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

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Together with:
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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.
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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