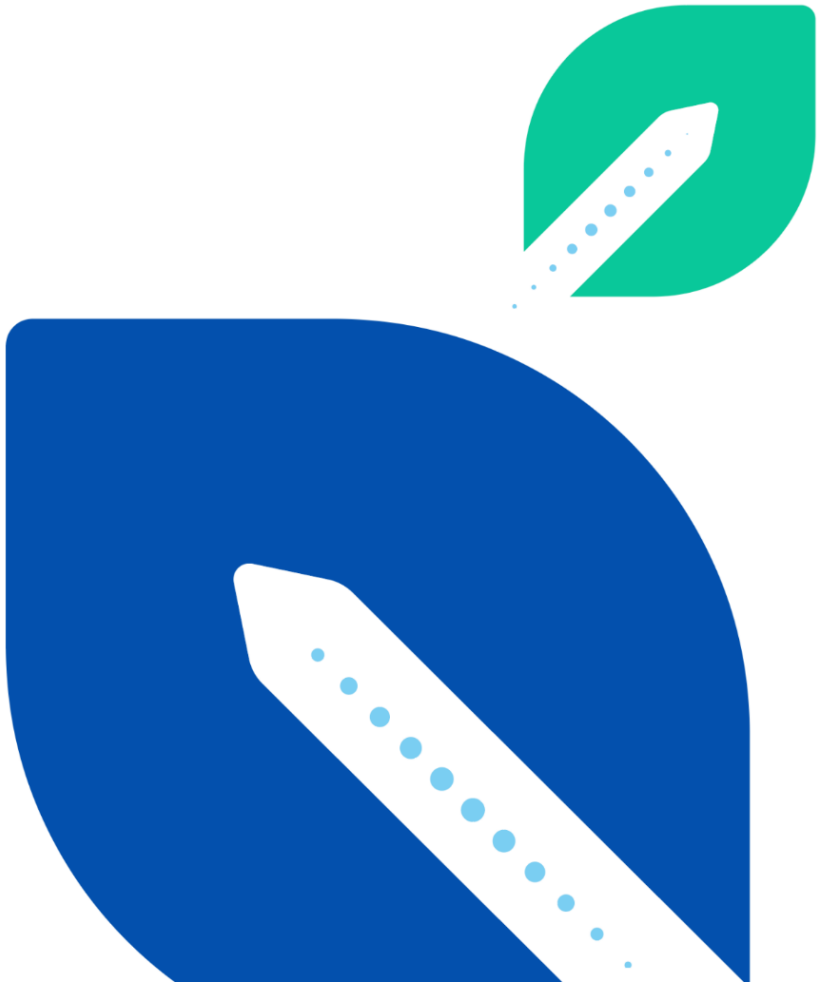
D4.3 Impact assessment and city-specific policy response

Valencia pilot



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Executive summary

The pilot of the city of Valencia aims at develop an *"Intermodal urban passenger/freight node for collective public & private transport"*. This intermodal node has the following objectives:

1) Allowing passengers to connect to several sustainable urban transport modes in an easier way, avoiding the use of private car and fostering the use of more environmentally friendly transport solutions. In particular, the mobility solution tested aimed at fostering the use of environmentally friendly alternatives to reach metro stations (bike or foot) at the same time of expanding the scope of attraction of metro stations such as bicycles, train and buses
2) Reducing the number of last-mile deliveries within the city.

To this end, the pilot implemented two use cases as follows:

- Case 1: integration between bikes and public transport means into an intermodal node by the installation of secure bike parking at metro stations.
- Case 2: integration between passenger and last-mile freight transport through the co-location of new advanced services (e-lockers) into an intermodal node (metro station).

With these objectives in view, two solutions were designed and implemented.

The first solution consists of a private bicycle parking system that was initially installed in two metro stations in the metropolitan area of Valencia. This solution aims to facilitate bicycle access for metro passengers, thus eliminating private vehicles from the roads, reducing CO2 emissions and increasing the intermodality share of metro passengers. The design of the secure bicycle parking was carried out by Ferrocarrils de la Generalitat Valencia (FGV) with the support of the Fundacion Valenciaport. The main design criteria were to guarantee security (avoiding theft and damage to private bicycles) and aesthetic criteria, as it would form part of the urban furniture of the city in which it was to be implemented and harmony with the urban landscape had to be guaranteed. In addition, a technological development was carried out to allow metro users to register their transport pass cards and with these same cards open the door to park their bikes. This area has also been equipped with surveillance cameras. On the other hand, to monitor the operational parameters, a system based on Power BI was designed to analyse the usage indicators. This solution, within the scope of SPROUT, was initially tested in two stations selected on the basis of two criteria: 1) user opinion (surveys were carried out) and 2) technical feasibility criteria (availability of space, if the space was public land managed by another public body, their willingness to collaborate, connection to bike lanes and accessibility to power and internet sockets to be able to carry out the installations). Based on these criteria, two stations were selected: Empalme and Torrent-Avinguda. However, given the strategic interest for the Valencia Mobility regional government, this solution was implemented in two other locations in Valencia (Quart and Alboraya) as well as in one in the province of Alicante (Benidorm).

After the pilot test of this case study, the following main results were obtained:

- Average daily usage 4 users (compared to 16 available places).
- The metro+bike intermodality ratio increased by 6%.

- CO_2 emissions were reduced by 0.7% and it is estimated that when the solution penetrates the market and matures, an average of 12 daily users can be reached and emissions are reduced by 2.8%

The second use case is the installation of elockers in some metro stations. In order to benefit from the affluence of passengers so that they can send their parcels to pick-up points instead of sending them to their homes. In this way, as far as last mile distribution is concerned, delivery trips will be avoided, as a large number of parcels can be delivered with just one stop at the installed lockers. For the pilot of this use case, a delivery service operator, Correos, which already had experience in deploying this type of solution, was involved. In the case of Valencia, there was already an e-locker service in some private locations such as fuel stations, supermarkets or residential buildings, but not in public spaces. However, in other Spanish cities, Correos has e-lockers in railway interchanges, which are very successful. For this second use case, a study was carried out to analyse the optimal location, taking into account on the one hand the preferences of potential users (through a questionnaire) and on the other hand the technical criteria for its installation (electricity supply, wifi coverage and being located within the range of the security cameras installed in the metro station).

The stations selected for the pilot test were the two stations with the highest passenger volume: Colon and Xàtiva, both in the centre of Valencia.

During the pilot test, 261 parcels were sent to the two installed e-lockers, saving 165 kg of CO_2 emissions and with an annual potential to save around 4 tonnes of CO_2 per year.

Following the analysis of both use cases, the following recommendations can be highlighted:

1) Need for cooperation between different public bodies: in the case of bicycle parking, although it is a service offered by the public authority responsible for the operation of the passenger metro service, public spaces managed by different municipalities, which have granted them the occupation of such land, have been used. In addition, there are barriers in the safe connection to cycle paths, which is the responsibility of the municipalities, so there is a clear need for cooperation in the implementation of sustainable mobility measures.
2) Incentives for the use of sustainable mobility solutions: in the case of bicycle parking, the cost of the infrastructure as well as the costs derived from its maintenance are fully covered by FGV, as it would be an unfeasible solution if users had to pay for the service.
3) Awareness and dissemination campaigns among citizens are vital to convince them to use these new models and to make them known

This report aims to explain the work and results of testing and assessing the pilot's mobility solutions, identify a list of alternative policy responses according to the stakeholders' objectives and users' needs, and define the final city-specific policy response.

Table of Contents

1 Introduction

1.1 Aim of the deliverable

The deliverable aims to explain the work and results of testing and assessing the pilot's mobility solutions, identify a list of alternative policy responses according to the stakeholders' objectives and users' needs, and define the final city-specific policy response. The work consists of three steps. The first step was the implementation and assessment of the mobility solution. The barriers and problems found together with the sustainability assessment were the basis for the sequential steps and the definition of the city-led policy. By the time the second step started, the city of Budapest was able to find only one problem for one of the use cases. Based on the Stakeholders Based Impact Scoring (SIS) methodology, the pilot identified the veto stakeholders, found their objects and showed the trade-offs all stakeholders have to make. In the last step, Budapest identified a list of alternative policy responses to enhance the mobility solution adoption, scalability and transferability. Finally, the pilot assessed the alternative policy responses implementation and user acceptance and defined the policy measures that harness the implementation of Budapest innovative mobility solutions.

