George Yannis, Anastasios Dragomanovits, Julia Roussou

Policy Support Tool

SRG Workshop
Brussels

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

Presentation Overview

1. PST implementation
2. PST assumptions
3. Forecasting estimator: Interaction with user
4. Forecasting estimator demo
5. Next steps

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PST Implementation

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Policy Support Tool (PST)

Knowledge Module

Bibliography

Levitate results

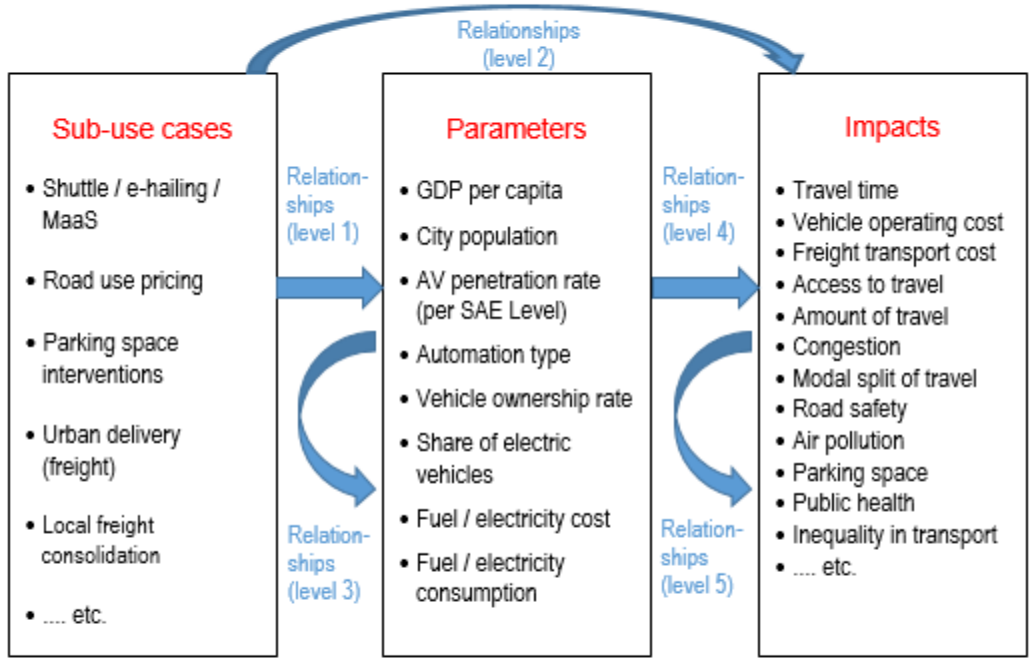
- use case results
- predefined impact assessment scenarios

Tools Documentation

Guidelines

Estimator Module

Forecasting sub-system (per 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
TO BE DEFINED

Sub-use cases - Parameters - Impacts

- 14 sub-use cases

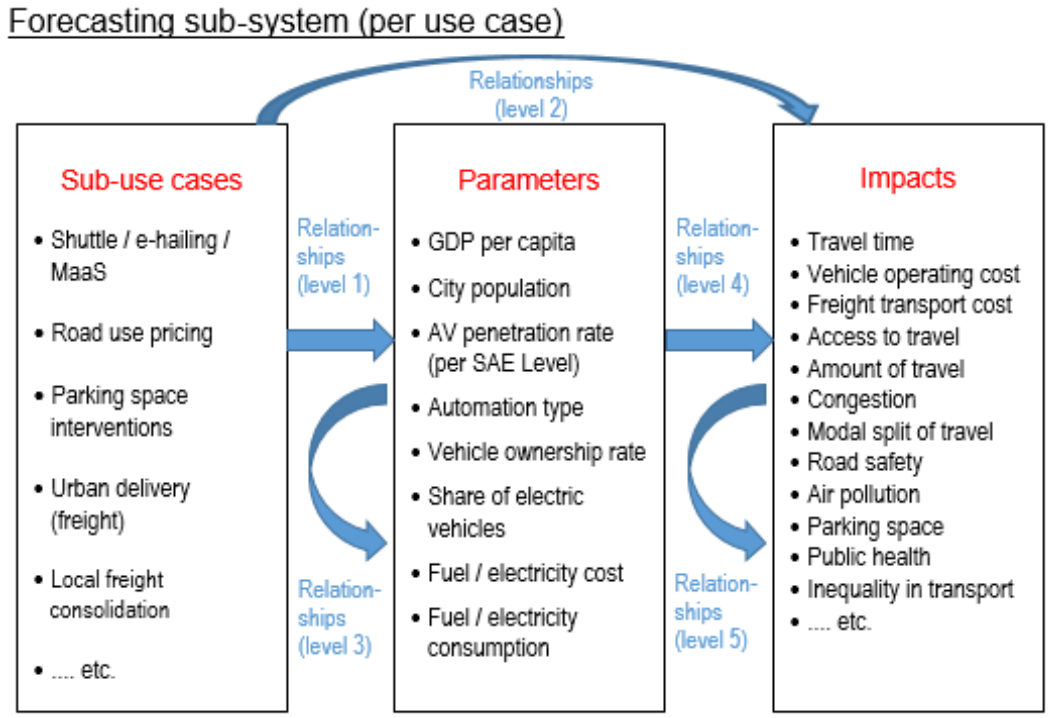
decided in the Hague Plenary Project meeting

