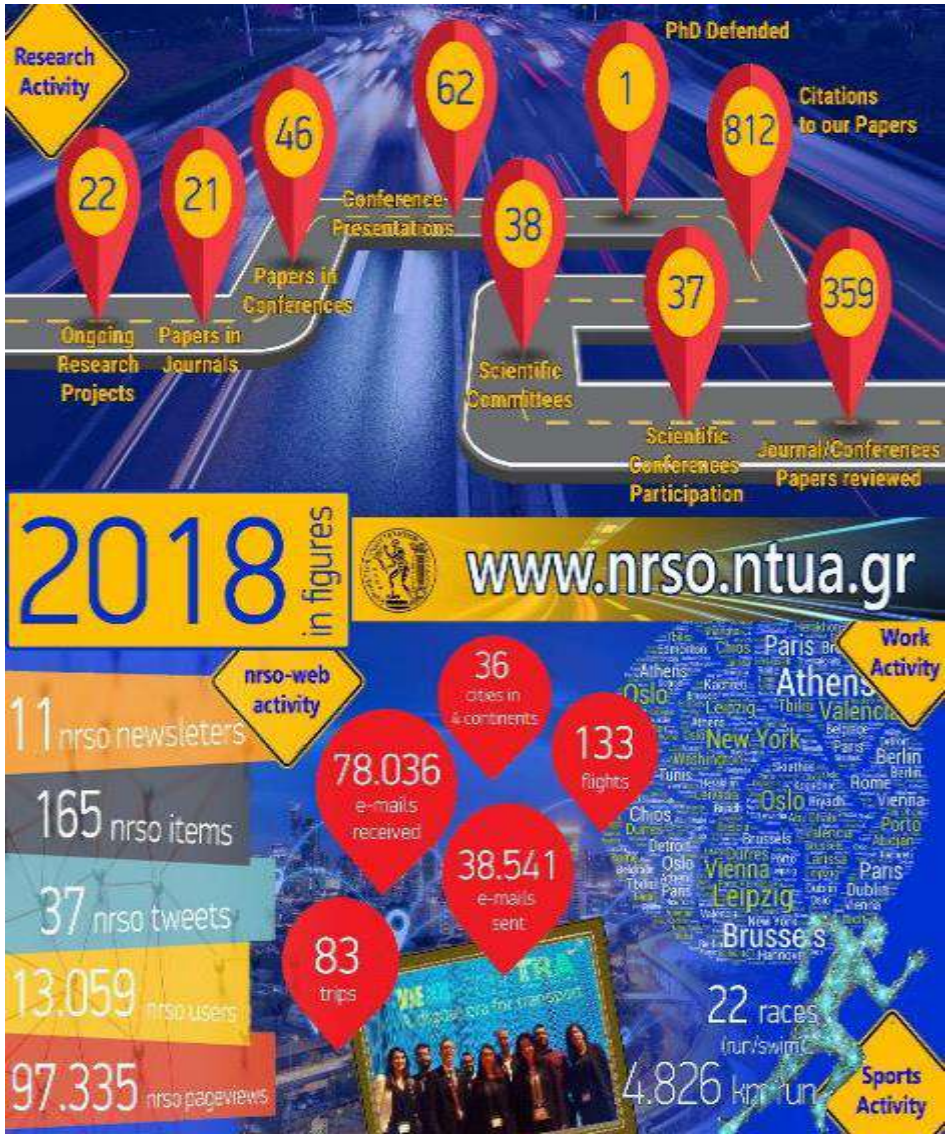
Department of Transportation Planning and Engineering

- The mission of the NTUA DTPE is to **educate scientists engineers and promote science** in the field of transportation planning and engineering.
- The NTUA DTPE is a **Research and Innovation Center of 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, 25 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 road safety 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**: European Commission, UN/ECE, OECD/ITF, WHO, World Bank, EIB, CEDR, FEHRL, ERF, IRF, UITP, ETSC, WCTR, TRB, decades of Universities and Research Centers.

NTUA Road Safety Observatory

- An international reference **road safety information system** since 2004, with the most updated data and knowledge, with:
  - more than 3.000 visits per month,
  - tens of items and social media posts/tweets annually



Urban road safety - Open questions

- Which are the current and **future urban road safety problems**?
- Are they the same across **Europe**?

- How critical are **data** and **evidence based decision making**?
- How much **transferable** are successful urban road safety solutions?

- How to integrate **road safety** into urban mobility plans?
- Can road safety compete **environmental**, **energy** and **mobility** concerns?

- Are **Citizens** and **Authorities** ready for the necessary choices?
- Which are the **future challenges** of urban road safety?

