PHOEBE Project

James Bradford, IRAP

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UK participants in Horizon Europe Project PHOEBE are supported by UKRI grant numbers 10038897 (The International Road Assessment Programme – iRAP) and 10056912 (The Floow).
The need

Urban traffic systems are experiencing an increasing array of dynamic factors

- Models strongly focused on vehicular traffic
- Lack of integration with systems and tools used to manage and develop road networks
The PHOEBE framework

Established and proven traffic simulation tools

Road safety assessment methods

NEW

Dedicated road safety module in the traffic simulation tools

(i) infrastructure safety, speed, modal shift, and induced demand models and performance metrics

(ii) human behaviour models

(iii) application of new and traditional data sources and analytics using artificial intelligence (AI) and machine learning (ML) techniques.
The ambition

SAFETY & SOCIOECONOMIC OUTCOMES

Network-wide (macro) level

Individual (micro) level

New forms of transport

New technologies

Regulatory and behavioural changes

Focused on both vulnerable road users and vehicle occupants

Significant game-changer for urban stakeholders

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**The ambition**

PHOEBE’s methodological framework will be a “blue-print” for how cities can establish and apply the predictive safety assessment framework in an efficient and cost-effective way, providing a theoretical guide on how it works, and how to implement it.
Project Objectives

1. To develop a new, replicable methodology for **dynamic safety prediction and socio-economic evaluation**

2. To **harmonise safety definitions** in traffic simulation models

3. To develop **enhanced and integrated urban risk assessment models and tools**

4. To **embody social components into risk assessments** to take into account changes in human behaviour, and mode and trip choices

5. To **exploit big data and telematics** through AI and ML data analysis techniques that are innovative and efficient

6. To apply the proposed methodological framework and enhanced and integrated predictive modelling tools in an **experimental multi-use-case**
Use cases

ATHENS

VALENCIA

WEST MIDLANDS

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The Methodology

Select

- Locations would be selected for simulation to understand how the changes the city is planning will work in the context of other trends.

Simulate

- Data gathered to establish baseline conditions and then simulate the expected changes to the road environment.

Evaluate

- The results are then extrapolated to the network-wide level to estimate the overall impact of the forecast changes and impacts are calculated.

Extrapolate

- The outputs would then be evaluated to produce dynamic safety scores. The results can be used to rerun and refine simulated scenarios and validate the results.
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THANK YOU!

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