- 23 parameters

based on the sub-use cases and the impacts

- 20 impacts

based on project deliverables and on a mini-consultation round with cities



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Sub-use Cases

no.	Shuttle / e-hailing / MaaS	Description
1	Introduction of station to station AV shuttles	Automated urban shuttles travelling between fixed station.
2	Introduction of anywhere to anywhere AV shuttles	Automated urban shuttles travelling between different, not fixed locations.
3	Introduction of last-mile AV shuttles	Automated urban shuttles providing convenient first/ last mile solutions, complementing public transport.
4	Introduction of automated ride sharing	Automated passenger cars booked by multiple passengers (using a smartphone app) to travel between convenient points. Passengers' final destinations could be near each other, but not necessarily the same.

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Sub-use Cases

no.	Road use pricing	Description
5	Introduction of a dynamic city toll for all empty vehicles	A dynamic fee is applied to every empty vehicle inside the city center (depending on area, traffic load and time of day).
6	Introduction of a static city toll for non-automated vehicles	A fixed fee is applied to all non-automated vehicles entering the city center.
7	Introduction of a static city toll for all vehicles	A fixed fee is applied to all vehicles entering the city center.
8	Introduction of a dynamic city toll for non-automated vehicles	A dynamic fee is applied to all non-automated vehicles inside the city center (depending on area, traffic load and time of day).
9	Introduction of a dynamic city toll for all vehicles	A dynamic fee is applied to all vehicles inside the city center (depending on area, traffic load and time of day).

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Sub-use Cases

no.	Parking space interventions	Description
10	Replace long term parking space with space for public use	On-street long term parking inside city center is reduced by the designated rate, and the space previously used for parking is transformed to sidewalks, planted areas, etc.
11	Replace long term parking space with driving lanes	On-street long term parking inside city center is reduced by the designated rate, and the space previously used for parking is transformed to additional driving lanes
12	Replace long term parking space with short term parking space	On-street long term parking inside city center is reduced by the designated rate, and transformed to short term parking space

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Sub-use Cases

no.	Freight specific sub-use cases	Description
13	Automated urban freight delivery	Delivery of parcels and goods in urban area is automated.
14	Local freight consolidation	Automated freight consolidation using hubs and terminals with the goal to increase transport efficiency, especially in dense urban areas.

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Parameters

no.	Description	CATS related	Use Case	Unit of Measurement	Default Initial Value (can be changed by user)
1	GDP per capita	no	all	€	15.000
2	Annual GDP per capita change	no	all	%	1,50%
3	Inflation rate	no	all	%	1,00%
4	City Population	no	all	million persons	3
5	Annual City Population change	no	all	%	0,50%
6	Vehicle ownership rate	yes	passenger car	no. of vehicles/person	0,2
7	Urban shuttle fleet size	yes	automated urban transport	no. of vehicles	300
8	Freight vehicles fleet size	yes	freight transport	no. of vehicles	100

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Parameters

no.	Description	CATS related	Use Case	Unit of Measurement	Default Initial Value (can be changed by user)
9	Average load per freight vehicle	no	freight transport	tones	3
10	Average annual freight transport demand	no	freight transport	million tones	1,5
11	Annual freight transport demand change	no	freight transport	%	0,50%
12	AV penetration: Levels 0-2	yes	all	%	100%
13	AV penetration: Level 3	yes	all	%	0%
14	AV penetration: Level 4	yes	all	%	0%
15	AV penetration: Level 5	yes	all	%	0%

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Parameters

no.	Description	CATS related	Use Case	Unit of Measurement	Default Initial Value (can be changed by user)
16	Connected AVs (of Levels 4 & 5)	yes	all	%	0%
17	Freight CAV fleet share	yes	freight transport	%	0%
18	Urban shuttle CAV fleet	yes	automated urban transport	%	0%
19	Electromobility ratio in non-AV vehicles	no	passenger car	%	5%
20	Fuel cost	no	all	€ / lt	1,50
21	Electricity cost	no	all	€ / KWh	0,10
22	Fuel consumption	yes	all	lt / 100Km	8,00
23	Electricity consumption	yes	all	KWh / 100Km	13,00

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Impacts

no.	Direct Impacts	Description / Measurement	Unit of Measurement	Default Initial Value (can be changed by user)
1	Travel time	Average duration of a 5Km trip inside the city centre	min	15
2	Vehicle operating cost	Direct outlays for operating a vehicle per kilometre of travel	€/Km	0,25
3	Freight transport cost	Direct outlays for transporting a tonne of goods per kilometre of travel	€/tonne.Km	0,25
4	Access to travel	The opportunity of taking a trip whenever and wherever wanted (10 points Likert scale)	-	5

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Impacts

no.	Systemic Impacts	Description / Measurement	Unit of Measurement	Default Initial Value (can be changed by user)
5	Amount of travel	Person kilometres of travel per year in an area	Km	6.000
6	Congestion	Average delays to traffic (per vehicle.trip) as a result of high traffic volume	min	10,0
7	Modal split of travel using public transport	% of trip distance made using public transportation	%	40,0%
8	Modal split of travel using active travel	% of trip distance made using active transportation (walking, cycling)	%	3,0%

