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Διεύθυνση Οδικής Κυκλοφορίας και Ασφάλειας

SMART AND RESILIENT ROADS – THE FUTURE

- Adaptable: no need of structural change or retro-fitting of technologies, prefabrication, solar panels
- Automated: self-monitored pavement, integrated sensors and systems, speed control/ direction guidance/ lane change of future vehicles
- Resilient: mitigation of environmental factors (porous pavements, photovoltaic highways/solar roads with LED lighting, modular pavements)

SMART AND RESILIENT ROADS – WHY DO WE NEED THEM?

- Congestion (toll points) and scarcity of resources
- Road maintenance: new pavements, new painting, off-road maintenance of electronic roadway devices
- Real time information to travelers
- ADAS and roadside infrastructure

!! User acceptance, comprehension and reaction to new technology

ROAD USER BEHAVIOUR OPEN AND BIG DATA

- Governments (route planning, traffic control, traffic modelling, congestion management)
- Private sectors (route planning and Logistics, travel industry)
- Individuals (route and travel planning)

Can monitor public transport performance as well as individual driver performance but…

- Privacy issues (individual data, geolocated data)
- Use of data
- Public-private interaction/ standardisation

AUTONOMOUS VEHICLES AND TRAFFIC – THE AMERICAN AND EUROPEAN APPROACH

- American:
  - Levels of autonomous vehicles (L0-L5)
  - Implementation projection: 40 years for saturation, unknown for all new and operating vehicles
  - Costs/problems (increased costs, additional risks, security and privacy concerns, social equity concerns -may reduce other transport modes convenience and safety, reduced employment and business activity, misplaced planning emphasis -walking/cycling/ transit facilities, pricing reforms, urban planning)
  - Benefits (reduce driver stress, mobility for non-drivers, increase road capacity, more efficient parking, increase fuel efficiency, support share vehicle) AMBIGIOUS!!
- IT IS NOT A "PARADIGM SHIFT" -it does not change how we define transport problems; rather it reinforces existing automobile-oriented

AUTONOMOUS VEHICLES AND TRAFFIC – THE AMERICAN AND EUROPEAN APPROACH

- European:
  - Focuses on cooperating driving (V2V and V2I) – needs smart infrastructure
  - Focuses on Automated Road Transport Systems
  - CityMobil: + automating road vehicles could lead to different transport concepts (partly automated car-share schemes, CyberCars, PRT/podcars, BRT), – lack of an implementation framework for cities, absence of a specific legal framework and the unknown wider economic effect.
  - CityMobil2: has successfully demonstrated automated road transport systems in 7 European cites carrying more than 60K passengers on fully automated road vehicles sharing the

AUTONOMOUS VEHICLES AND TRAFFIC

- The interaction with vulnerable road uses (pedestrians and cyclists)
  - Road user behavioural models need further research
  - Individual differences (gender, age, state-of-mind, skills and capabilities, personality)
  - Other road users' behaviour (behavioural adaptation)
  - Traffic rules
  - Informal rules and non-verbal communication

“SMART” VEHICLES, “SMART” ROADS, “SMART” HIGHWAYS, “SMART” INFRASTRUCTURE, “INTELLIGENT” TRANSPORTATION SYSTEMS…

BUT……

- What about humans/drivers?
- Are we smart enough or do we need to get smarter?
- Have we reach our “smart” limits as drivers?