D2.6 – Policy Support Tool user guide

Deliverable D2.6 – WP2 – Lead: POLIS, Support: SWOV

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Work package2, Deliverable D2.6

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Revision history

Date	Version	Reviewer	Description
20/04/2020	Preliminary draft 1	Suzanne Hoadley, Balazs Nemeth, Maria Jose Rojo	Review round 1 – Feedback

14/05/2020	Preliminary draft 2	Hitesh Boghani, Apostolos Ziakopoulus, Bin Hu	Review round 2 – Rating
04/09/2020	Final report	Balazs Nemeth, Sanne van Gils, Suzanne Hoadley	Final Visualisation
30/05/2022	Updated Final Deliverable	Juliette Thijs, Mark Meyer, Sanne van Gils, Pete Thomas – Loughborough University ➔ EC	Video details added in Appendix B and C. Final Deliverable

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Executive summary

This Levitate project Deliverable D2.6 is composed of two sections that help users' navigate the Policy Support Tool (link: https://www.ccam-impacts.eu/). The first section is composed of a figure that lays out the parameters the user can control, and the expected results and impacts delivered by the tool (Appendix A). The second section guides the user through every step of the forecasting and backcasting tools, in addition to showing what modules are available on the website, through three tutorial videos (Appendix B and C).

1 Introduction

1.1 Background

Connected, cooperative, and automated mobility (CCAM) services and technologies are expected to be introduced in increasing numbers over the next decade. Automated vehicles have attracted the public imagination and there are high expectations in terms of safety, mobility, environment and economic growth. With such systems not yet in widespread use, there is a lack of data and knowledge about impacts.

Furthermore, the potentially disruptive nature of highly automated vehicles makes it very difficult to determine future impacts from historic patterns. Estimates of future impacts of automated and connected mobility systems may be based on forecasting approaches, yet there is no agreement over the methodologies nor the baselines to be used. The need to measure the impact of existing systems as well as forecast the impact of future systems represents a major challenge.

Finally, the dimensions for assessment are themselves very wide, including safety, mobility and environment but with many sub-divisions adding to the complexity of future mobility forecasts.

The aim of the LEVITATE project is to prepare a new impact assessment framework to enable policymakers to manage the introduction of connected and automated transport systems, maximise the benefits and utilise the technologies to achieve societal objectives.

1.2 LEVITATE Project

Societal Level Impacts of Connected and Automated Vehicles (LEVITATE) is a European Commission supported Horizon 2020 project with the objective to prepare a new impact assessment framework to enable policymakers to manage the introduction of connected and automated transport systems, maximise the benefits and utilise the technologies to achieve societal objectives.

Specifically LEVITATE has four key objectives:

1. To establish a **multi-disciplinary methodology** to assess the short, medium, and long-term impacts of CCAM on mobility, safety, environment, society, and other impact areas. Several quantitative indicators will be identified for each impact type

2. To develop a range of **forecasting and backcasting** scenarios and baseline conditions relating to the deployment of one or more mobility technologies that will be used as the basis of impact assessments and forecasts. These will cover three primary use cases – automated urban shuttle, passenger cars and freight services.

3. To apply the methods and **forecast the impact of CCAM** over the short, medium, and long term for a range of use cases, operational design domains and environments and an extensive range of mobility, environmental, safety, economic and societal indicators. A series of case studies will be conducted to validate the methodologies and to demonstrate the system.

4. To incorporate the established methods within **a new web-based policy support tool** to enable city and other authorities to forecast impacts of CCAM on urban areas. The methods developed within LEVITATE will be available within a toolbox allowing the impact of measures to be assessed individually. A Decision Support System will enable users to apply backcasting LEVITATE has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 824361. methods to identify the sequences of CCAM measures that will result in their desired policy objectives.

1.3 Purpose of this Deliverable

This deliverable is divided in two sections.

First, a visualisation was produced to help Policy Support Tool (PST) users understand what the platform offers through a description of what the user "gives" and "gets". This figure was made before the tool was finalized and published.