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Impacts

no.	Systemic Impacts	Description / Measurement	Unit of Measurement	Default Initial Value (can be changed by user)
9	Shared mobility rate	% of trips made sharing a vehicle with others	%	4,0%
10	Vehicle utilisation rate	% of time a vehicle is in motion (not parked)	%	8,0%
11	Vehicle occupancy	average % of seats in use	%	35,0%

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Impacts

no.	Wider Impacts	Description / Measurement	Unit of Measurement	Default Initial Value (can be changed by user)
12	Parking space	Required parking space in the city centre per person	m2/person	0,90
13	Road safety	Number of injury accidents in an area	accidents/year	2.000
14	Energy efficiency	Average rate (over the vehicle fleet) at which propulsion energy is converted to movement	%	25%
15	NOx due to vehicles	Concentration of NOx pollutants per cubic metre of air (due to road transport only)	µg/m3	45
16	CO_2 due to vehicles	Concentration of CO_2 pollutants per cubic metre of air (due to road transport only)	µg/m3	25

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Impacts

no.	Wider Impacts	Description / Measurement	Unit of Measurement	Default Initial Value (can be changed by user)
17	PM_{10} due to vehicles	Concentration of PM_{10} pollutants per cubic metre of air (due to road transport only)	µg/m3	35
18	Public health	Subjective rating of public health state, related to transport (10 points Likert scale)	-	5
19	Inequality in transport	To which degree are transport services used by socially disadvantaged and vulnerable groups, including people with disabilities (10 points Likert scale)	-	5
20	Commuting distances	Average length of trips to and from work (added together)	Km	20

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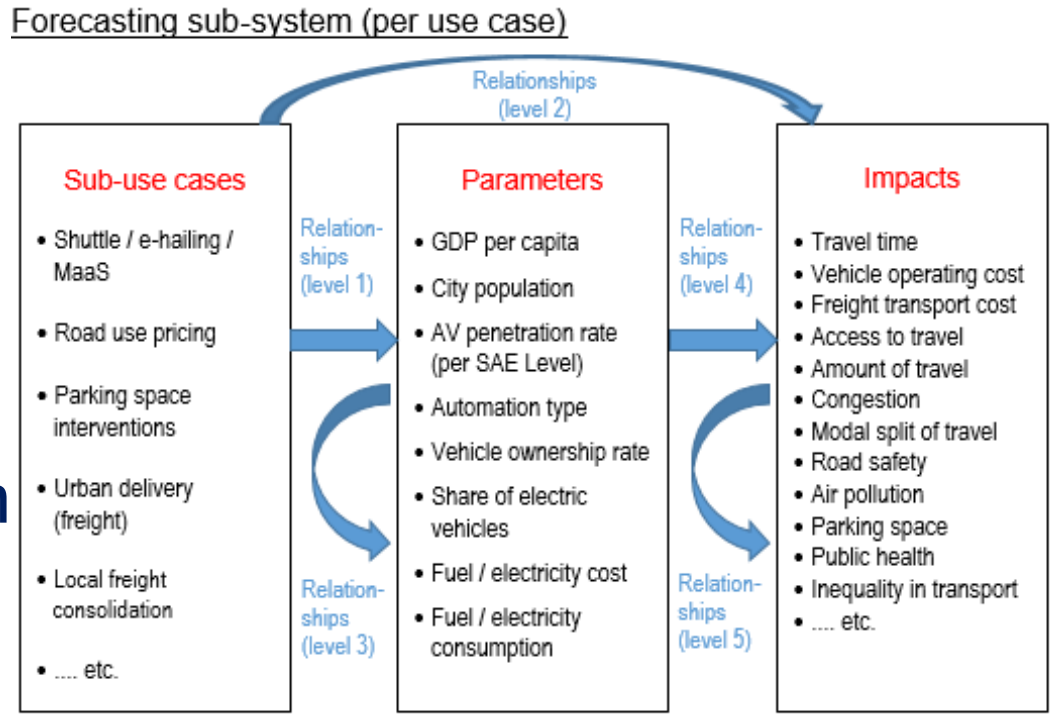
Relationships

- Level 1 – Sub-use Cases to Parameters
- Level 2 – Sub-use Cases to Impacts
- Level 3 – Parameters to Parameters
- Level 4 – Parameters to Impacts
- Level 5 – Impacts to Impacts

Methods:

- Literature Review
- Simulation
- Delphi Panel - Expert Estimation
- System Dynamics
- Operations Research



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Relationships

- Methods to estimate applicable relationships (PST rel.4):

			Estimation methods				
Relationships	Possible (total)	not applicable (n/a)	delphi panel	simulation	experts estimation	operations research	literature review
Level 1	322	267	41	0	0	14	0
Level 2	280	171	19	65	5	10	10
Level 3	529	507	4	0	10	0	8
Level 4	460	312	51	54	19	0	24
Level 5	400	358	6	27	1	0	8
SUM:	**1.991**	**1.615**	**121**	**146**	**35**	**24**	**50**

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PST assumptions

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PST assumptions (1/4)

1. Only **urban environment** is considered (according to key objective no.1 of the proposal).

2. Since the PST aims to assist city authorities in decision making, only **sub-use cases that can be applied by city authorities** have been included. For example, banning parking in the city center is considered, but providing economic incentives for purchasing an AV is not.

