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LEVITATE
Development of a Policy Support Tool to assess Societal Level Impacts of Connected and Automated Vehicles

Event: Annual Polis Conference 2020
Location: Virtual Event
Date: 30 November - 3 December 2020

LEVITATE has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 824361.
The Levitate Project

LEVITATE focuses on the development of a new impact assessment framework, in order to enable policymakers to manage the introduction of connected and automated transport systems, maximise the benefits and utilise the technologies to achieve societal objectives

- **Project partners:**
  LOUGH (UK), AIT (AT), AIMSUN (ES), NTUA (EL), POLIS (BE), SWOV (NL), TOI (NO), TfGM (UK), City of Vienna (AT), QUT (AU), TJU (CN), UMTRI (US)

- **Duration of the project:**
  36 months (December 2018 – December 2021)

- **Framework Program:**
  Horizon 2020 - The EU Union Framework Programme for Research and Innovation – Mobility for Growth
Aims

• To consolidate the outputs of WPs 4-7 into an **overall framework** for the assessment of impacts, benefits and costs of CATS, for different automation and penetration levels and on different time horizons;

• To **analyze user needs** for a decision support tool aiming to assist in the analysis of urban policy scenarios and targets;

• To develop and implement a **toolkit** and a **decision support** tool, allowing the testing of various policy scenarios on the basis of the needs of relevant stakeholders, incorporating both **forecasting** and **backcasting** approach;

• To provide **policy recommendations**.
PST Structure

Policy Support Tool (PST) - release 5 [June 2020]

Knowledge Module
- Bibliography
- Levitate results
- Tools Documentation
- Guidelines

Estimator Module
- Forecasting sub-system
  - Sub-use case 1
  - Sub-use case 2
  - Sub-use case 3
  - Sub-use case 4
  - Sub-use case 5
  - Sub-use case ......
- Backcasting sub-system
  - Employment of forecasting in an iterative process ("goal seek"), testing alternative policy interventions until the desired impact - policy goal is obtained

Dynamic
- Interactive
- Javascript Design
- Sub-systems:
  - Forecasting
  - Backcasting
  - CBA module
  - Case studies

Static
- Searchable
- Components:
  - Bibliography
  - Results
  - Tools
  - Guidelines and policy recommendations
PST Knowledge Module: Overview [1/2]

PST Knowledge Module Contents – based on the NTUA conceptual framework:

1. **Bibliography:** Relevant literature concerning impact assessments of CATS
   - Systematic literature review across the project and one per use case
   - The documentation of each sub-use case
   - Short synopsis summarizing each use-case/sub use-case

2. **Project results:** Case studies, impact assessments
   
   For each case study:
   - Information regarding the scenarios and baseline conditions
   - Assumptions and limitations relevant to each case study to be explained in detail there-in as well
   - Showcasing of case study results
3. Documentation of tools: Toolbox of Levitate methods
   For each methodology (Microsimulation, Delphi, System Dynamics):
   • Information regarding the methodological background, much of which is existing on presentations
   • Assumptions and limitations relevant to each methodology to be explained in detail as well

4. Guideline excerpts: Guidelines and policy recommendations regarding CATS
   • Explanations and tutorials on the use of the PST Estimator modules
   • Overall recommendations to cities from project results
   • Additional recommendations from literature or other inputs if necessary

The PST Knowledge Module will be static & searchable
PST Forecasting Estimator

- **Step 1:** Selection of use case and sub-use case:
- **Step 2:** Definition of initial values
- **Step 3:** Definition of base scenario:
- **Step 4:** Details of sub-use-case implementation
- **Step 5:** Estimation of forecasted impact indicator values for reference scenario (without SUC)
- **Step 6:** Estimation of forecasted impact indicator values for intervention scenario (with SUC)
- **Step 7:** SUC impact estimation – presentation of results
**PST Backcasting Estimator**

**Functionality:** The backcasting process is envisioned to be the inverse of forecasting

**Specifically:**
1. With what measures can one reach impact goal $X$ in year $Y$?
2. What year would they need to be taken?
3. What happens when two measures are combined?

**Current approach:** The creation of Impact Modification Factors (IMFs) and their **combinations** in pairs drawing from the HSM philosophy for CMFs
Current Achievements

• Contribution in the **definition** of CATS sub-use cases, parameters and impacts, considering both user needs and practical project limitations.

• **Standardization** of WPs 5-7 impact estimation outcomes and of assumptions at project level.

• Continuous development and updates of **PST framework**, as the project results gradually mature.

• Development of **1st Demo Forecasting Excel** with guessed relationships.

• Development of **2nd Demo Forecasting Excel** with actual estimated relationships, for one SUC and six impacts.
Future Plans

- Finalization of the PST backcasting estimator
- Development and integration of the PST CBA estimator
- Development of the online PST structure and preparing a highly ergonomic, eye-catching user interface
- Test, validate & improve all PST estimators
- Integrate information and project results into the static knowledge module of the PST
- Develop policy recommendations
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