1.2 How this deliverable relates to other deliverables

The development of the task considered previous SPROUT work. More specifically, the pilot followed de steps and methods reported in D4.3. COVID-19 disruptions and other challenges encountered during the pilot implementation forced to adjust the initial set-up as explained in this document. The list of alternative policies identified in D3.3 was essential for identifying alternative policy responses and defining the city-specific policy response. This deliverable and the rest of the pilots' reports (D4.5, D4.7, D4.9 and D4.11) will be the foundation for defining the policy implementation messages in D4.14 and the urban policy system dynamics model in D5.2.

1.3 Task Participants and sharing of contribution

The participants for this deliverable are the pilot leader, Fundación Valenciaport (FVP), and ZLC as WP4 leader. ZLC supported the pilot during the whole process for developing the deliverable. The Valencia pilot leader counted with the pilot partners which are the Valencian Region's Railway Company (*Ferrocarrils de la Generalitat Valenciana)* and Valencia City Council (*Ajuntament de València*). Others Valencian stakeholders have participated at the workshops and MAMCA evaluation.

1.4 Structure of the deliverable

- The deliverable is structured as follows:
- Chapter 2: Pilot activity description
- Chapter 3: T4.3 Sustainability assessment
- Chapter 4: T4.4 Formulation and prioritization of alternative policy responses
- Chapter 5: T4.5 City-specific policies for harnessing the impact of new mobility solutions
- Chapter 6: Summary and Outlook
- References
- Annexes

2 Pilot activity description

2.1 Introduction

The pilot tested in Valencia consists of the deployment of an "*Intermodal urban passenger/freight node for collective public & private transport*" that includes two use cases:

- Case 1: integration between bikes and public transport means into an intermodal node by the installation of secure bike parking at metro stations.
- Case 2: integration between passenger and last-mile freight transport through the co-location of new advanced services (e-lockers) into an intermodal node (metro station).

The aim of both pilot cases is enhancing the city's mobility, as it helps to reduce traffic congestion, and to reduce the GHG emissions.

This intermodal urban node in FGV stations aims to:

1. Improve in the quality of the service provided by Metrovalencia (Use cases 1 and 2).
2. Improve intermodality in metro stations, complementing the use of public transport with the use of sustainable private transport modes (bicycle) (Use case 1).
3. To increase the station's radius of attraction, especially in low-density residential areas or in urban stations with population (urban or dispersed) located more than 1 km from the station (Use case 1).
4. Promote the use of station as picking points of parcels reducing the number of last-mile vehicles in the city (Use case 2).

Figure 1: Intermodal urban passenger/freight node concept (Source: *SPROUT D4.2 Set-up Report Valencia,* Fundación Valenciaport)

2.2 Description

2.2.1 Concept

As been explained in '*D.4.2: Set-up report Valencia'* the pilot for the city of Valencia deploys an "*Intermodal urban passenger/freight node for collective public & private transport*" that firstly allows passengers to connect to several sustainable urban transport modes in an easier way, avoiding the use of private car and fostering the use of more environmentally friendly transport solutions such as bicycles, train and buses, and additionally it aims to reduce the number of last-mile deliveries within the city. The objectives linked to the pilot are 15% increasing intermodality (I410) and 2% GHG reduction emissions (I404).

To achieve these objectives, the pilot has consisted of two cases:

- Case 1: integration between bikes and public transport means into an intermodal node by the installation of secure bike parking at metro stations.
- Case 2: integration between passenger and last-mile freight transport through the co-location of new advanced services (e-lockers) into an intermodal node (metro station).

Both pilot cases will enhance the city's mobility, as it will help to reduce traffic congestion, and reduce the GHG emissions.

- **Use Case 1: Integration between bikes and public transport means into an intermodal node**

As been explained in '*D.4.2: Set-up report Valencia'*, the first Use Case in Valencia consists of installing two private bike packings at metro stations in the metropolitan area of Valencia, acknowledge as "Cicloparc". The aim is to promote the use of public and bike transport to non-users who would be willing to shift the car with the combination of their bikes and metro. Potential future users are commuters who live at a medium distance but larger enough to avoid reaching the metro by walking. The installation of the Cicloparc gives the opportunity to reach the metro station by bike and keep it in a safe place and avoid illegal parking such as against street furniture, lampposts or benches.

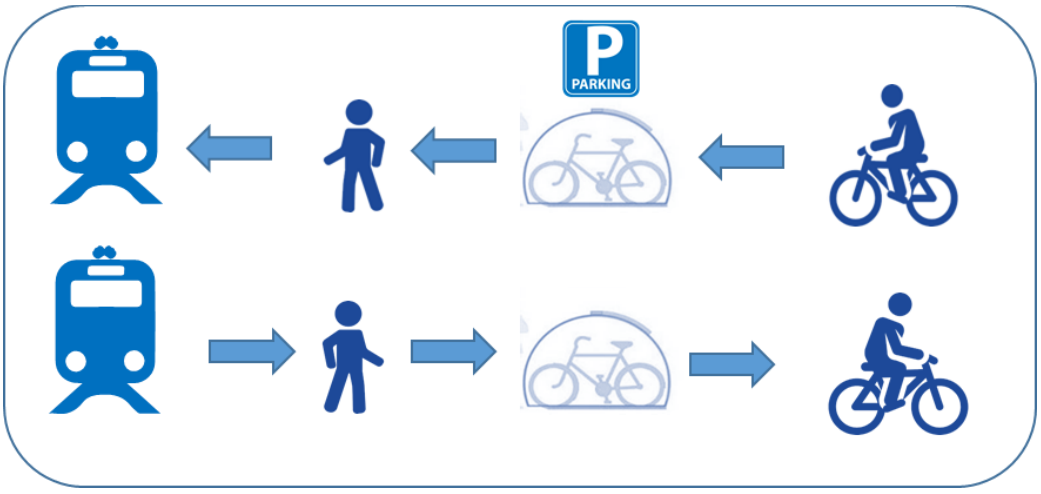


Figure 2: Use case 1: Intelligent parking system for intermodal nodes (Source: *SPROUT D4.2 Set-up Report Valencia,* Fundación Valenciaport)

- **Use Case 2: smart lockers into intermodal nodes**

This second use case consists of installing two e-lockers at the hall of crowed metro stations in the city of Valencia. The aim is to promote the use of station as picking and delivery points of parcels reducing the number of last-mile trips in the city.

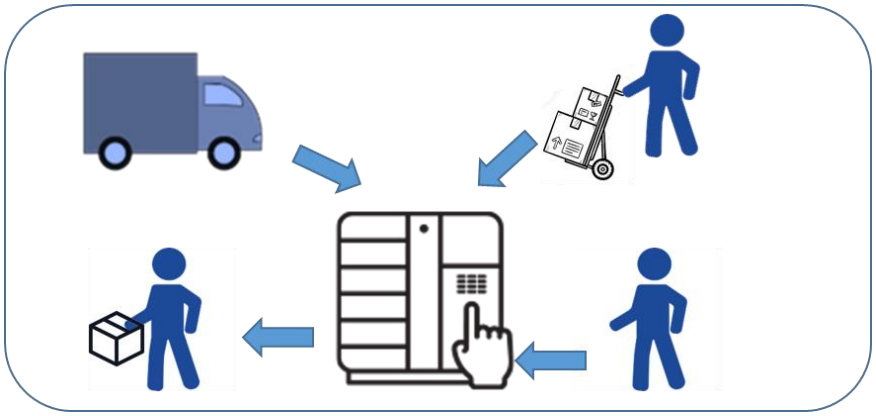


Figure 3: Use case 2: E-lockers system for intermodal nodes (Source: SPROUT D4.2 Set-up Report Valencia)

2.2.2 Location

The selection of metro stations was the first step of both Use Cases. In order to select the most suitable metro stations for the pilot implementation, several analyses were performed:

1. **Passenger flow**: the passenger annual flows were studied in order to select the most crowded nodes in the metropolitan area of Valencia for the Cicloparcs and at the city of Valencia for e-lockers.
2. **Field-study:** In order to analyse the station that meet the requirement for the pilot implementation, a field visit was performed in order to assess the following aspects:
   - Availability of space to locate the bike parking and the e-lockers.
   - Security of the station: to analyse whether the available spaces are within the reach of existing surveillance systems.
3. **On-line questionnaires:** in order to consider the opinion of the potential users about the location of the new facilities.