PST assumptions (2/4)

3. All **AVs** are assumed to be **electric**. With regards to conventional vehicles, different EV penetration rates are forecasted according to existing literature.

4. In order to enable the impact assessments, **predefined base scenarios** (Business-As-Usual) are established, concerning the penetration of autonomous vehicles, of connected vehicles and of electric vehicles. The user will also be able to create a **custom scenario**.

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PST assumptions (3/4)

5. Impacts included in the PST framework (rel.4) have been selected from D3.1, with modifications where necessary to ensure that **impact indicators** are measurable.

6. Each use case (passenger cars, urban transport, freight transport) is considered **independently** of the other two, but a common set of parameters and impacts is used. For example, while considering the urban transport use case, it is assumed that only urban shuttles will be autonomous, and passenger cars and freight vehicles will operate as in the BAU scenario.

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PST assumptions (4/4)

7. A **time-horizon** of 30 years is considered, starting from 2020 and ending in 2050. 5-year intervals considered in the DEMO version - yearly intervals in the final version.

8. It is assumed that all required **technologies** to implement each sub-use case **will be available** during the selected by the user time of intervention, e.g. technologies enabling dynamic city tolling (e.g. GPS monitoring of car position), etc.

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Forecasting estimator: Interaction with user

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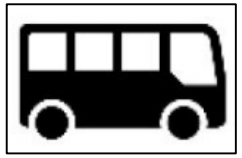
Step 1

Step 1: Selection of use case

URBAN TRANSPORT



PASSENGER CARS

FREIGHT TRANSPORT

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Step 2

Step 2: Definition of Initial Values

PARAMETERS

IMPACTS

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Step 3

Step 3: Definition of Base Scenario

- Scenario 1 – No Automation
- Scenario 2 – Pessimistic
- Scenario 3 – Neutral
- Scenario 4 – Optimistic
- Scenario 5 – Custom

Penetration rates of :
- Different levels of AVs
- Connected AVs
- Electric Vehicles, etc.

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Step 4

Step 4: Selection of Sub-use Case(s)

Sub-use Cases
Introduction of station to station AV shuttles
Introduction of anywhere to anywhere AV shuttles
Introduction of last-mile AV shuttles
Introduction of automated ride sharing
Introduction of a dynamic city toll for all empty vehicles
Introduction of a static city toll for non-automated vehicles
Introduction of a static city toll for all vehicles
Introduction of a dynamic city toll for non-automated vehicles
Introduction of a dynamic city toll for all vehicles
Replace long term parking space with space for public use
Replace long term parking space with driving lanes
Replace long term parking space with short term parking space
Automated urban freight delivery
Local freight consolidation

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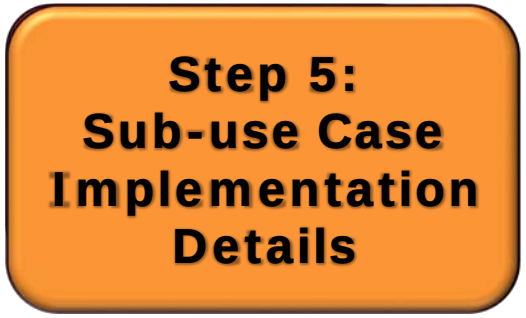
Step 5



- Selection of sub-use case(s) **implementation year**.
- Selection (for some sub-use cases) the "**amount**" of intervention, e.g. height of toll, etc.