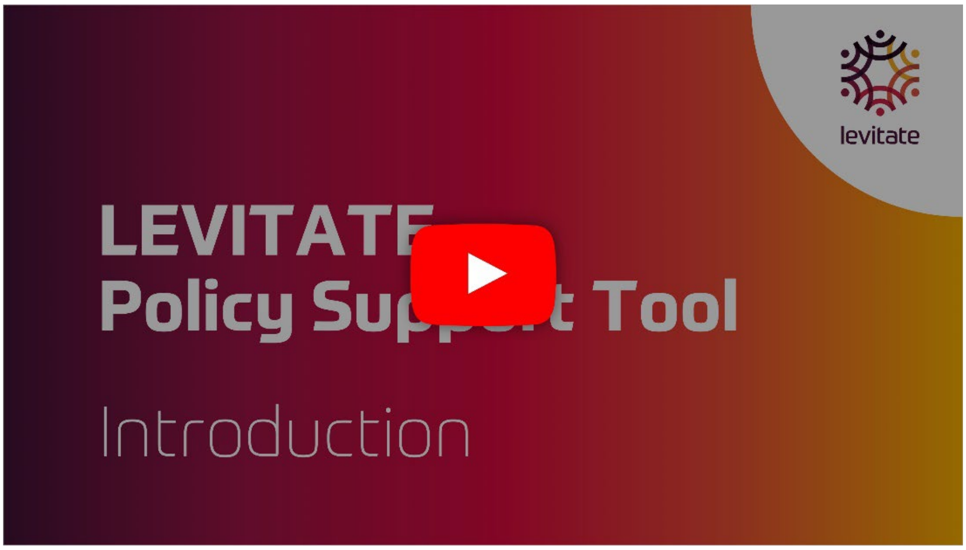
The second output came once the Policy Support Tool was completed. It is a set of three Policy Support Tool tutorial videos to guide users in understanding: (1) what is available on the PST website, (2) how to use the forecasting tool and (3) how to use the backcasting tool. More specifically, the first video showcases what the three modules consist of and the kind of questions they can help users answer. The second and third videos are based on a fictional story or case study where an individual has a CCAM-related question and walks through the tools to find answers.

The script and videos were co-created by SWOV and POLIS through video screen captures, animated video extracts, and a voice-over. They are available on SWOV's Youtube channel and posted on both the LEVITATE and PST websites.

Appendix A - Visualisation of the Policy Support Tool

Appendix B - Links to the videos of the Policy Support Tool

Video 1: Introduction
Link: https://www.youtube.com/watch?v=1cz2LCPI1lg

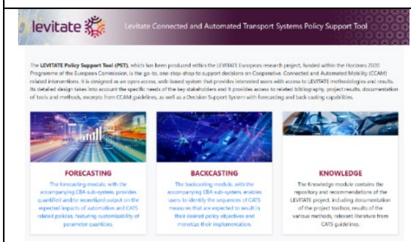


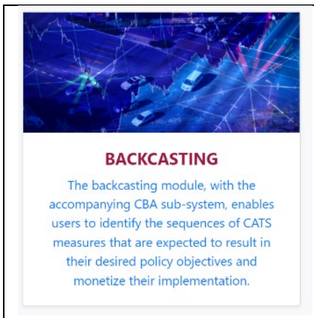
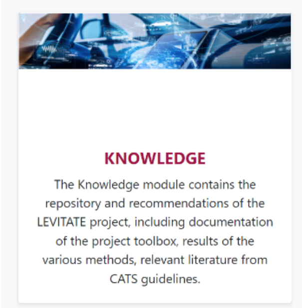
Video 2: Forecasting
Link: https://www.youtube.com/watch?v=BOIJ4Qm6HEs

Video 3: Backcasting
Link: https://www.youtube.com/watch?v=eFv6pKwGhrs

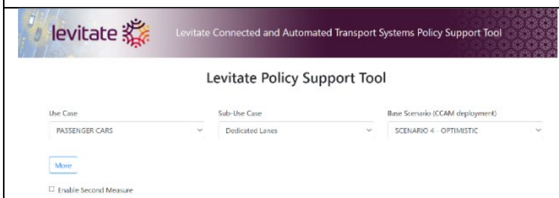
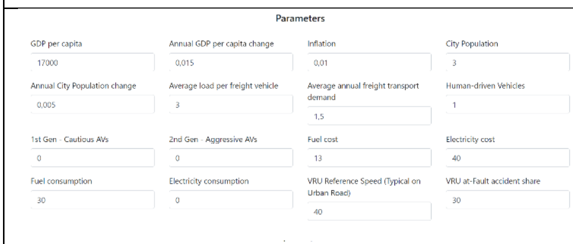
Appendix C - Scripts of the videos of the Policy Support Tool