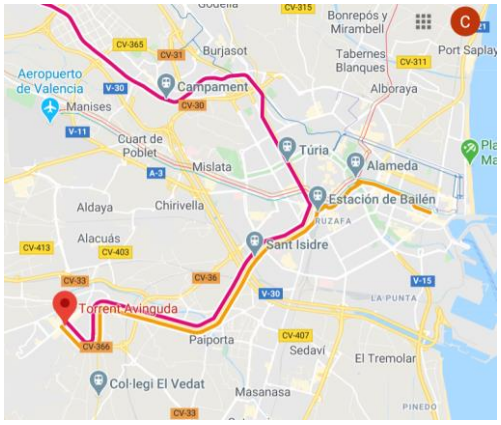
Finally, the three key factors in the decision-making process were:

a) space available to install the parking facilities in the immediate vicinity of the subway entrance (Use Case 1) and to install the e-lockers in the inner hall of the metro stations (Use Case 2).
b) the users' preferences expressed in the questionnaires.
c) and the security provision (FGV camera surveillance).

The full explanation of the selection process can be found in Annex 1 of this document.

BIKE PARKING PILOT

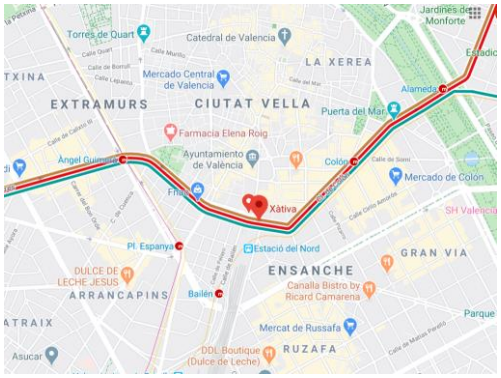
LOCATION 1: TORRENT AVINGUDA METRO STATION



LOCATION 2: EMPALME METRO STATION

E- LOCKERS PILOT

LOCATION 1: XÀTIVA STATION



LOCATION 2: COLON

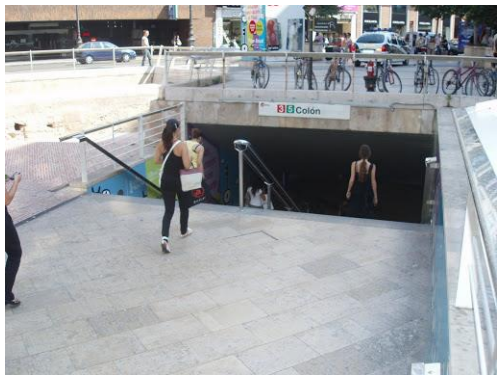


Figure 4: Location for the Use Cases of Valencia

Because the project is very much aligned with regional and municipal public policies on sustainable mobility, Ferrocarrils de la Generalitat Valenciana (FGV) has expanded the offer of Cicloparcs to other two metro stations at metropolitan area of Valencia are Alboraya-Palmaret and Quart.

The following figure shows the map of the metro network of Valencia with the locations of the five existing Cicloparcs and the two e-lockers:

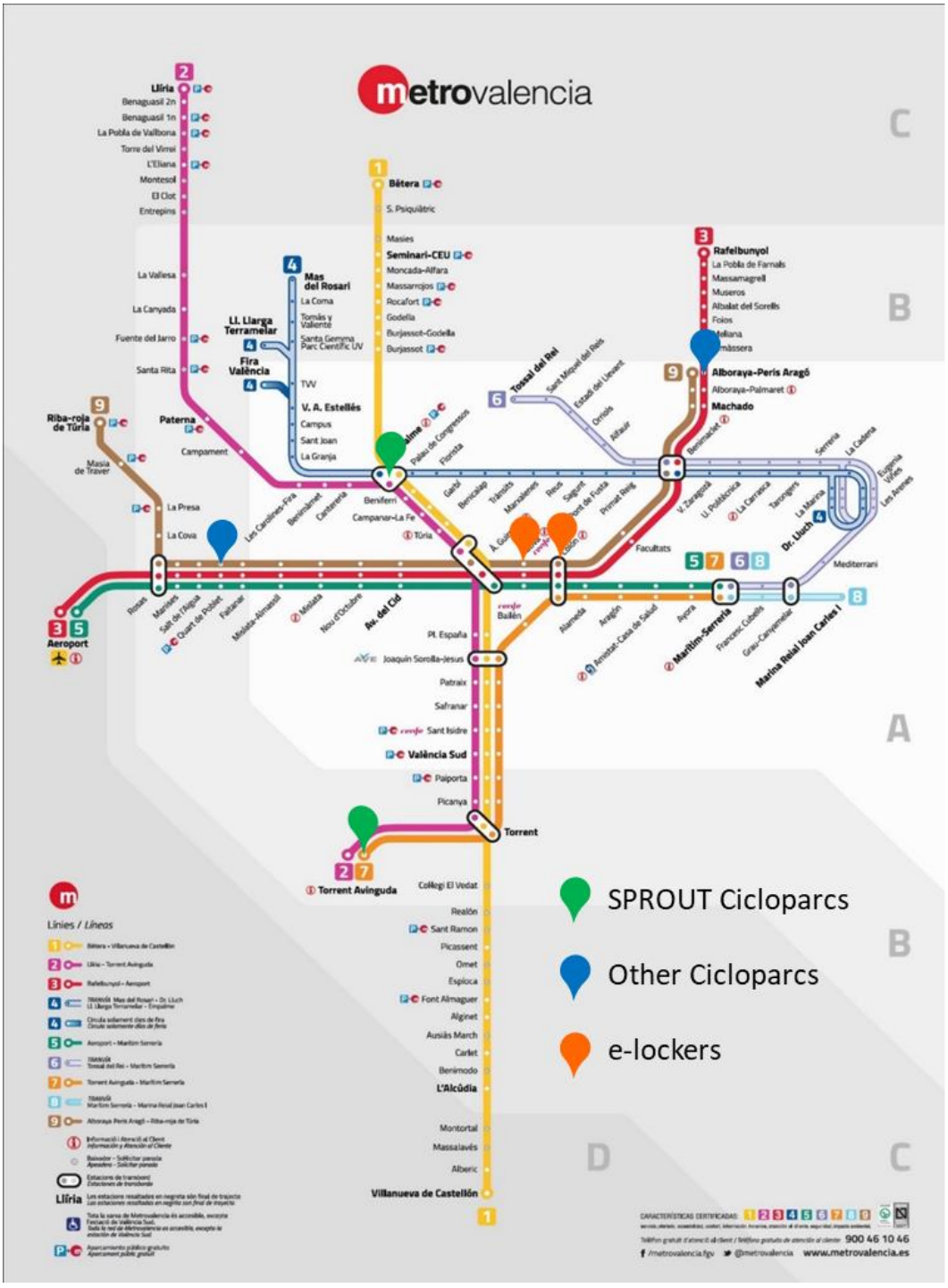


Figure 5: *MetroValencia* network and location of Cicloparcs and e-lockers

On the other hand, as FGV manages both the transport services of Metrovalencia and the TRAM of Alacant, for policies of regional balance and equity, the third location selected for an extra Cicloparc was at the tram line of Alacant, and Benidorm station was chosen with the same criteria as those used before: space available, passengers' preferences, security and number of passengers.