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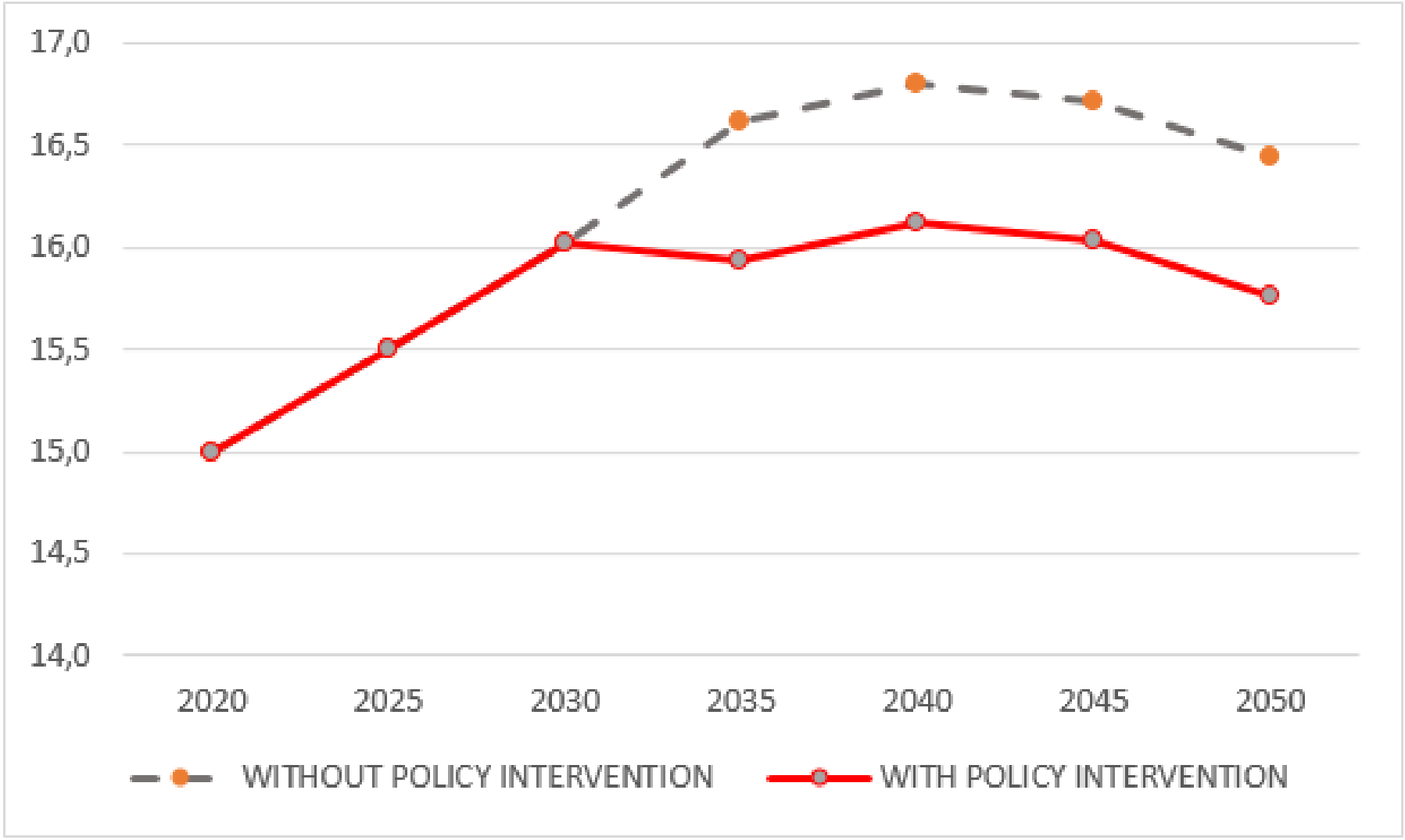
Results



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Forecasting estimator demo version

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PST Forecasting Estimator DEMO

Step 3: Definition of base scenario: SCENARIO 3 - NEUTRAL

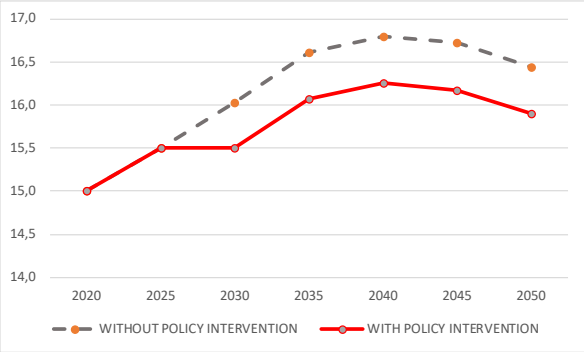
Step 4: Selection of policy intervention: Introduction of a static city toll for non-automated passenger cars

€ per entrance in city centre: 0,80 € (0€ - 10€)

Implementation year: 2025 (2020 - 2045)