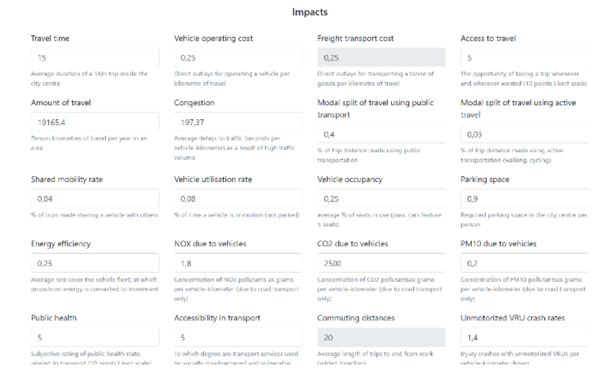
VIDEO 1: Introduction to the tool

VISUALS	VOICE OVER
 	How can cities regulate Connected and Automated mobility? What tools can we use to ensure these new mobilities are in line with social, environmental, and economic goals?
 	The LEVITATE Policy Support Tool (PST) is a go-to, one-stop shop that supports decisions on Cooperative, Connected and Automated Mobility, otherwise known as CCAM. It is designed as an open access, dynamic, web-based system for city planners, engineers, researchers, NGOs, and anyone interested in CCAM. It gives access to:
 	1. One, A forecasting tool that enables users to estimate, in a quantified way, the impact of CCAM policies on urban spaces. This tool can help you answer the questions: *How will CCAM impact my city?* *What is the cost-benefit analysis of different CCAM policy interventions?*

	2. Two, a backcasting tool which gives users the opportunity to identify CCAM measures to reach desired policy objectives. This tool can help you find answers to the question: *What policies and measures related to Connected and Automated Vehicles can be taken to reach a policy goal?*
	3. And three, a library of LEVITATE's policy recommendations, key results, methodologies, and other central documents.
	These three resources were developed as part of the EU-funded project LEVITATE. They are available at https://www.ccam-impacts.eu/

VIDEO 2: Forecasting Tool

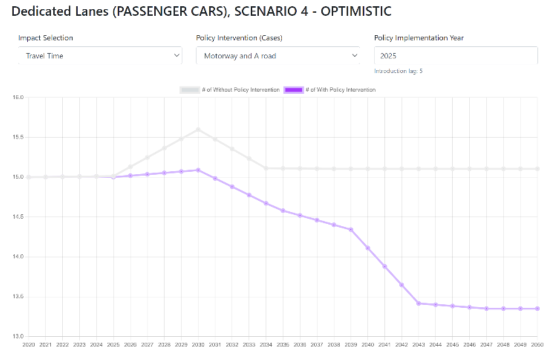
	Hello, I am a data analyst that works for Levitate Town. I want to know what the impacts of **dedicated lanes** for automated **Passenger Cars** will be in the coming years if there is a **high CCAM deployment**.
	First, I will fill in these drop-down options. For the automation use case, which is the overarching CCAM policy area, I want to analyse "passenger cars". My sub-use case – the specific policy intervention or technology - is "dedicated lanes". Finally, I want to look at an optimistic base scenario to find out what the policy implications will be with a rapid CCAM deployment in my city.
	Next, I am going to add the data from LEVITATE City in these **parameters.** This will ensure that the final results will be relevant and transferable. However, it is also possible to use the PST tool without customizing this data. *(Data added)* *GDP per capita: 25 000* *Annual GDP per capita change: 0.020* *City population: 5* *Average load per freight vehicle: 2* *Fuel cost: 15* *Fuel consumption: 25*



Now, I will personalize two impact values. Again, I could leave the pre-defined ones.

Starting values mostly affect the corresponding impacts. Here, I will change the values of **travel time** and **C02 emissions due to vehicles** because these are the impacts I am most interested in.

Let's click on Submit.

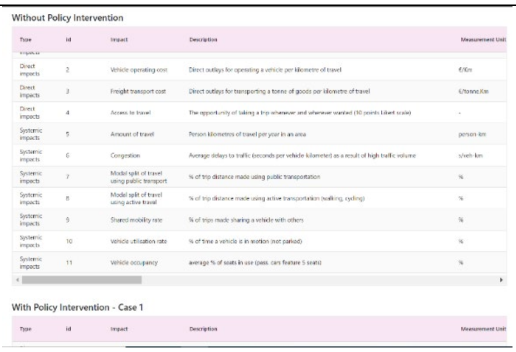


I am almost there. I need to fill in these boxes before I get my results.

- As an impact, I am curious to know how dedicated lanes for automated passenger vehicles will impact "travel time"
- Specifically, I will take the case of dedicated lanes on a motorway and A-road
- And I want to see what the impacts will be if the policy is implemented in 2025

In this graphic, I can compare the forecasted impacts on **travel time** of the baseline development, that's without my intervention, which is the grey line, with those of my policy intervention, or the purple line.

The dedicated lanes policy intervention would reduce travel time by just over 3 min on average for a 5km trip inside the city center between 2025 and 2050.



Please scroll to the right to see the results.

For more quantitative information, I can look at the tables that show all 23 impacts examined in Levitate.

They describe the percentage change of each impact from the initial value for each year in the 2020 to 2050 time horizon.