Objectives and Structure

Objective

To provide a comprehensive picture on urban road safety today and of the future challenges, with focus on urban safety and mobility, specially of the vulnerable road users

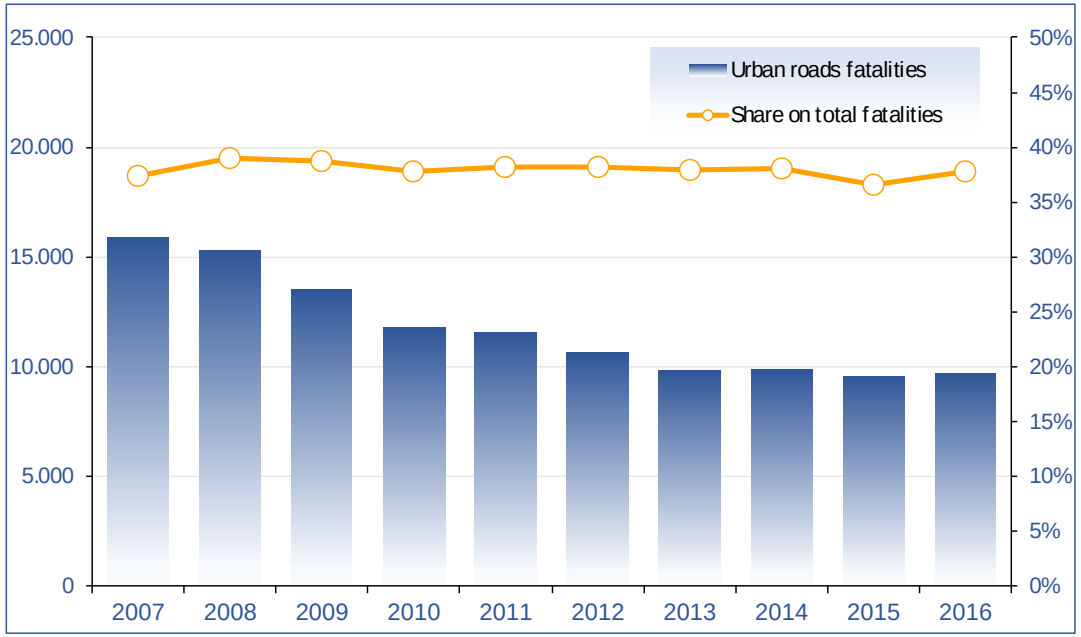
Structure

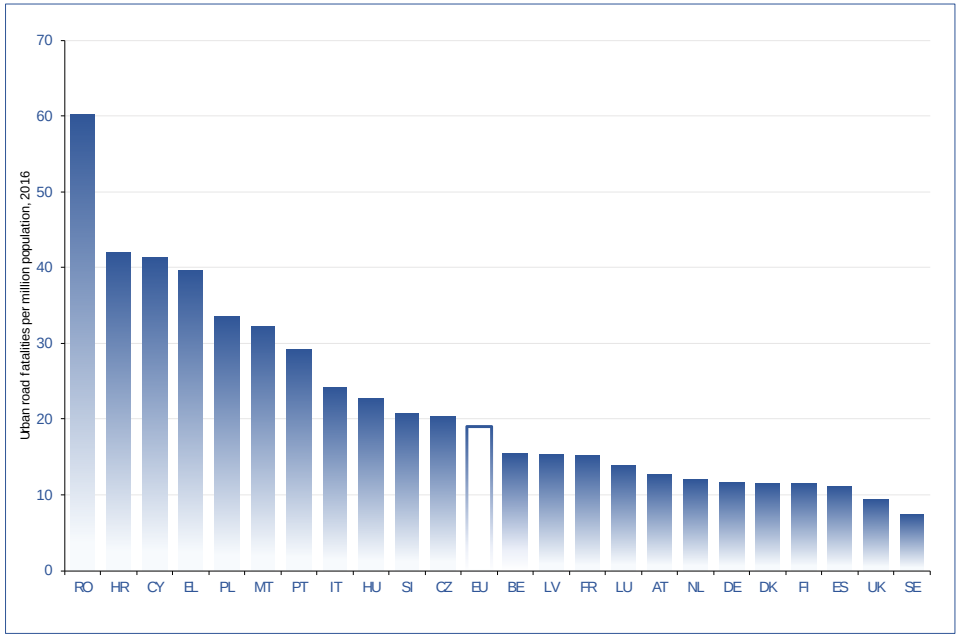
1. Basic facts on urban road safety
2. The need for road safety knowledge
3. Urban road safety priorities
4. Fundamental urban road safety choices

Different urban road safety progress in different countries (1/2)

Road Fatalities change 2008-2017 (source: CARE)

	Urban Areas	
	Inside	Outside
North-Western Countries	-28,8%	-28,1%
Southern Countries	-31,5%	-39,0%
Eastern Countries	-48,7%	-43,6%