RESULTS

Show graph for Impact no: 1



				WITHOUT POLICY INTERVENTION							WITH POLICY INTERVENTION						
no.	Impact	Description / measurement	Unit of Measurement	2020	2025	2030	2035	2040	2045	2050	2020	2025	2030	2035	2040	2045	2050
Direct impacts																	
1	Travel time	*Average duration of a 5Km trip inside the city centre*	*min*	*15,0*	*15,5*	*16,0*	*16,6*	*16,8*	*16,7*	*16,4*	*15,0*	*15,5*	*15,5*	*16,1*	*16,3*	*16,2*	*15,9*
2	Travel comfort	*Subjective rating of the level of comfort on a given trip (10 points Likert scale)*	*-*	*5*	*5*	*5*	*6*	*6*	*6*	*6*	*5*	*5*	*5*	*6*	*6*	*6*	*6*
3	Value of travel time	*Willingness to pay for reducing travel time by 5min per 10Km*	*€*	*1,00*	*1,07*	*1,15*	*1,12*	*1,15*	*1,27*	*1,32*	*1,00*	*1,07*	*1,16*	*1,13*	*1,17*	*1,30*	*1,35*
4	Vehicle operating cost	*Direct outlays for operating a vehicle per kilometre of travel*	*€/Km*	*0,250*	*0,251*	*0,253*	*0,258*	*0,260*	*0,283*	*0,286*	*0,250*	*0,251*	*0,248*	*0,253*	*0,255*	*0,278*	*0,282*
5	Access to travel	*The opportunity of taking a trip whenever and wherever wanted (10 points Likert scale)*	*-*	*5*	*5*	*5*	*5*	*6*	*6*	*7*	*5*	*5*	*5*	*5*	*6*	*6*	*7*
Systemic impacts																	
6	Amount of travel	*Person kilometres of travel per year in an area*	*Km*	*6.000*	*6.030*	*6.060*	*6.180*	*6.300*	*6.375*	*6.450*	*6.000*	*6.030*	*6.060*	*6.181*	*6.301*	*6.376*	*6.452*
7	Road capacity	*The average maximum number of vehicles that can pass a section of road per unit of time per lane*	*veh/hr.lane*	*1.500*	*1.504*	*1.508*	*1.523*	*1.556*	*1.594*	*1.641*	*1.500*	*1.504*	*1.508*	*1.523*	*1.556*	*1.595*	*1.641*
8	Congestion	*Average delays to traffic (per vehicle.trip) as a result of high traffic volume*	*min*	*10,0*	*10,3*	*10,7*	*11,1*	*11,2*	*11,1*	*11,0*	*10,0*	*10,3*	*10,2*	*10,5*	*10,7*	*10,6*	*10,4*
9	Modal split of travel 1	*% of trip distance made using public transportation*	*%*	*40,0%*	*40,4%*	*40,9%*	*41,0%*	*40,9%*	*40,9%*	*41,0%*	*40,0%*	*40,4%*	*41,8%*	*42,0%*	*41,9%*	*41,9%*	*42,0%*
10	Modal split of travel 2	*% of trip distance made using active transportation (walking, cycling)*	*%*	*3,0%*	*3,0%*	*3,0%*	*2,9%*	*2,8%*	*2,8%*	*2,7%*	*3,0%*	*3,0%*	*3,0%*	*2,9%*	*2,8%*	*2,8%*	*2,7%*
11	Vehicle ownership rate	*Average number of privately owned vehicles per household*	*veh*	*1,20*	*1,20*	*1,21*	*1,19*	*1,18*	*1,18*	*1,18*	*1,20*	*1,20*	*1,21*	*1,19*	*1,18*	*1,18*	*1,18*
12	Shared mobility rate	*% of trips made sharing a vehicle with others*	*%*	*4,0%*	*4,0%*	*4,3%*	*5,4%*	*8,3%*	*12,1%*	*15,4%*	*4,0%*	*4,0%*	*4,2%*	*5,4%*	*8,3%*	*12,1%*	*15,4%*
13	Vehicle utilisation rate 1	*% of time a vehicle is in motion (not parked)*	*%*	*8,0%*	*8,1%*	*8,6%*	*11,5%*	*18,6%*	*27,6%*	*35,8%*	*8,0%*	*8,1%*	*8,4%*	*11,3%*	*18,6%*	*27,6%*	*36,0%*
14	Vehicle utilisation rate 2	*average % of seats in use*	*%*	*35,0%*	*35,1%*	*35,2%*	*34,7%*	*32,7%*	*30,0%*	*26,4%*	*35,0%*	*35,1%*	*35,2%*	*34,7%*	*32,7%*	*30,0%*	*26,4%*
Wider impacts																	
15	Road safety	*Number of injury accidents in an area*	*accidents/year*	*2.000*	*2.018*	*1.984*	*1.999*	*1.708*	*1.336*	*1.020*	*2.000*	*2.018*	*1.988*	*2.004*	*1.713*	*1.340*	*1.024*
16	Air pollution	*Average concentration of NO2 pollutant per cubic metre of air*	*µg/m3*	*20,0*	*18,5*	*18,3*	*20,2*	*23,4*	*26,6*	*28,6*	*20,0*	*18,6*	*16,0*	*17,2*	*19,6*	*22,0*	*23,4*
17	Noise pollution	*%of individuals exposed to noise at disturbing level for more than 1h per day*	*%*	*5,0%*	*4,6%*	*4,6%*	*5,0%*	*5,9%*	*6,6%*	*7,1%*	*5,0%*	*4,6%*	*3,9%*	*4,4%*	*5,2%*	*6,0%*	*6,5%*
18	Commuting distances	*Average length of trips to and from work (added together)*	*Km*	*20,0*	*20,2*	*20,3*	*20,8*	*21,2*	*21,5*	*21,8*	*20,0*	*20,2*	*20,3*	*20,8*	*21,2*	*21,5*	*21,8*

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PST Forecasting Estimator DEMO

Step 3: Definition of base scenario: SCENARIO 2 - PESSIMISTIC

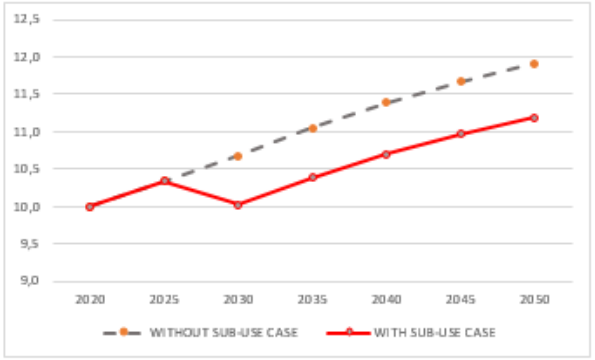
Step 4: Selection of sub-use case: Introduction of a static city toll for non-automated passenger cars

€ per entrance in city centre: 1,00 € (0€ - 10€)

Implementation year: 2025 (2020 - 2045)