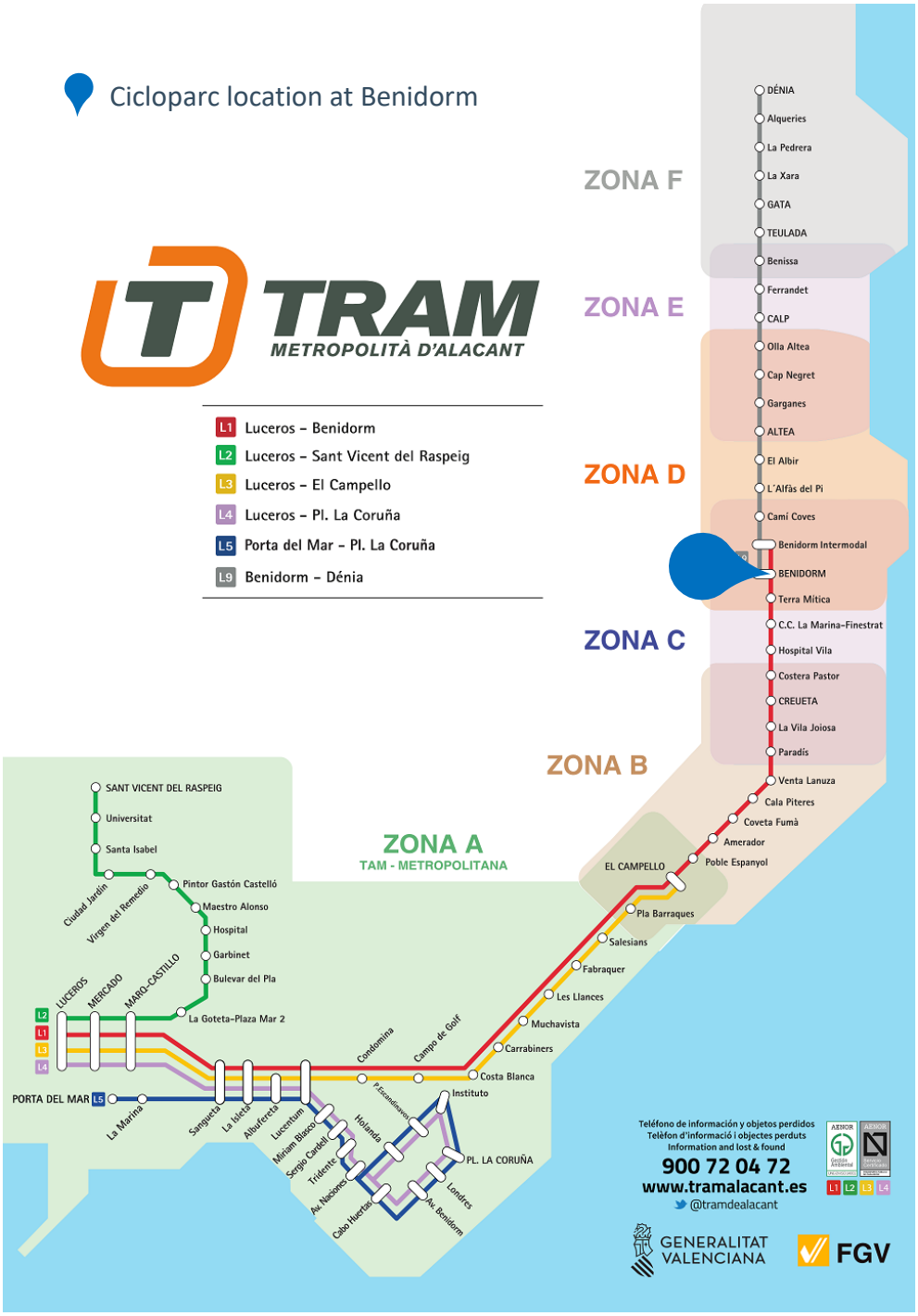


Figure 6: Location for the Use Case 1 at the tram of Alacant

2.2.3 Facilities

Cicloparc infrastructure

For the Use Case 1 the design of the facility was carried out by an FGV supplier according to the design requirements specified by FGV. In addition, FGV selected a commercial name for this solution, Cicloparc. Each one has space for 16 bicycles. The design of the facility is shown in the following image:

Figure 7: Use Case 1. Design of the bikes parking, named Cicloparc (Source: *SPROUT D4.2 Set-up Report Valencia*, Fundación Valenciaport)

Citypaq facilities

Correos has developed modular smart lockers that adapt to the available space and expected demand. They need electric connection although they have low electricity consumption, and they also need data connection.

Figure 8: Use Case 2. Design of the selected Citypaq for the Xativa metro station (Source: *SPROUT D4.2 Set-up Report Valencia*, Fundación Valenciaport)

2.2.4 Operation

Cicloparc service operation

From the operational point of view, all metro users can activate the option of using the bicycle parking system on their Metrovalencia card.

Figure 9: FGV card

Previously, they need to register themselves on the Metrovalencia website (www.metrovalencia.es) in the bicycle parking system (this functionality will be integrated with the Metrovalencia toll system and uses NFC MIFARE technology[1]).

After activating the card and once in the Cicloparc, bike owners can use their card to open the gate with the reader that is installed in the entrance of the parking facility.

[1] Info about this technology on: https://www.mifare.net/es/

Figure 10: Use Case 1. Cicloparc entrance and card reader at Torrent Avinguda station

When the card is swiped through the door reader, it remains registered in the Metrovalencia system. When the user swipes their card through the reader, both the user number and the opening time remain registered in the Metrovalencia database. On their way back, users can pick up their bicycle using the same process, swiping their Metro card in the reader at the entrance and unlocking the bicycle by opening their own padlock.

During the pilot, the operation of the project's Cicloparcs (Torrent Avinguda and Empalme) were to be free of charge. The other three additional ones also started free of charge and still operate without any cost for the users.

E-lockers operations

The parcel delivery service through intelligent lockers will work as follows:

1. Any user (metro or not) can register to receive their packages through the service operator's website: www.citypaq.es
2. When you register you can choose the locker where you want to receive your purchases
3. In your online purchases in stores associated with this system, you can indicate your selected locker as the destination.
4. When the package is available in the locker, the user will receive a code by SMS/mail/app to open the locker.
5. The user will be able to pick up the package using the barcode receipt to open the locker.

Figure 11: Use Case 2. Use of Citypaq for picking and delivering

2.3 Business Model

In a workshop with the stakeholders of each pilot case, a business model was developed using the Canvas tool. Annex 2 explains what the Business Model Canvas tool consists of and how to build it.

Figure 12 represents the Business Model Canvas for Cicloparcs and Figure 13 represents the Business Model Canvas for Citypaqs.