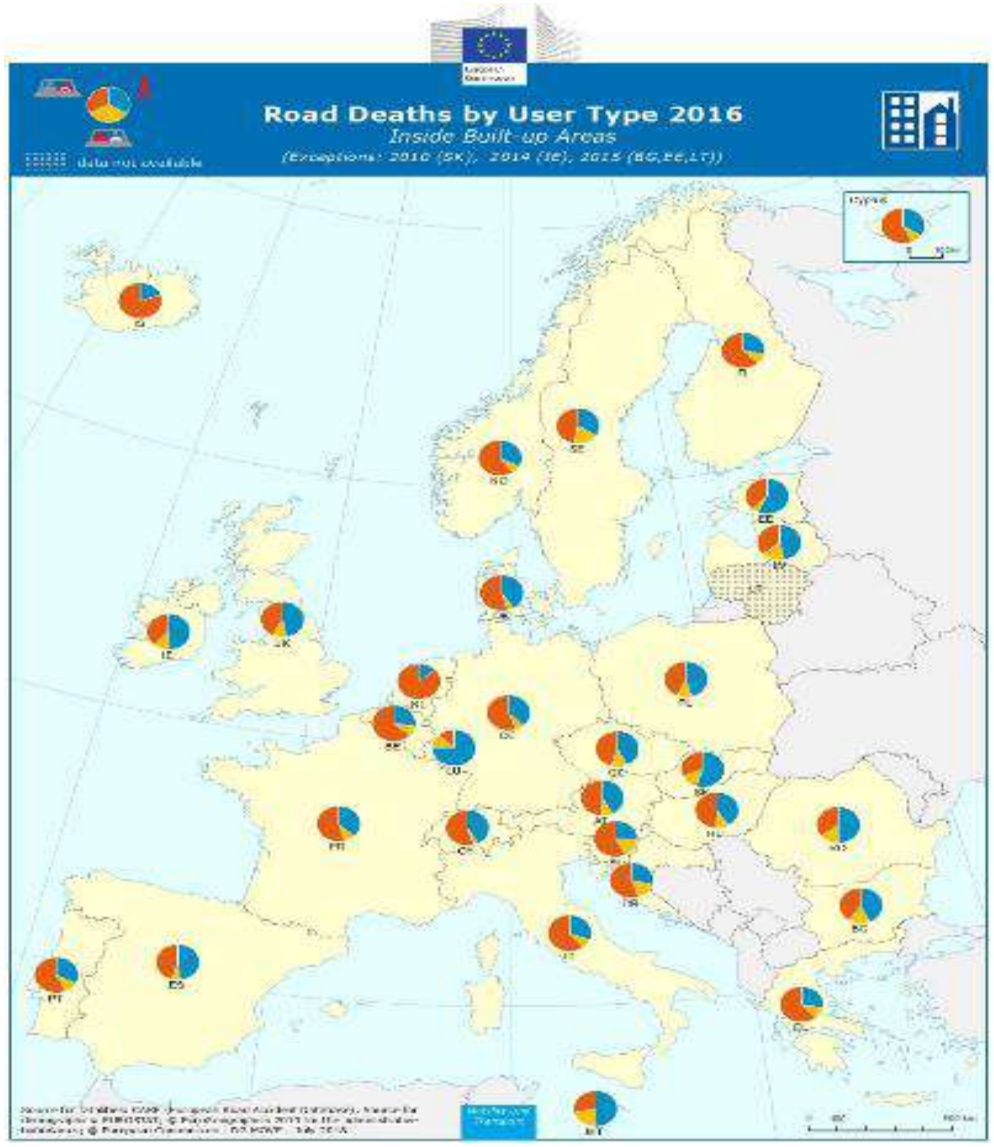
Different urban road safety patterns in different countries (2/2)

Road Fatalities 2016 (source: CARE)

Power Two Wheelers	Urban	Total	%
North-Western Countries	667	3.344	20%
Southern Countries	822	2.693	31%
Eastern Countries	274	3.404	8%

Cyclists	Urban	Total	%
North-Western Countries	531	3.344	16%
Southern Countries	196	2.693	7%
Eastern Countries	388	3.404	11%

Pedestrians	Urban	Total	%
North-Western Countries	1.182	3.344	35%
Southern Countries	920	2.693	34%
Eastern Countries	1.561	3.404	46%



Current Urban Road Safety Problems

- More road fatalities outside urban areas, more **injuries inside** urban areas.

- More **PTWs** in the North-Western EU countries and more **cyclists** in the Southern EU countries result in:
  - Power-two wheelers' safety problems migrating at North and West
  - Cyclists' safety problems of the North migrating at the South