RESULTS

Show graph for impact no: 8



no.	Impact	Description / measurement	Unit of Measurement	WITHOUT SUB-USE CASE							WITH SUB-USE CASE						
				2020	2025	2030	2035	2040	2045	2050	2020	2025	2030	2035	2040	2045	2050
Direct impacts																	
1	Travel time	*Average duration of a 5Km trip inside the city centre*	*min*	15,0	15,5	16,0	16,6	17,1	17,5	17,9	15,0	15,5	15,4	15,9	16,4	16,8	17,1
2	Travel comfort	*Subjective rating of the level of comfort on a given trip (10 points Likert scale)*	-	5	5	5	5	5	5	5	5	5	5	5	5	5	4
3	Value of travel time	*Willingness to pay for reducing travel time by 5min per 10Km*	€	1,00	1,09	1,19	1,27	1,35	1,50	1,59	1,00	1,09	1,20	1,29	1,37	1,52	1,72
4	Vehicle operating cost	*Direct outlays for operating a vehicle per kilometre of travel*	€/Km	0,250	0,255	0,261	0,267	0,274	0,300	0,311	0,250	0,255	0,255	0,261	0,268	0,294	0,305
5	Access to travel	*The opportunity of taking a trip whenever and wherever wanted (10 points Likert scale)*	-	5	5	5	5	6	6	6	5	5	5	5	6	6	6
Systemic impacts																	
6	Amount of travel	*Person kilometres of travel per year in an area*	Km	6.000	6.015	6.030	6.105	6.180	6.240	6.300	6.000	6.015	6.030	6.106	6.181	6.242	6.302
7	Road capacity	*The average maximum number of vehicles that can pass a section of road per unit of time per lane*	veh/hr.lane	1.500	1.502	1.504	1.513	1.526	1.542	1.560	1.500	1.502	1.504	1.513	1.527	1.542	1.560
8	Congestion	*Average delays to traffic (per vehicle trip) as a result of high traffic volume*	min	10,0	10,3	10,7	11,0	11,4	11,7	11,9	10,0	10,3	10,0	10,4	10,7	11,0	11,2
9	Modal split of travel 1	*% of trip distance made using public transportation*	%	40,0%	40,5%	40,9%	41,2%	41,4%	41,5%	41,7%	40,0%	40,5%	42,1%	42,4%	42,6%	42,7%	42,9%
10	Modal split of travel 2	*% of trip distance made using active transportation (walking, cycling)*	%	3,0%	3,0%	3,0%	3,0%	2,9%	2,9%	2,8%	3,0%	3,0%	3,0%	3,0%	2,9%	2,9%	2,8%
11	Vehicle ownership rate	*Average number of privately owned vehicles per household*	veh	1,20	1,21	1,21	1,21	1,21	1,21	1,21	1,20	1,21	1,21	1,21	1,21	1,21	1,21
12	Shared mobility rate	*% of trips made sharing a vehicle with others*	%	4,0%	4,2%	4,4%	5,3%	7,2%	10,1%	12,7%	4,0%	4,2%	4,3%	5,2%	7,1%	10,1%	12,8%
13	Vehicle utilisation rate 1	*% of time a vehicle is in motion (not parked)*	%	8,0%	8,3%	8,9%	10,9%	15,5%	22,4%	28,9%	8,0%	8,3%	8,7%	10,7%	15,4%	22,4%	29,0%
14	Vehicle utilisation rate 2	*average % of seats in use*	%	35,0%	35,1%	35,2%	35,0%	33,8%	32,0%	29,4%	35,0%	35,1%	35,2%	35,0%	33,8%	31,9%	29,4%
Wider impacts																	
15	Road safety	*Number of injury accidents in an area*	accidents/year	2.000	1.978	1.927	1.916	1.712	1.440	1.188	2.000	1.978	1.931	1.921	1.719	1.448	1.197
16	Air pollution	*Average concentration of NO2 pollutant per cubic metre of air*	µg/m3	20,0	18,9	19,0	20,3	23,2	26,9	30,1	20,0	19,0	16,2	17,2	19,5	22,6	25,4
17	Noise pollution	*%of individuals exposed to noise at disturbing level for more than 1h per day*	%	5,0%	4,7%	4,8%	5,1%	5,8%	6,7%	7,5%	5,0%	4,7%	3,9%	4,2%	4,9%	5,9%	6,7%
18	Commuting distances	*Average length of trips to and from work (added together)*	Km	20,0	20,1	20,2	20,5	20,8	21,1	21,3	20,0	20,1	20,2	20,5	20,8	21,1	21,3

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PST Forecasting Estimator DEMO

Step 3: Definition of base scenario: SCENARIO 4 - OPTIMISTIC

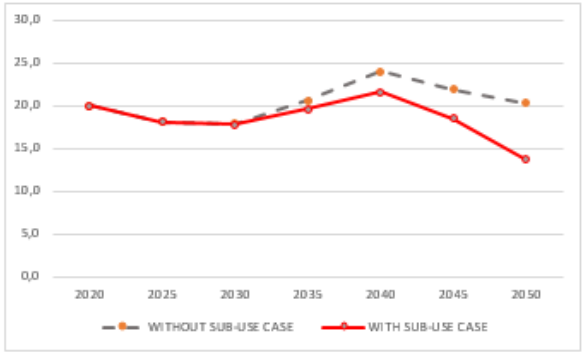
Step 4: Selection of sub-use case: Introduction of a static city toll for non-automated passenger cars

