

## Objectives of the measure

- **At measure level:**
  - Improve geographic coverage of PT to reduce private car trips.
  - Reduce travel times with PT.
  - Boost night-time PT demand (mainly bus).
  - Understand mobility patterns of private vehicles and adapt PT offer (schedules, routes, PT stops) accordingly.
- **Contributing to city level objectives of:**
  - Reduce trips made by private vehicles

## Description of the measure

- **Situation before:**

The pandemic years have resulted in a profound change in mobility patterns amongst the citizens. PT demand has practically recovered to pre-pandemic levels, although this has not been the case for night-time demand. This situation raises the need to initiate actions to **better comprehend these new patterns in order to optimise the PT operation accordingly** and satisfy the changing user needs.

- **General description:**

This measure will use the geospatial analysis of passenger and travellers flow to define the optimal transport offer according to specific city situations. This measure will develop advanced data analytics and a big data visualization tool to evaluate public transport passengers' flows, analyse potential underlying trends in mobility and transport modes, detect inefficiencies in the current offer and elaborate future recommendations (increase frequency of some bus lines, add/move new bus stops...). With the support of U-NEED, the OD matrix and mobility patterns of PT users and private vehicle users will be analysed and compared, with the final goal of detecting areas not well covered and identify the most relevant inefficiencies in the PT offer (in terms of travel times, multimodality, door-to-door mobility...). Moreover, with the support of U-SIM.plan, potential corrective actions will be simulated to support the decision-making process.

- **Measure outputs:**

This measure will deliver:

- Modelling of citizens' mobility patterns in Valencia, including the representation of PT OD matrices.
- Report on the main inefficiencies of the PT offer and recommendations for adapting it to the real demand.
- Simulation of some corrective actions and a roadmap on the PT adaptations to be implemented in the city.
- Implementation of corrective strategies

- **Supporting activities:**

Specific user groups (or VRUs) can be engaged through U-GOV in order to ensure that the adapted PT offer covers the needs of every target group. The feedback collected from these groups can enrich the information extracted from data analytics.

- **Interaction with other city measures: UPPER and non-UPPER measures**

This measure is related to other measures in Valencia to improve bus operations:

- **VAL\_01:** Redistribution of urban space, including creating bus corridors
- **VAL\_04:** Implementing bus corridors and improving traffic management

## Target groups and/or geographical impact areas

- **Target groups:** PT users and potential PT users (mainly those using the private car).
- **Geographic impact area:** The whole city, including the peri-urban areas that can (or that could be) reached by means of PT.

## Stakeholders

The following stakeholders will be required for the implementation of this measure.

- **ETRA and PTV:** Technology providers (U-NEED & U-SIM.plan)
- **EMT:** PTO for bus fleet and decision maker in terms of bus operation. Main end user in the scope of the project.
- **Private vehicle data providers** (TOMTOM, car-sharing fleet operators,...): Provide OD matrix of private vehicles.
- **Municipality:** Decision maker in terms of infrastructure work and space reallocation (e.g. build a new P&R).
- **Other transport operators:** FGV, Valenbisi, MetroValencia,...All these transport operators can also provide data for mapping the citizens mobility patterns. They can also receive a report on the inefficiencies and potential corrective actions to improve the offer of their transport modes.

## U-tools support

The implementation of this measure will be actively supported by four IT tools from the UPPER toolkit:

- **U-NEED:** This tool will allow the city to have a deep understanding on the mobility patterns of the citizens and identify the main inefficiencies in the PT offer. The U-tool will provide suggestions on potential solutions (change the bus route or schedule, introduce new lanes, increase the capacity of the buses, introduce a P&R,...)
- **U.SIM (and more specifically, U-SIM.plan):** The potential solutions suggested by U-NEED will be then simulated by U-SIM.plan, thus allowing the decision maker (EMT, Municipality,...depending on the solution) to make the best choice to adapt the offer to the real demand.
- **U-SUMP:** Support data analytics and big data visualization to analyse potential trends based on the selected KPIs. Support the decision-making process.
- **U-GOV:** Can be used to identify user needs (specially of certain user groups) and complement the information extracted from the OD matrixes.

## Link to other UPPER measures

This measure is similar to UPPER measures implemented in other cities, especially:

- **IDF\_06:** Advanced technology to optimise the PT offer in line with users' needs and patterns.
- **OSL\_03:** Develop a roadmap for new mobility alternatives & operating models to reduce private car ownership.
- **MAN\_03:** Data-driven platform for supporting PT planning and operations based on the concept of MaaR.
- **BUD\_01:** To improve the efficiency and convenience of PT service.

## Process of implementation of the measure

Stages	Description	Intermediate milestones
<b>Design</b>	Data collection, geospatial analysis of passenger flows and identification of inefficiencies	<ul style="list-style-type: none"> <li>- Data collection of private vehicles and PT</li> <li>- OD matrix generation</li> <li>- Data analytics</li> <li>- Identification of inefficiencies in PT offer</li> </ul>
<b>Preparation</b>	Selection of strategies for improving PT offer	<ul style="list-style-type: none"> <li>- Identification of corrective strategies</li> <li>- Simulation of corrective strategies and selection of the most suitable ones</li> </ul>
<b>Implementation</b>	Implementations of corrective strategies	<ul style="list-style-type: none"> <li>- Implementation of corrective strategies</li> <li>- Monitoring of corrective strategies</li> </ul>

## Sub-measures and preliminary indicators

Measure	Sub-measure (If applicable)	Impact indicators
VAL_03	n/a	<ul style="list-style-type: none"> <li>- Reduced number of car trips.</li> <li>- Travel time savings after and before the implementations of corrective strategies.</li> <li>- PT regularity and punctuality after and before the implementations of corrective strategies.</li> <li>- Total amount of the night-time bus ridership before and after the implementation of corrective strategies.</li> <li>- Access to mobility services indicator.</li> </ul>