



National Technical University of Athens
Road Safety Observatory

Online
workshop
in the framework of

6TH UN GLOBAL ROAD SAFETY WEEK

17 - 23 May 2021



Streets for Life

Love30



Thursday
20 May
2021

Innovation in Road Safety Research

Road Safety Audit of the Final Road Design of the Hellinikon Metropolitan Pole

Stergios Mavromatis

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Together with:

Tassos Dragomanovits and George Yannis

Objectives

➤ Objectives:

Road Safety Audit of the final road design of the Hellinikon Metropolitan Pole (underpasses, fly-over, main junctions, etc.)

➤ Duration:

38 months (2018 – 2021)
pre-final and detailed design stage

➤ for LAMDA DEVELOPMENT SA.



Background

- **The project involves the design of a pioneering development for Athens**
 - world class Metropolitan Park (2,000,000m²)
 - communal green and open spaces (600,000m²)
 - enhancement of Coastal Front
- **The investment amounts to € 8 bn.**
 - diverse range of residential communities
 - hotels
 - Shopping centres
 - family leisure venues
 - cultural venues, museums
 - significant space for sports, etc.



Road Infrastructure

- **55 km road network**
 - arterials
 - secondary road network
 - interchanges
 - intersections / roundabouts
 - cut & cover areas
- **50 km pedestrian and cycling paths**
- **Re-design of public transportation networks**
 - bus
 - tram
 - metro connection



Methodology

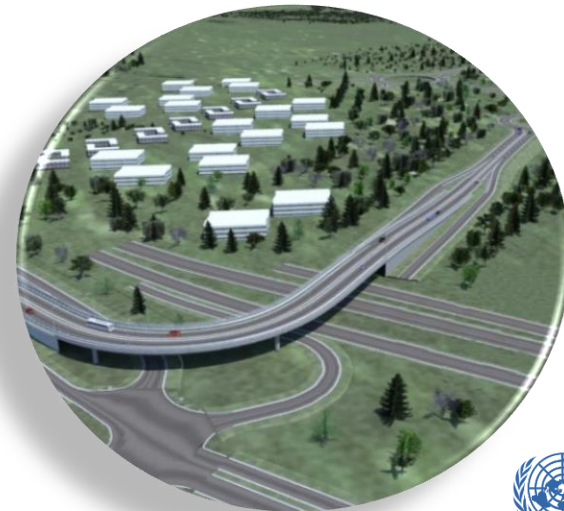
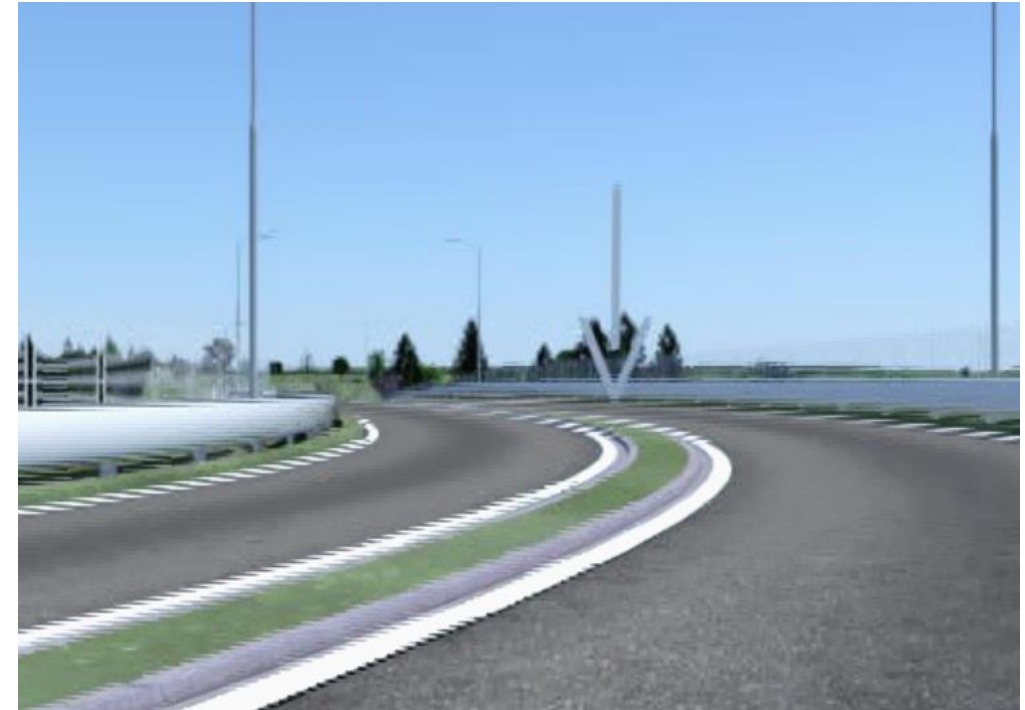
➤ Safe System Approach

- people make mistakes
 - as a result, certain crashes are inevitable
- people are vulnerable
 - limited ability to withstand crash forces without being seriously injured or killed
- we need to share responsibility
 - system designers and people who use the roads must all share responsibility for creating a road system where crash forces do not result in death or serious injury
- we need to strengthen all parts of the system
 - we need to improve the safety of all parts of the system; roads and roadside environment, speeds, vehicles, and road use so that if one part fails, other parts will still protect the people involved



Safe System Approach Adaptation

- **Hierarchizing road network - functional classification**
 - core arteries
 - Arteries
 - collector roads
 - local roads
- **Homogenizing road users based on uniformity of mass and speed**
 - special emphasis on vulnerable road users' safety
- **Predictability regarding road alignments**
 - design consistency
 - continuity
- **Speed management evaluation**
 - interchange exits areas
 - roundabout – intersection areas
 - efficient cross section design per road classification
- **Safety assessment through innovative technological tools**
 - SSD adequacy investigation through 3D Photorealistic software



Scientific and Social Impact

- **Road safety audits (RSA)**
 - identify **infrastructure or traffic related factors** increasing injury or accident risk
 - applied during **all stages**, from planning to early operation
 - checks that the selected scheme is designed and constructed in such a way as to
 - yield the **greatest road safety benefits**
 - detect any **potential hazards** throughout the design and construction
- **Early auditing assists in timely elimination of road safety deficiencies**
 - avoid / minimise wasted design time at later stages
- **Embed Safe System principles in RSAs**
 - humans make **mistakes**
 - humans have **limited ability to withstand crash forces**
 - set **safe** speeds
 - **rank** the design
 - consider crash severity, crash exposure and crash likelihood
 - rate identified risks



Future Challenges

- New directive **EU DIR2019/1936**:
Roads which are part of the Trans-European road network, plus:
 - motorways,
 - other **primary roads**
 - roads **outside urban areas**, not serving bordering properties and completed using EU funding
- Challenges
 - establish guidelines for **audits in urban areas**
 - high traffic volumes
 - high speeds
 - mixed users
 - define primary roads
 - common specifications for **road markings and signs**, to ensure effective readability and detectability for human drivers as well as automated driver assistance systems
 - further guidance on **quality requirements** regarding **vulnerable road users**
 - further guidance for the design of **"forgiving roadsides"** and **self-explaining** and **self-enforcing roads**





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