€ per entrance in city centre: 1,00 € (0€ - 10€)

Implementation year: 2045 (2020 - 2045)

RESULTS

Show graph for Impact no: 16



no.	Impact	Description / measurement	Unit of Measurement	WITHOUT SUB-USE CASE							WITH SUB-USE CASE						
				2020	2025	2030	2035	2040	2045	2050	2020	2025	2030	2035	2040	2045	2050
Direct impacts																	
1	Travel time	Average duration of a 5Km trip inside the city centre	min	15,0	15,5	16,0	16,7	16,3	14,5	13,1	15,0	15,5	16,0	16,7	16,3	14,5	12,5
2	Travel comfort	Subjective rating of the level of comfort on a given trip (10 points Likert scale)	-	5	6	6	7	8	7	7	5	6	6	7	8	7	7
3	Value of travel time	Willingness to pay for reducing travel time by 5min per 10Km	€	1,00	0,95	1,01	0,97	0,86	0,99	0,99	1,00	0,95	1,01	0,97	0,86	0,99	1,03
4	Vehicle operating cost	Direct outlays for operating a vehicle per kilometre of travel	€/Km	0,250	0,246	0,245	0,252	0,251	0,254	0,246	0,250	0,246	0,245	0,252	0,251	0,254	0,241
5	Access to travel	The opportunity of taking a trip whenever and wherever wanted (10 points Likert scale)	-	5	5	5	5	6	7	8	5	5	5	5	6	7	8
Systemic impacts																	
6	Amount of travel	Person kilometres of travel per year in an area	Km	6.000	6.060	6.120	6.285	6.450	6.525	6.600	6.000	6.060	6.120	6.285	6.450	6.525	6.600
7	Road capacity	The average maximum number of vehicles that can pass a section of road per unit of time per lane	veh/hr.lane	1.500	1.508	1.515	1.536	1.598	1.705	1.800	1.500	1.508	1.515	1.536	1.598	1.705	1.800
8	Congestion	Average delays to traffic (per vehicle trip) as a result of high traffic volume	min	10,0	10,3	10,7	11,1	10,9	9,7	8,7	10,0	10,3	10,7	11,1	10,9	9,7	8,2
9	Modal split of travel 1	% of trip distance made using public transportation	%	40,0%	40,4%	40,7%	40,7%	40,4%	40,3%	40,3%	40,0%	40,4%	40,7%	40,7%	40,4%	40,3%	41,5%
10	Modal split of travel 2	% of trip distance made using active transportation (walking, cycling)	%	3,0%	3,0%	3,0%	2,9%	2,7%	2,7%	2,6%	3,0%	3,0%	3,0%	2,9%	2,7%	2,7%	2,6%
11	Vehicle ownership rate	Average number of privately owned vehicles per household	veh	1,20	1,20	1,20	1,17	1,15	1,15	1,15	1,20	1,20	1,20	1,17	1,15	1,15	1,15
12	Shared mobility rate	% of trips made sharing a vehicle with others	%	4,0%	3,9%	4,1%	6,0%	10,0%	13,9%	17,5%	4,0%	3,9%	4,1%	6,0%	10,0%	13,9%	17,6%
13	Vehicle utilisation rate 1	% of time a vehicle is in motion (not parked)	%	8,0%	7,7%	8,5%	12,9%	23,1%	32,8%	41,7%	8,0%	7,7%	8,5%	12,9%	23,1%	32,8%	42,0%
14	Vehicle utilisation rate 2	average % of seats in use	%	35,0%	35,1%	35,2%	34,4%	31,4%	27,8%	23,3%	35,0%	35,1%	35,2%	34,4%	31,4%	27,8%	23,3%
Wider impacts																	
15	Road safety	Number of injury accidents in an area	accidents/year	2.000	2.098	2.098	2.115	1.704	1.237	878	2.000	2.098	2.098	2.115	1.704	1.237	873
16	Air pollution	Average concentration of NO2 pollutant per cubic metre of air	µg/m3	20,0	18,1	17,9	20,6	24,0	21,9	20,2	20,0	18,1	17,7	19,6	21,5	18,5	13,6
17	Noise pollution	%of individuals exposed to noise at disturbing level for more than 1h per day	%	5,0%	4,5%	4,5%	5,1%	6,0%	5,5%	5,1%	5,0%	4,5%	4,5%	5,1%	6,0%	5,5%	4,4%
18	Commuting distances	Average length of trips to and from work (added together)	Km	20,0	20,3	20,5	21,1	21,7	22,0	22,3	20,0	20,3	20,5	21,1	21,7	22,0	22,3

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George Yannis
Anastasios Dragomanovits

Policy Support Tool

Next Steps

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

Next steps

- **Simulations** running in order to define relationships for three sub-use cases **15 January 2020**
- First **operating demo** for the three sub-use cases due to the Manchester Plenary meeting **5 February 2020**
- Start developing the **web PST** after validation of the demo **February 2020**
- Further interaction with the end users fr the optimization of the web PST
- **Training** workshops on the use of the web PST

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For more information:

www.levitate-project.eu

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