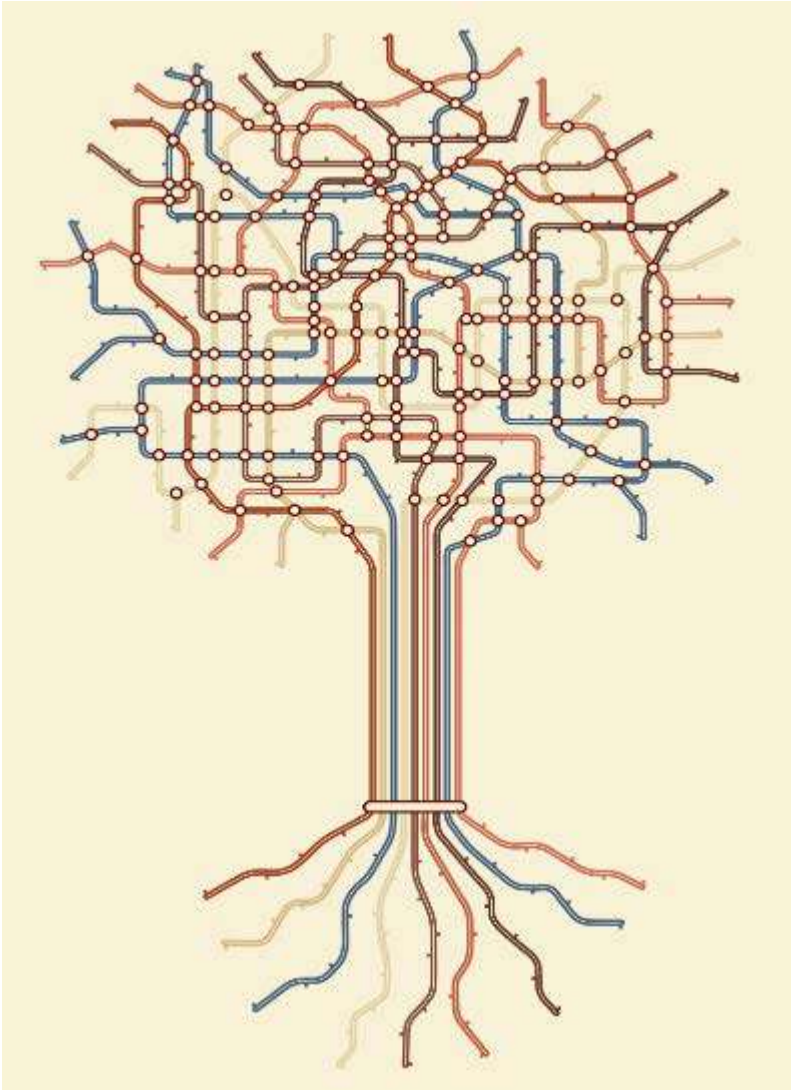
- **Recession** has a direct impact to road fatalities decrease, but lately slow progress is observed.

From Problems to Measures

- The identification of the suitable **measures for specific urban road safety problems** is a key challenge, possible only through the application of scientific and impartial methodologies.

- The **social and economic benefits** from a rigorous application of measures efficiency assessment can be very high.

- Road safety research and international cooperation are the keys to **support evidence based decision making**.



The need for evidence based decision making

- **Positive and negative aspects of each solution** in the short and long term should be demonstrated allowing all urban road safety actors (society, decision makers) to realize the positive and negative consequences of their choices.

- On that purpose there is a clear **need for publicly available high quality and impartial data** and knowledge, with focus on the effectiveness assessment of road safety alternative solutions.

- Good practices manuals are useful but each measure should be tailored to the **particular needs of each urban environment** and the overall network design and traffic operation.

Urban road safety priorities

- Road **user behaviour**
- **Infrastructure**
- **Vehicle** technology
- **Road safety** management

Road user behaviour

Vulnerable road users

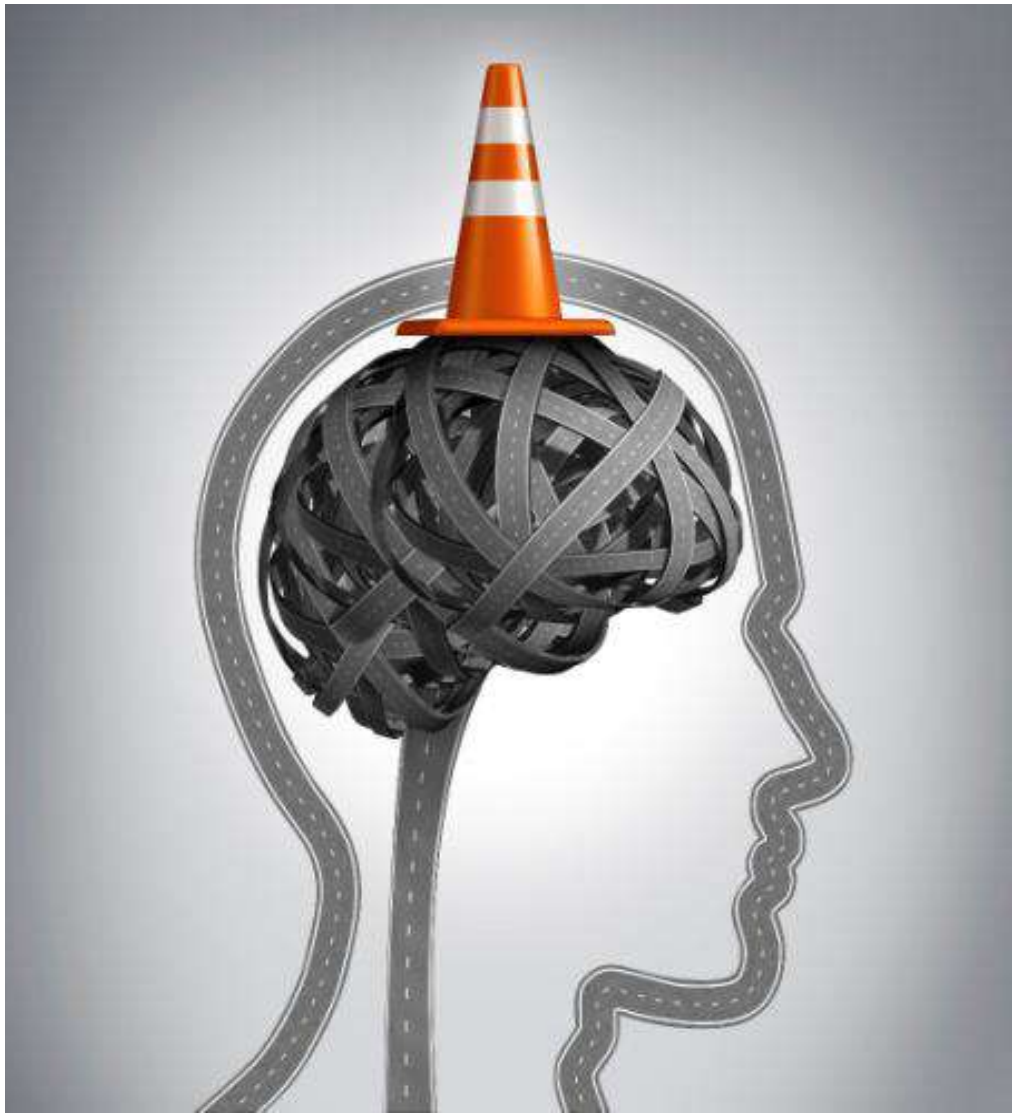
Young: still at highest risk
Elderly: ageing population
Pedestrians: still often overlooked
Cyclists: still often overlooked
PTWs: an emerging problem in several countries