For instance, we can see that travel time for passenger vehicles would decrease by about

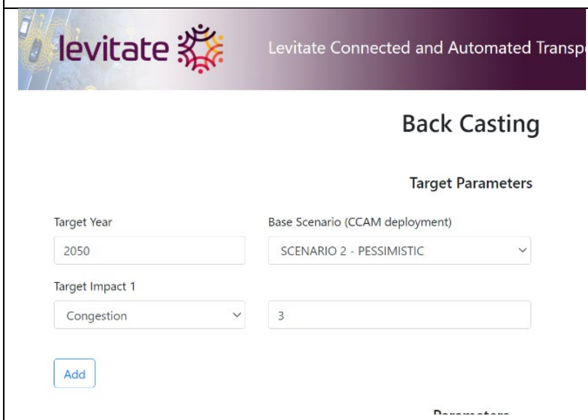
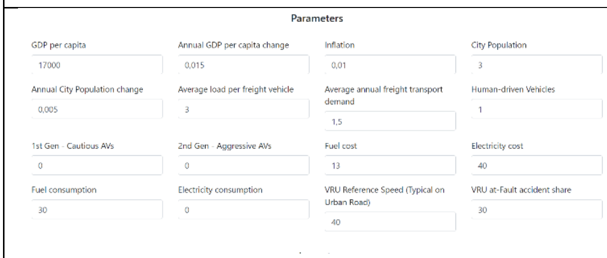
<table>
<tr><td></td><td>12% in 2040 compared to 2021 levels.</td></tr>
<tr><td>
</td><td rowspan="2">LEVITATE's Policy Support Tool has been helpful. As a data analyst, I can anticipate and plan the impacts of Connected and Automated Transport systems on my city.

Do you want to try out the LEVITATE Policy Support Tool?

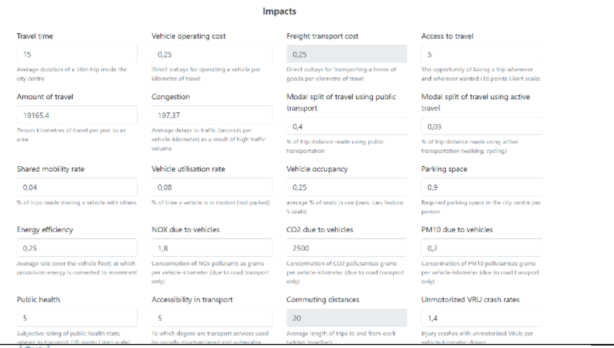
You are just a click away. Follow the link in the video's description.</td></tr>
<tr><td>
</td></tr>
</table>

VIDEO 3: Backcasting Tool

<table>
<tr>
<td>
</td>
<td>I am a researcher at Levitate university working on mobility. I want to know what measures need to be put in place to ensure Cooperative, Connected and Automated Mobility, otherwise known as CCAM, decreases congestion by 2030 in a scenario with a low deployment rate of CCAM.

Before running the backcasting tool, I used the forecasting tool to explore the range of values I could expect to attain for each impact under different policy scenarios.</td>
</tr>
<tr>
<td>
</td>
<td>I am on the backcasting tool page of the PST website. To start off, I will select my target parameters:
I want my policy vision to be reached by 2030
And I want to focus on congestion
Using a pessimistic CCAM scenario, in other words a low CCAM deployment rate
Finally, I want to look at reducing congestion from the initial provided value of 197 delay seconds per vehicle kilometer to 170 for my case study.
I could add up to five additional target impacts by clicking on this button (Add), but it won’t be necessary for my analysis today.</td>
</tr>
<tr>
<td>
</td>
<td>Next, let's look at the parameters. I will now add my case city’s data as I want the results to be as much as possible in line with reality.

(Add this data)
GDP per capita: 25 000
Annual GDP per capita change: 0.020
City population: 5
Average load per freight vehicle: 2
Fuel cost: 15
Fuel consumption: 25</td>
</tr>
</table>



Here I will keep the pre-defined impact values, although I could tailor them if needed.

Let's click on 'Submit'.

Great, I have my results!

In this table, I can see all policy interventions with their respective baselines as rows. Each row is marked as "true", if the desired target for congestion is attained, and "false" if it is not.

In this example, my target of reduced congestion can be achieved with the GLOSA-related baseline and GLOSA on 2 and 3 intersections (but not on 1). Looking at a different policy, the target is reached for as well as the baseline & fully automated freight delivery scenario, but not for the semi-automated freight delivery.

LEVITATE's PST tool has been valuable for my research project to study how to anticipate automation and plan to reach a certain policy objective.

Do you want to test the PST tool out?

Click on the link in the bio