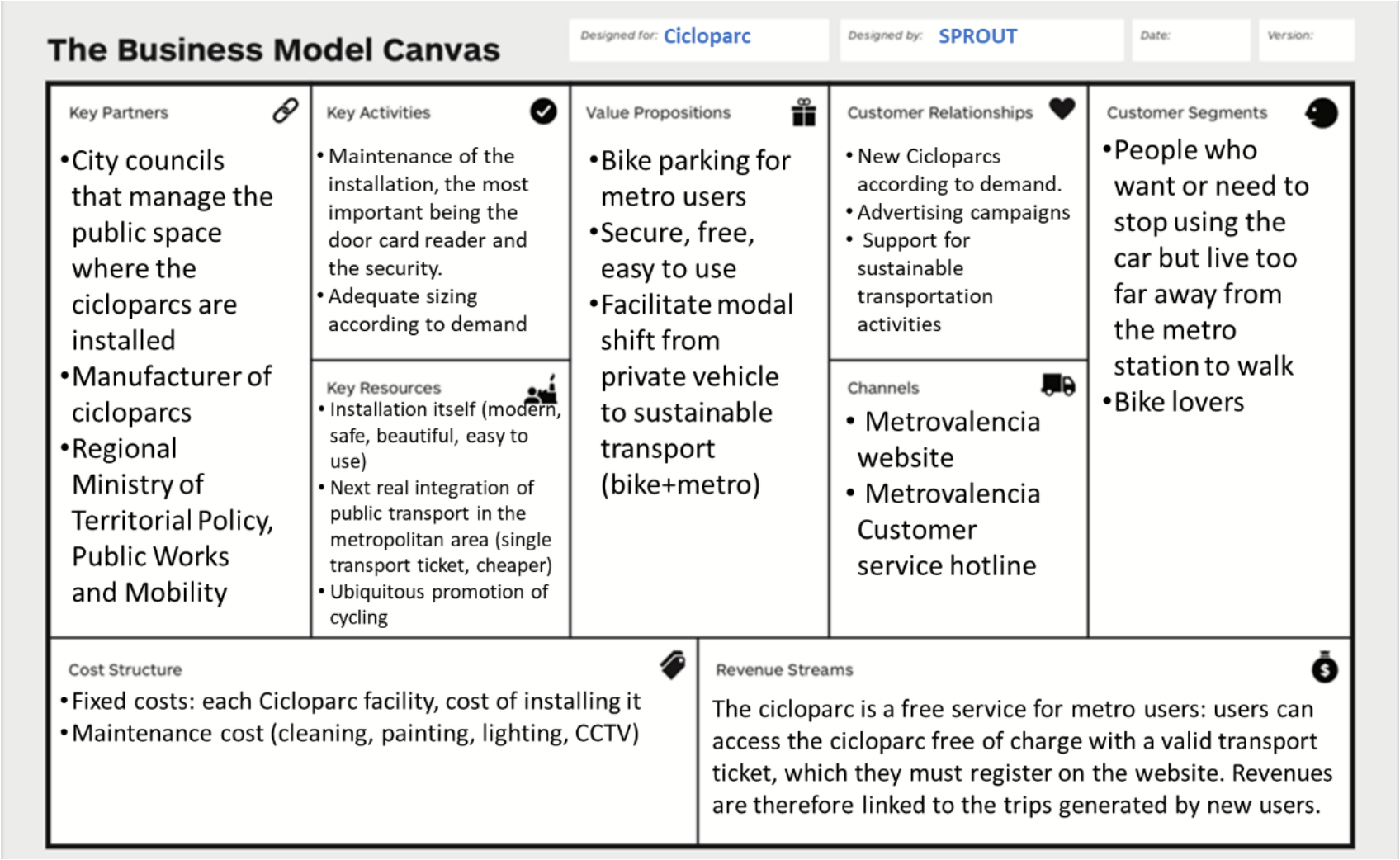


Figure 12: Canvas Business Model for Use Case 1 – Cicloparcs

Figure 13: Canvas Business Model for Use Case 2 – Citypaq

2.4 Policy framework: regulations that affect/ apply to the mobility solutions

This pilot (mainly Use Case 1) is fully aligned with the current policies of Valencia City Council and the regional government (Generalitat Valenciana) in terms of encouraging the use of bicycles, public transport and intermodality between them as an alternative to private vehicles.

As mentioned in D.4.2, the city of Valencia is promoting a change in citizens' mobility behaviour, focusing on mobility policies towards more environmentally friendly modes of transport. For example, the city's cycle network has been extended by more than 75% in previous years, reaching a total length of 145 km by 2018, while improving the interconnection between the cycle lanes of the different areas and developing a cycle ring in the city centre. In addition, new business models have been tested to improve bicycle use. In particular, Valencia has a public bicycle sharing system created in 2010 with 275 stations and 2,750 bicycles. Thanks to this experience, other neighbouring cities have also set up public bicycle systems. These measures have led to an increase in bicycle use of over 15% in the last year and a 2.7% decrease in the city's total traffic[2].

In regarding the Regional Government, the Basic Mobility Plan for the Metropolitan Area of Valencia was defined in July 2018. As detailed in D4.2, the action line "Intermodality as a priority in metropolitan mobility" envisages the development of a network of bicycle parking facilities at public transport stops. The proposal, proposes 21 safe bicycle parking spaces (closed areas at suburban stations and 35 at metropolitan metro stops). Threfore, the SPROUT pilots are framed within this line of action. In this sense, SPROUT has acted as preliminary case of study to be widely implemented on the Metropolitan metro network, Based on the results of SPROUT policies and recommendation will be define in order to support the full implementation of the strategy towards the implementation of the intermodality at metropolitan area.

New business models for urban freight transport have also been tested to improve the distribution of the last kilometre using tricycles. Today, there are several companies that have implemented this type of last mile distribution that can save around two tons of CO_2 per year per tricycle according to the pilot experiences carried out in the framework of SMILE project, funded by Interreg Med Programme.

The plans and strategies of the regional government and the city council regarding to sustainable mobility are explained at D4.2 and resumed at the Annex 1.

2.5 Stakeholders involved

The following partners and stakeholders have contributed to tasks related to the testing and evaluation of pilot solutions, policy improvements to these pilots, and new city-led mobility proposals. The description of each of them and their role in the Pilot is in Annex 3.

[2] Based on the City Council of Valencia information

Table 1: Valencia pilot participants

Name	Description	Role
Fundación Valenciaport (Innovation Centre)	Fundación Valenciaport is an Applied Research, Innovation & Training centre providing services to the port and logistics cluster. This initiative of the Port Authority of Valencia has enjoyed the collaboration of notable businesses, universities and institutions from the port community. Urban transport, of both freight and passengers, has a major impact on cities in terms of pollution, noise and congestion. Fundación Valenciaport collaborates with the main entities that have the capacity to establish policies to improve the port-city interface, reduces externalities and ultimately contribute to the target of zero emissions by 2050 set by the European Commission.	It is the partner in charge of coordinating the pilot in the city of Valencia and has been involved in the project from the beginning. It coordinates the participation of all Valencian partners and stakeholders in the project, is in charge of communication with the project leaders, carries out deliverables, organizes workshops, designs and conducts surveys, and participates in the ones that some work packages require, coordinates the implementation of use cases, is in charge of data collection and evaluation, contributes to the definition of policies and participates in the dissemination of the project.
Ferrocarrils de la Generalitat Valenciana (Public Transport Operator	FGV manages the transport services of Metrovalencia and the Alacant TRAM. Metrovalencia encompasses the metro and tramway network that covers the city of Valencia, its metropolitan area and areas of influence. It has 133 stations distributed along 156 kilometers. TRAM Metropolitano de Alacant, whose network serves the city of Alacant, its metropolitan area and the axis of the Costa Blanca to Denia, has 71 stations distributed along five lines linking 13 municipalities.	It is a valuable partner for the pilot of Valencia in all its dimensions. FGV has been involved from the beginning of the project in the implementation of the pilot, its evaluation and the proposal of policy improvements. Specifically, it actively FGV has participated in the formulation, prioritization and validation of alternative policies responses. And additionally, it has actively participated in all project dissemination activities.

Name	Description	Role
Regional Government, Territorial Policy, Public Works and Mobility Department)	The Department of Territorial Policy, Public Works and Mobility is assigned the competences in matters of territorial structuring, landscape, transport, ports, airports and public works. It is responsible in the local government for sustainable mobility initiatives	Proposes and validates public policies. Participates through FGV. It has led the institutional inauguration of the Cicloparcs. Participates in surveys and workshops. It is monitoring the pilot progress follow-up as results
Ayuntamiento de Valencia (Valencia City Council)	It is responsible for urban mobility in the city of Valencia in all its aspects: policies, plans, projects and management. It also has the Municipal Bicycle Agency of Valencia, a public entity of the Valencia City Council that is responsible for coordinating the necessary measures to increase the use of bicycles in an appropriate and safe way, both in the city of Valencia and in its municipal area.	It is a necessary partner for the success of the pilot of Valencia. It has validated the policies, has given information about public measures of sustainable mobility in València, and also participates in surveys and workshops.
Ayuntamiento de Torrente (Torrente City Council)	It is responsible for mobility in the municipality of Torrent and collaborates in the definition of the connections of the municipal transport networks. It actively participates in the project in two aspects.	On the one hand, it has collaborated in the selection of the location of the Torrent-Avinguda Cicloparc, has ceded the public land where it was installed and has participated in the validation of public policies. On the other hand, it also collaborates in surveys and workshops and has participated in the validation of policies for use case 1.
Empresa Municipal de Transportes (Municipal Transport Cmpany)	It is an entity that provides surface public transport service by means of buses in the city of Valencia (Spain) and some towns in its metropolitan area. It is wholly owned by the Valencia City Council.	It participates in the project as a public administration in workshops and answering surveys. It has a positive and proactive attitude in its own innovation projects and as a collaborator. It has participated in the validation of policies for use case 1.
Autoritat de Transport Metropolità de València (Metropolitan Transport Authority of Valencia)	The Autoritat de Transport Metropolità de València is an autonomous organism of the Generalitat attached to the Conselleria de Política Territorial, Obres Públiques i Mobilitat, with the aim of coordinating the regular public transport of passengers in the Metropolitan Transport Area of Valencia.	It has participated as public administration in workshops giving guidelines and opinion on mobility policies and answering surveys.