Fit to drive

Driving under the influence of substances
Driver distraction
Driver fatigue
Definitions, measurement, causes and effects

Changing road user behaviour

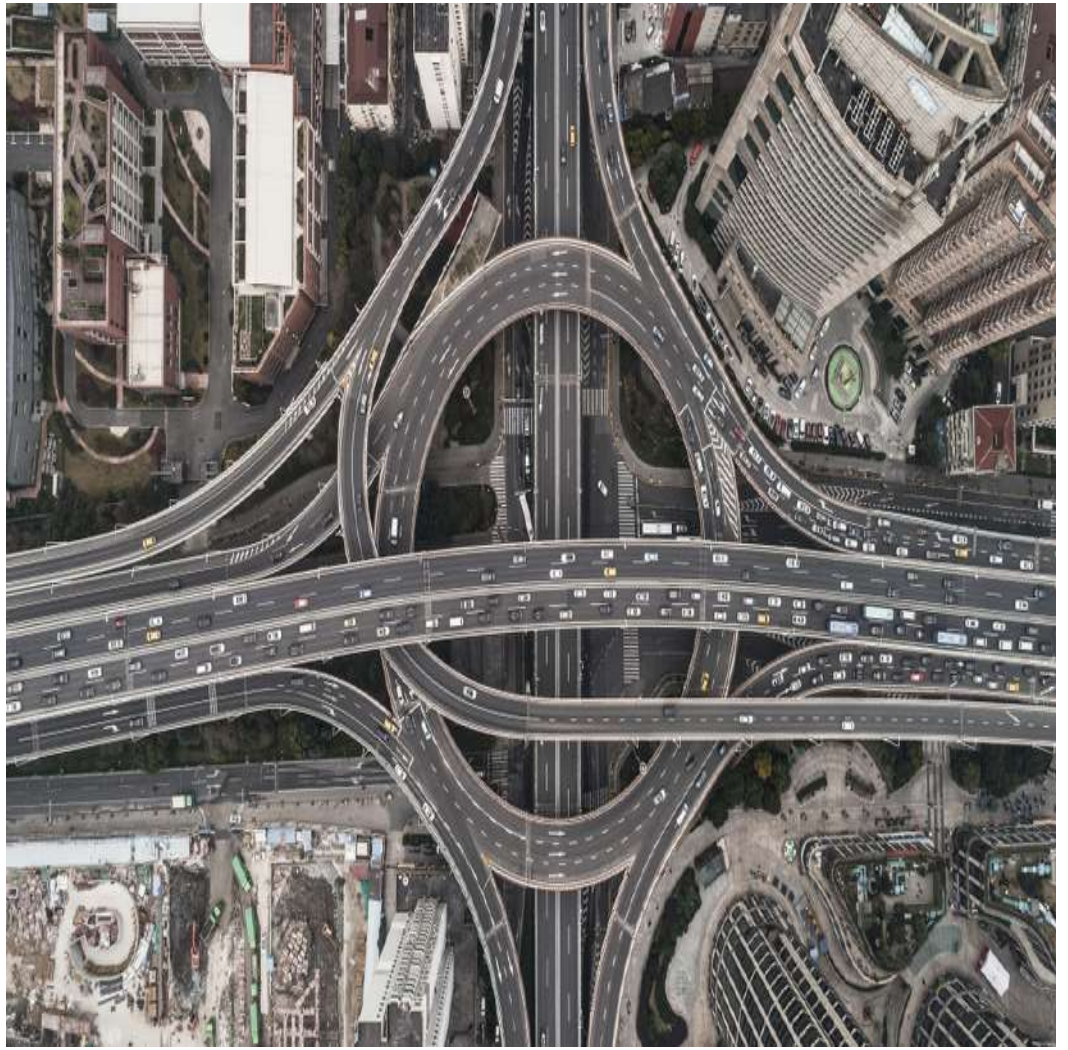
Enforcement - Campaigns - Education
Focus to the five killers:
Speeding, Alcohol, Cell phone, Seat belt, Helmet



Infrastructure

- Smart infrastructure
- New road safety infrastructure management techniques
- Self-explaining roads, forgiving infrastructure, roadside treatment
- New road safety infrastructure measures and investments

- Integration of road safety into transport / traffic / urban plans
- New generation of pedestrian and cyclist arrangements
- Infrastructure and traffic arrangements for PTW
- Special design for the elderly, the vulnerable and for users with specific needs

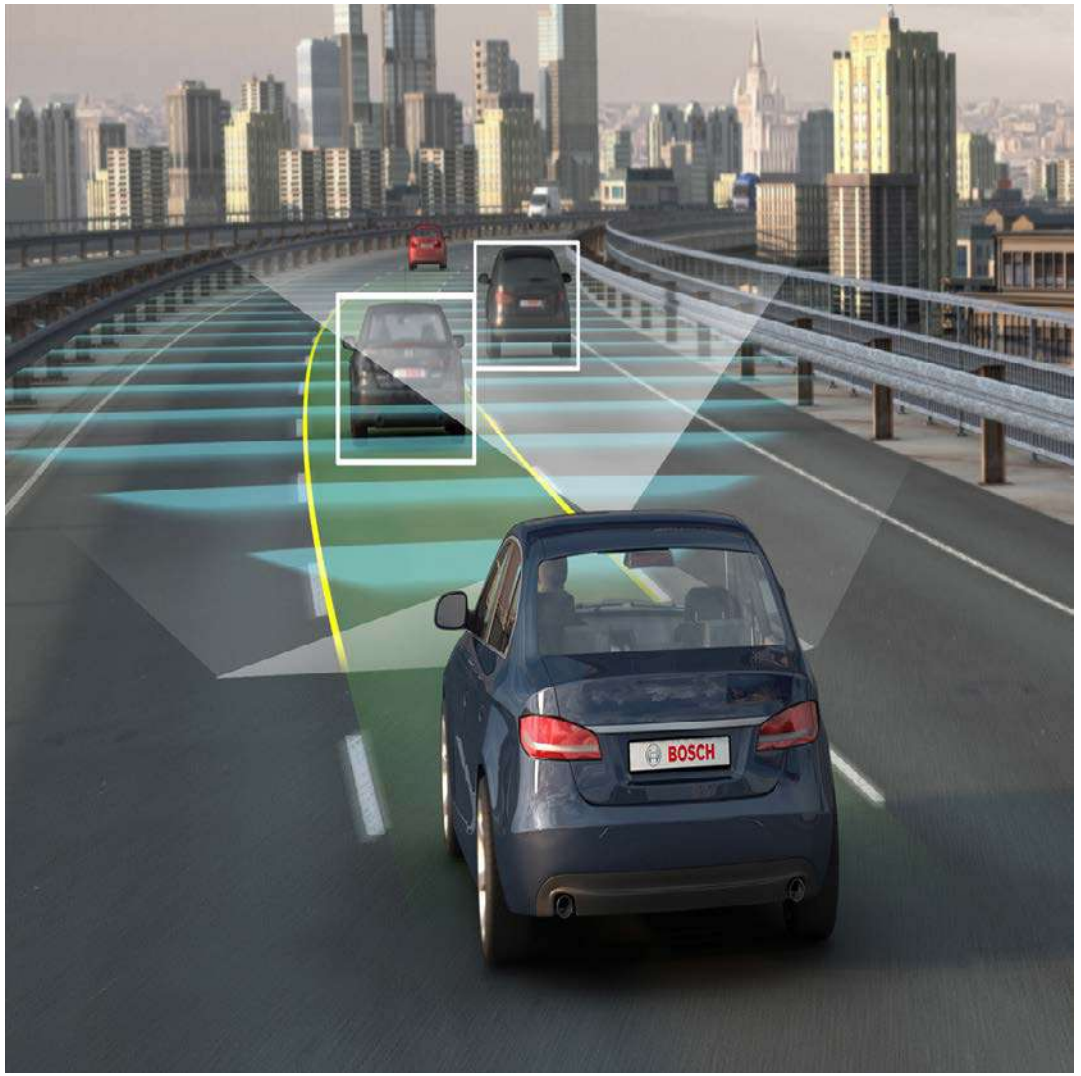


Vehicle technology

- Advanced driver assistance systems with focus on safety (ADAS)
- Safe design of Human Machine/Vehicle Interface (HMI/HVI)
- V2V and V2I communication and co-operative systems
- New active and passive safety equipment

- Better understanding and support of the pre-crash phase
- Improved pedestrian and 2-wheeler detection systems for accident avoidance
- Systems for the protection of (motor)cyclists