Name	Description	Role
Asociación ciclista local (Local bike association)	Valencia en Bici is a group founded in 1990 that defends the bicycle as a means of transport that respects the environment and is friendly to other citizens. They consider that the bicycle is a tool for greening the urban and rural transport system. They are part of a statewide organization, CON BICI, which is a coordinating group of bicycle user groups that is playing a great role in the changes to the traffic law with the aim of making the bicycle a preferential and civilizing vehicle and in the intermodality with rail transport	It has participated in the definition of the needs of the users of the Cicloparcs. They also collaborate in surveys and workshops. It has participated in the validation of policies for use case 1.
Correos, Citypaq	Formerly was the public mail company of Spain but now is a private logistic operator. Citypaq is the bran in charge of e-lockers a quick and easy solution to pick up, send or return parcels through smart lockers. They are located at densely populated neighborhoods, or in places of transit such as supermarkets, gas stations, shopping malls or train and metro stations.	Citypaq was installed on some private locations as supermarkets or gas station in Valencia, but it has been installed in a public space, thanks to SPROUT Correos had the opportunity to offer this service in a public space.It has installed the e-lockers, gets the data and sends it to FVP and has participated in the validation of policies for use case 2.
Mobility technological company		Has collaborated in workshops and surveys. It has contributed to the validation of public policies.
Consultancy company		Has collaborated in workshops and surveys. It also has contributed to the validation of public policies.

The stakeholders can be grouped into different categories according to their role with respect to the Pilot:

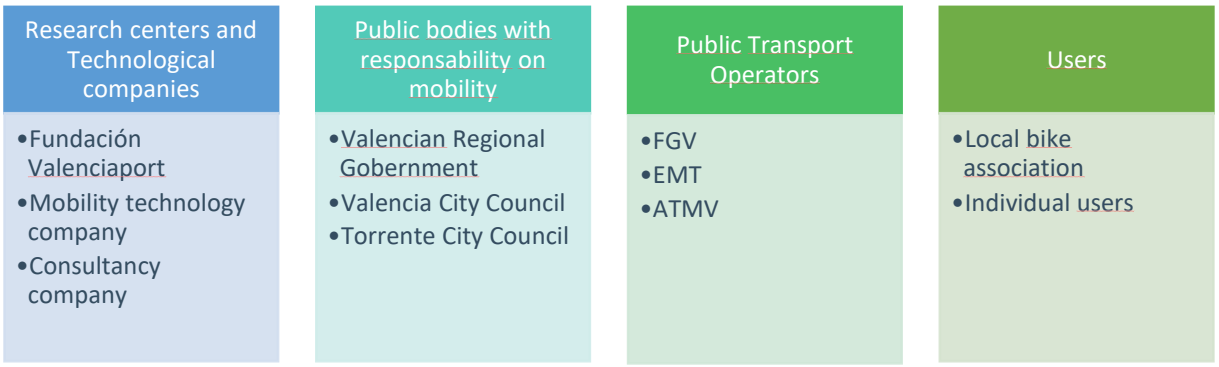


Figure 14. Valencia pilot participants

2.6 COVID-19 Impact and time deviations

COVID-19 has affected the progress of the two use cases in Valencia in different ways, as explained below.

Valencia **Use Case 1**, which consists on the installation of private bicycle parking facilities near metro stations in the metropolitan area, has not experienced any delays in the installation and start-up of activities. Some Cicloparcs have taken some time to open since they have been installed due to the political agenda of regional government officials.

However, due to COVID-19 limited mobility and social distance, the data collection based on Face to Face (F2F) user survey to estimate indicators and measures that could improve the initiative was delayed.

In addition, the COVID-19 restrictions affected to the number of potential users, who either prefer private vehicles for their journeys, or have reduced their journeys due to teleworking or restrictions on commercial and leisure activities (limited opening hours, temporary closures, etc.).

Valencia **Use Case 2**, which involves the installation of e-lockers in two metro stations in the centre of Valencia, has suffered a delay in its implementation mainly because the coordination with the service provider, Correos, took longer than expected. The concession of space for a private company implies a financial consideration. This was the main barrier to implementing the service, as it implies the design of a tariff that is not stipulated in the case of FGV and the signing of a specific contract between the two entities. In this case, as the initiative is part of a European project, a reduced fee was stipulated. It is also necessary for the Correos to provide data to monitor the pilot according to the defined indicators. Correos is a private company with a very hierarchical structure, with highly regulated internal procedures. The negotiation of contracts and conditions on the exchange and use of data must be supervised and approved at different stages in the same way in all cases, whatever their economic dimension. For this reason, in this case the internal processes took longer than expected. This has been the biggest challenges for implementing the use case smoothly.

In addition to this problem, COVID-19 also had a negative impact because during this period, both entities, faced with the urgency of the situation, dedicated resources to reorganise daily work in compliance with health protocols. In addition, the effects of COVID-19 were also seen in the reduction of active staff, as some infected workers had to be quarantined. All these factors led to a delay in the signing of the contract and consequently in the installation of the electronic lockers. After a year, the contract was revised and signed and the smart locker system was put into operation.

Finally, as in the case of Cicloparcs, the reduction in citizen activity has reduced the need for transportation and people have been spending more time at home, which has made it easier for them to receive their parcels.

3 T4.3 Sustainability assessment of the pilots impacts

3.1 Use case 1: Integration between bikes and public transport means into an intermodal node by the installation of secure bike parking at metro stations.

3.1.1 Data collection

In order to collect information to measure the impact of the use case 1, implementation of the bike parking on metro stations, three main tools were designed:

- **Technological data collection system**: the first method of measuring the use of the bicycle parking consists of a system that counts the openings of the parking door, this counter registers in real time the entries of the users. FGV records the following data:
    a. User's card: in order to use the facilities, the metro user must register his transport pass on the Metrovalencia website, therefore the system checks that this card is registered and allows him to open.
    b. Time and date of entry
    c. Time and date of exit

Table 2: Use case 1: Example of data collected by the technological system for Cicloparc

date	time	devSite	nprod	rfid	tag_id
01/02/2021	11:31:25	E-056	ALBORAIA PA	9C86131A	437487260
01/02/2021	17:42:45	E-056	ALBORAIA PA	72F0D3E0	3771986034
01/02/2021	17:55:21	E-056	ALBORAIA PA	4,6001E+75	1897791558
02/02/2021	16:30:51	E-056	ALBORAIA PA	76EC977B	2073554038
03/02/2021	18:16:35	E-056	ALBORAIA PA	B6CE9A7B	2073743030
03/02/2021	18:21:52	E-056	ALBORAIA PA	6EECE007	132181102
03/02/2021	20:36:11	E-056	ALBORAIA PA	F647F62E	787892214
03/02/2021	20:36:15	E-056	ALBORAIA PA	F647F62E	787892214
04/02/2021	7:56:57	E-056	ALBORAIA PA	A4D93E7C	2084493732
04/02/2021	8:27:16	E-056	ALBORAIA PA	A4D93E7C	2084493732
04/02/2021	15:31:12	E-056	ALBORAIA PA	E2EABEE0	3770608354
04/02/2021	16:11:39	E-056	ALBORAIA PA	E587BECA	3401484261
04/02/2021	16:14:39	E-056	ALBORAIA PA	E587BECA	3401484261

The data of the FGV Cicloparcs participating in SPROUT (Torrent-Avinguda and Empalme) and the two additional ones (Alboraia-Peris Aragó and Quart) are available.