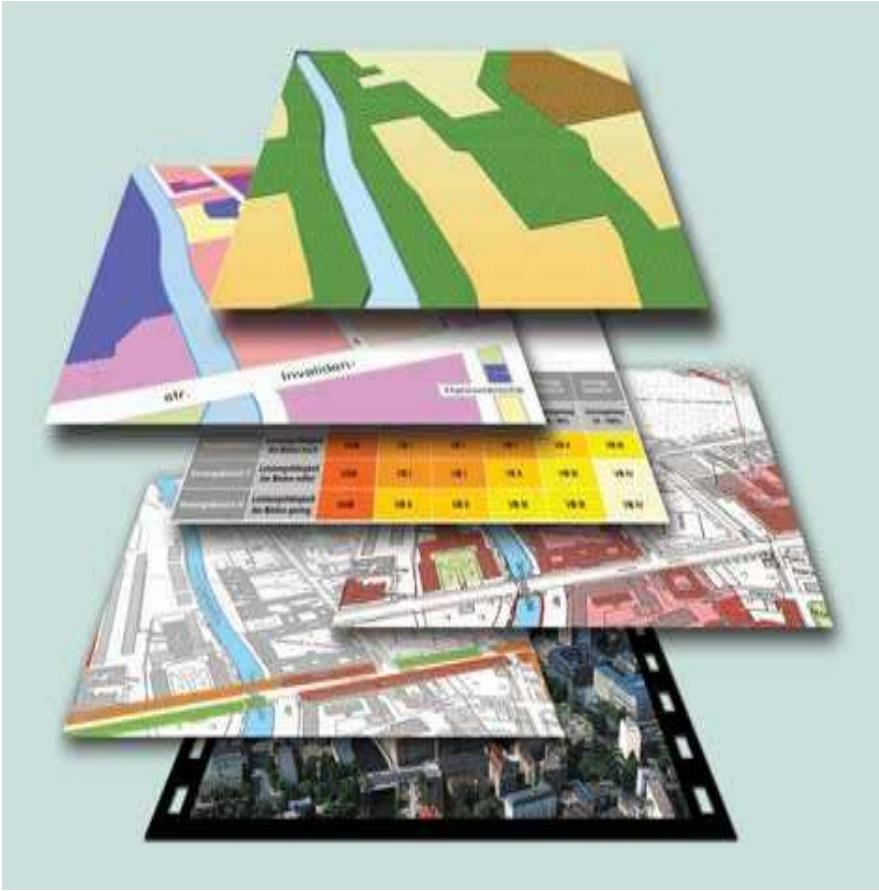
- Safety of new vehicles (hybrid, electric)



Road safety management

- Developing the **Road Safety Culture**
- Targeted **strategies** and integrated policies at city level
- Efficient programmes and **measures**

- Linking road safety **management** with road safety **performance**
- Monitoring **implementation** and effectiveness
- Efficiency assessment and **cost-benefit** (crash modification factors, standardization and transferability)



Urban mobility and road safety choices

The high complexity of the urban environment makes **road safety choices** a very difficult task, attempting to balance conflicting social needs and economical restraints, especially during the economic crisis.

- **Traffic Efficiency** (Speed) Versus **Traffic Safety**
- **Vehicles** Versus **Vulnerable Road Users**
- **Expensive** but safe Versus **Cheap** but unsafe (vehicle, infrastructure, management)
- **Priorities** in policies, measures, research, etc.

The urban road safety choices (1/2)

- **First comes safety** then speed and traffic efficiency.
  - Alternatives for achieving faster transport:
    - channeling of faster traffic to peripheral ring roads outside or near cities
    - development and support of more and better public transport
- Priority should be given to **calmer transport means**.
- **First comes public transport** then cycling and walking and last car traffic.

The urban road safety choices (2/2)

- **Vulnerable users** must be taken into account as fundamental design requirements during the development of road infrastructure and traffic management.

- Maximum separation of **vehicle traffic from pedestrian and cycling traffic** (pedestrian paths, bicycle routes, bus lanes etc.).

- Maximum separation of **passenger traffic from urban freight transport**.

- In complex locations (junctions, etc.):
  - optimum readability of directions,
  - road design consistency (no surprises)
  - a forgiving road environment.

Fundamental directions for urban road safety choices

- Safety should be integrated not only into the development of **Urban Mobility Plans** but also into proposed **Urban Mobility Audits and Guidelines** and be reflected in common targets.
- Plans should adopt a **clear hierarchy of transport users**, with public transport users, cyclists and pedestrians at the top of the hierarchy.
- The **core public transport modes** (bus and rail) are the safest modes of transport.
- Real and perceived safety can have a **profound effect on modal choice** especially in terms of the most sustainable modes of travel - walking and cycling and ability to access public transport.

Some good practices for urban road safety

- Draft guidelines for promoting best practice in **traffic calming measures** (roundabouts, road narrowing, chicanes, road humps, space-sharing).
- Promotion (including legislation) of **passive and active vehicle safety technologies** for the unprotected road users (Intelligent Speed Assistance, car windshield airbags, pedestrian friendly bumpers, etc.).
- Introduction of minimum requirements for **cycle lighting and reflective elements**.
- Support the **assessment of the safety impact** of new traffic rules, e.g. contra-flow cycling, cycles in bus lanes.

Clear road safety targets

- Urban road safety targets should be **clear and not be confused** with other - legitimate but less important – targets of traffic management or ecological driving (traffic police at junctions, cameras on bus lanes etc.).

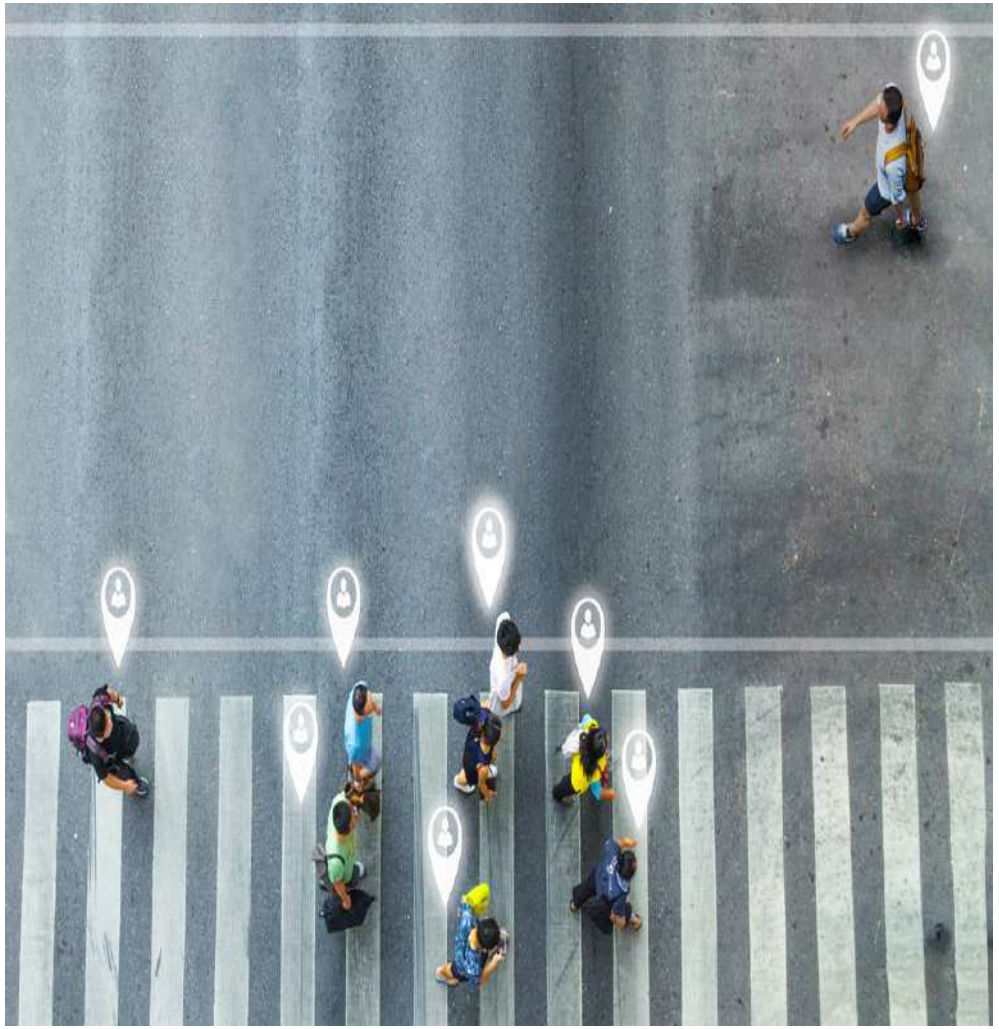
- **Safety and speed** within urban areas are two opposite targets and local communities along with their authorities should choose between them.

The role of Authorities (1/2)

- Set clear **targets** for drastic decrease of speed.
- Implement an efficient **enforcement** program concerning basic traffic violations.
- Re-define **speed limits** for all roads within urban areas, and zones with limits 30km/h and 40km/h.
- Review horizontal and vertical **signs** after dedicated studies.
- Implement a systematic program of inspection and **maintenance** of roads, pavements and roadside elements.

The role of Authorities (2/2)

- Examine the necessary **interventions** on road infrastructure, integrate them into the urban design plans and implement them properly.
- Integrate **guidelines** and "good practice" design of other countries into new city plans, with emphasis on protection of mild circulation.
- Mobilize all local forces in order to change drastically drivers' and pedestrians' **behavior**.
- **Monitor** and publish systematically road accident data and results of the implementation and effectiveness of the respective actions.



Conclusions

- **Urban road safety** should be integrated into the urban mobility plans, equally with environment, energy and mobility concerns, within a long term and sustainable vision.
- Both **authorities and citizens should realise the choices to be made** (with focus on car traffic restriction) and work together and sincerely to implement them.
- **Continuous research** is needed to acquire the necessary knowledge for the support of decision making.

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