- **KPIs estimation system:** for the Cicloparcs we have the raw data mentioned in the point 1, that need to be processed. So, in order to analyse the data base collected by FGV, FVP has designed an Information Technology (IT) system that estimated:
    a. The number of daily uses of the parking
    b. Most frequent users
    c. Number of users by week day

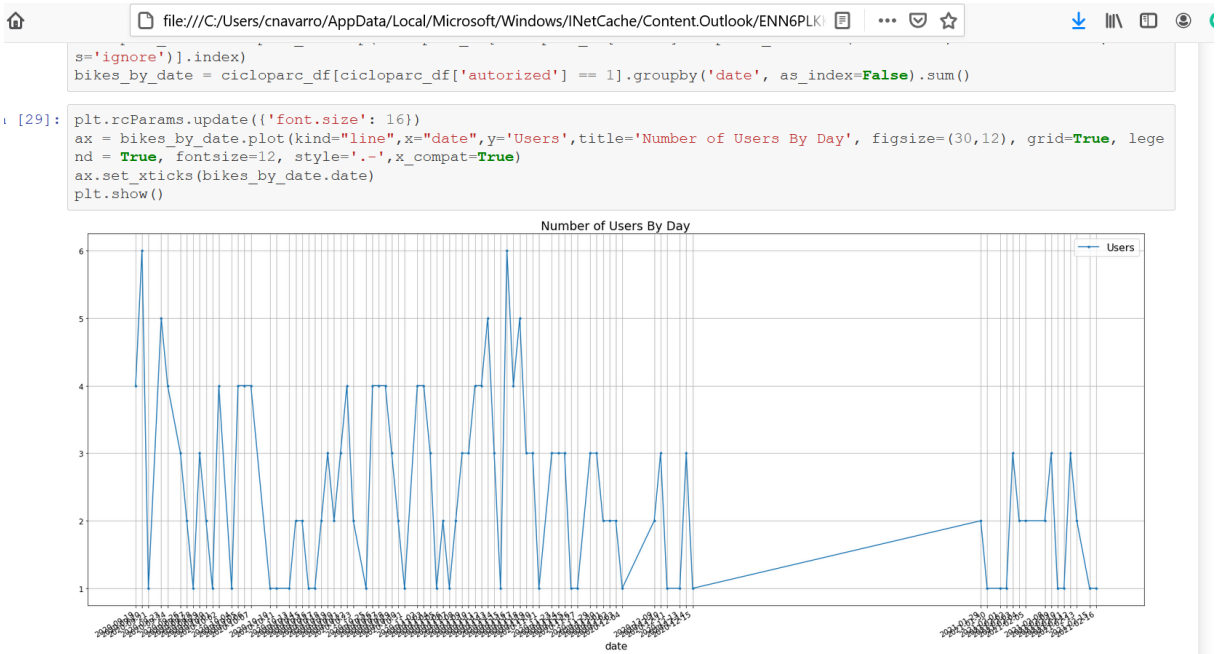


Figure 15: Use case 1: KPI estimation system

Power BI[3] has been used to analyze the Cicloparcs data. The results are presented in the following section

- **Questionnaire for users and potential users**: this questionnaire aims to collect information on the use of Cicloparc with two objectives:

  1) To be able to estimate the potential savings in emissions due to the implementation of this measure, and changes in the modal pattern.

  2) To identify possible improvements to promote the use of this alternative by encouraging intermodality between the metro and the bicycle and reducing the use of private vehicles.

For the data collection, people from the FVP team were during different days over two weeks to the vicinity of Torrent Avinguda station, where the first bicycle parking was installed to collect the information, additionally this questionnaire will be available online for completion.

The design of the survey has taken into account that people may be in a hurry and therefore have limited time to answer. The questions should be very clear, without giving rise to different interpretations or requiring clarification, and should be kept to a minimum in order to obtain the necessary and sufficient information to calculate the indicators.

The complete questionnaire can be consulted in the Annex 5.

3.1.2 Financial analysis

With regard to the financial analysis of each Cicloparc, considering an acquisition cost of 14,000 euros and an annual maintenance and operating cost of 1,000 euros, it has been

[3] Power BI is a Microsoft data analysis service aimed at providing interactive visualizations with an interface simple enough for end users to create their own reports and dashboards on their own.

possible to calculate the minimum price for parking the bike that should be added to the ticket for financial profitability according to the number of daily users (Figure 16).

The analysis is described on Annex 6, that reveals that the price of the ticket should range from €6.58 when there is only one user per day throughout the year, to €0.41 for 16 users per day.

For the current occupancy values of 3 or 4 users, the cost of the Cicloparc to be added to the ticket would be €2.19 and €1.64 respectively.

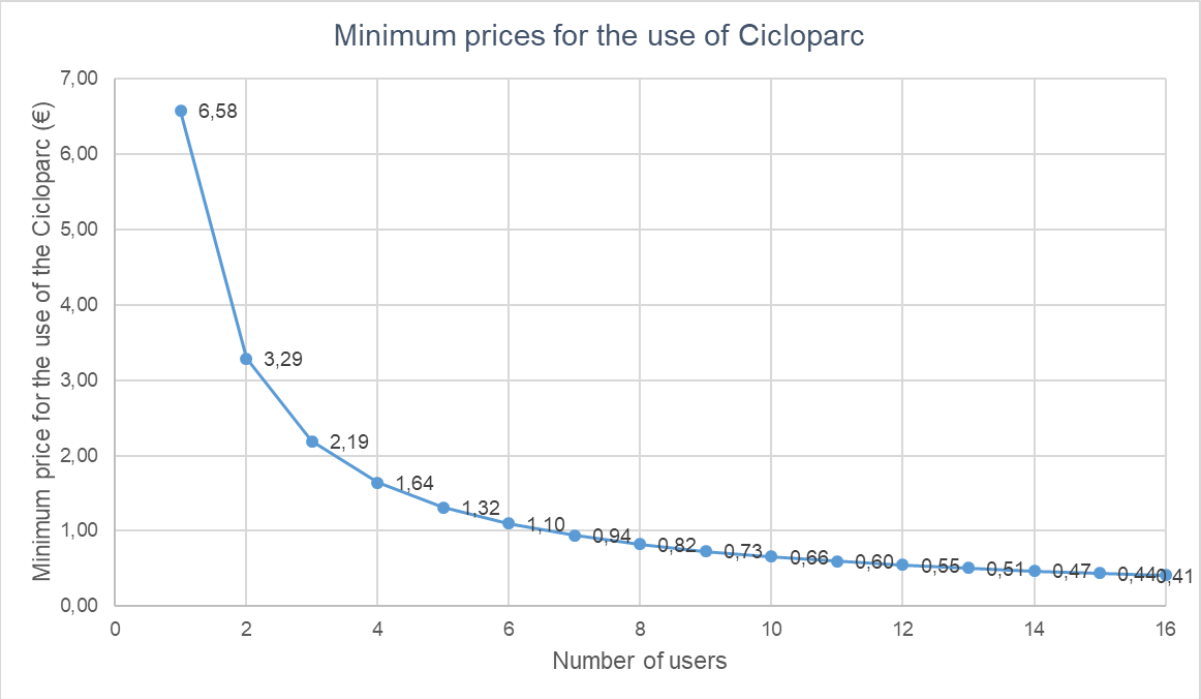


Figure 16: Use case 1: Cicloparc price for user

As a measure to encourage their use and attract passengers, FGV has assumed the cost of the Cicloparcs and the service has been offered free of charge in all of them since they were put into operation.

3.1.3 Sustainable impact assessment analysis

Comparing the results of the initial survey and the survey carried out in Torrent-Avinguda to obtain data after the implementation of Cicloparc, the following conclusions are obtained:

- Before the Cicloparc, 2% of the users who answered the survey used the bicycle to access the station and left it badly parked in the surroundings (near but more than 200 meters away from the metro access).
- After the Cicloparc, there are 4 regular users (identified by their metro card ID number). one was already using a bicycle, another was walking to the metro station and now uses the bicycle and the other two were using a car and now use bike+metro.

So, during the first months of Cicloparc's operation, **the change in the modal pattern estimated** by the surveys carried out **consists of going from 1% of users for the combination bike +metro before Cicloparc to 7% of users for bike+metro**. **Therefore, the**

intermodal shift thanks to the installation of the Cicloparc at Torrent Avinguda metro station has increased by 6% (I410).

Regarding to emission reductions, the bike+metro combination is CO_2 neutral because the electricity used by Metrovalencia is 100% emission-free. So, for each new user who abandons the private car in favor of the bike plus metro, the following assumptions have been made:

- the average car trip between origin to Torrent Avinguda Statios is 4 km
- made two journeys per day on weekdays
- there are 260 working days per year
- the average emissions factor for today's typical mix of private vehicles is 0.174 kg CO2/km
- modal share for car users is 10% (according to the mobility questionnaire performed for metro users)
- Torrent annual metro passengers: 1,579,610

Initial emissions before Cicloparc:

Total annual passengers Torrent Avinguda	Total daily passengers by car	Total CO2 emissions (kg)
1,579,610	433	156,628

Real situation after the installation of Cicloparc (3 new bike users shifting from car to bike):

Total annual passengers Torrent Avinguda	Total daily passengers by car	Total CO2 emissions (kg)
1,579,610	430	155,542

CO2 emissions savings:	$\frac{(155{,}542-156{,}628)}{156{,}628}$	**-0.7%**

Potential situation after the installation of Cicloparc:

In this calculation a future situation has been estimated, taking into consideration that the solution is fully accepted by citizens after the maturation and the widespread of the solution. In this situation, the parking slots will be occupied by 75% of its capacity, therefore the Cicloparc will have at least 12 users by day. In this situation, the savings are as follows estimated:

Total annual passengers Torrent Avinguda	Total daily passengers by car	Total CO2 emissions (kg)
1,579,610	421	152,285

CO2 emissions savings:	$\frac{(152{,}285-156{,}628)}{156{,}628}$	**-2.8%**

Based on the current use of Cicloparc (an average of 4 users), a saving of 0.7% of CO2 emissions is achieved, although this situation is expected to improve, as the solution needs

to become more mature in its implementation. For the solution to be fully implemented in the market it is necessary to: 1) gain the confidence of the users (demonstrate that it is a safe solution and that their bikes will not be damaged or stolen) 2) make it widely known (strengthen communication channels) 3) improve the awareness of citizens towards the environment. **Assuming an average car park occupancy of 75%, which would mean 12 daily users of Cicloparc, the CO2 savings would rise to 2.8% (I404).**

3.1.4 Operational feasibility analysis

KPI	Description	Main findings/Results
Usability	Number of users	The following conclusions have been obtained from the analysis of data from the Cicloparc by means of Power Business Intelligence (see analysis below): • The most used Cicloparc is the one in Alboraya Peris Aragó (which does not belong to SPROUT) with an average of 4 bikes per day in October 2021, 7 simultaneous users at the most and a growing trend of users. (Figure 17). • Of the two included in SPROUT, Torrent Avinguda had an average occupancy of 2 daily users although it is rising and in October 2021 several days there have been 3 users. The maximum has been 4 users per day, although with a lower growth than in Alboraia. (Figure 18). • The Cicloparc of Empalme (included in SPROUT) has not had any success. There is only one user, and not every day. (Figure 19). • Finally, the Cicloparc de Quart (not included in SPROUT) has a regular user since the summer because there was another one who no longer uses it. The maximum daily occupancy detected is 2 users. (Figure 20). • The use of Cicloparcs is not completely linked to commuting to work. This is detected by the duration of parking. Considering the most used ones, for Alboraia Peris Aragó an average bicycle parking of 7'47 hours on average and for Torrent of 9'03 hours is detected. (Figure 21)

KPI	Description	Main findings/Results
		• Users tend to leave their bicycles early in the morning and pick them up in the afternoon, some before 18h and others after. (Figure 22) • Regarding the profile of users, considering all the Cicloparcs, 74% are occasional, 12% frequent, and 14% regular users. (Figure 23)
Reliability	Number of incidences in accessing to the parking.	4 incidences during the first week of implementation of the Cicloparc, some errors detecting the cards for opening 1 small fire in one of the station's manholes and affected several services and equipment, the station was out of service during two days (4 and 5th May 2020)
Security	Number of incidences (theft, damages, etc.).	0 (no theft nor damages in any of the Cicloparcs installed) .
Portability	Degree to which a product is transferable	The Cicloparc model was installed at two initial metro stations (Empalme and Torrent Avinguda) and it was transfer to other 2 in the metropolitan area of Valencia (Alboraya-Palmaret and Quart) and 1 in other city on Valencia Region, Benidorm Station in Alacant city.

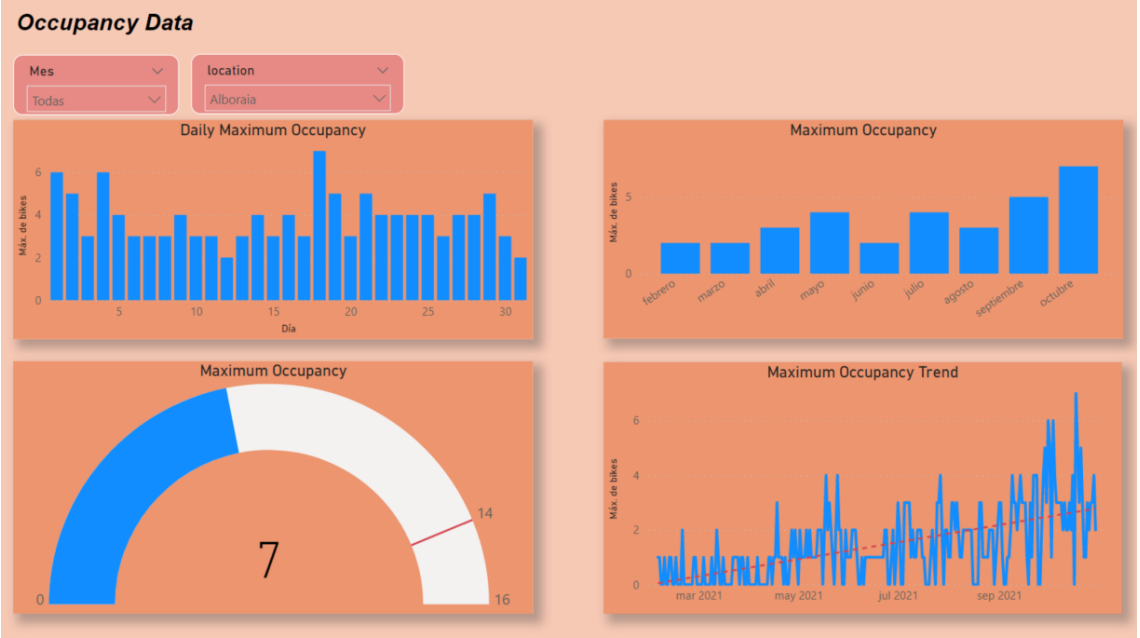


Figure 17. Use case 1: Analysis of occupancy of the Alboraia Peris Aragó Cicloparc

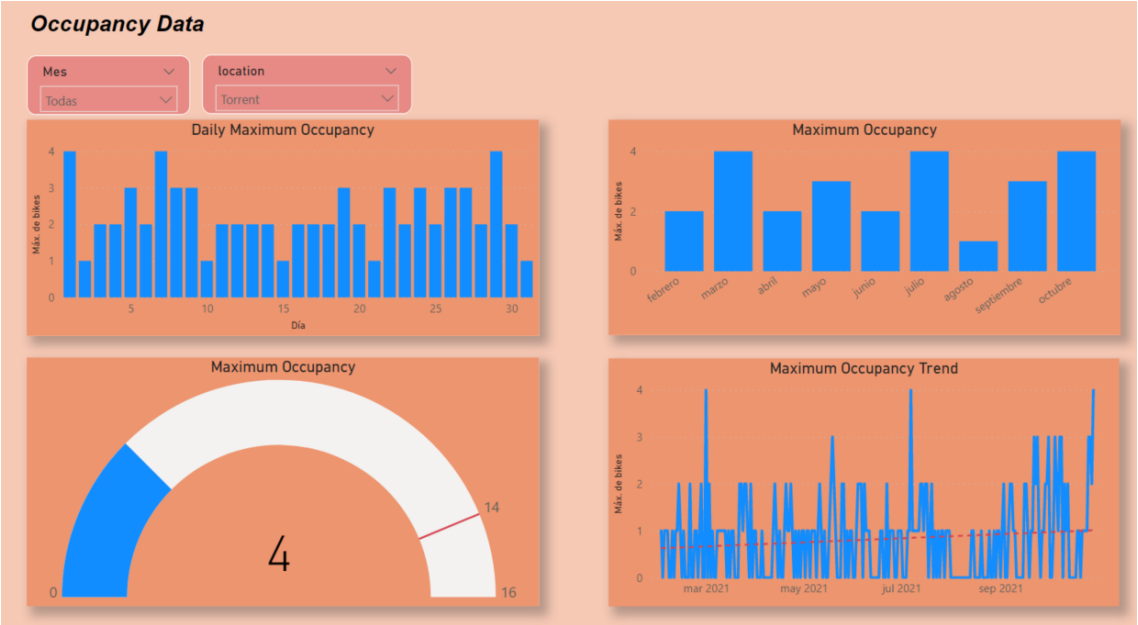


Figure 18. Use case 1: Analysis of occupancy of the Torrent Avinguda Cicloparc

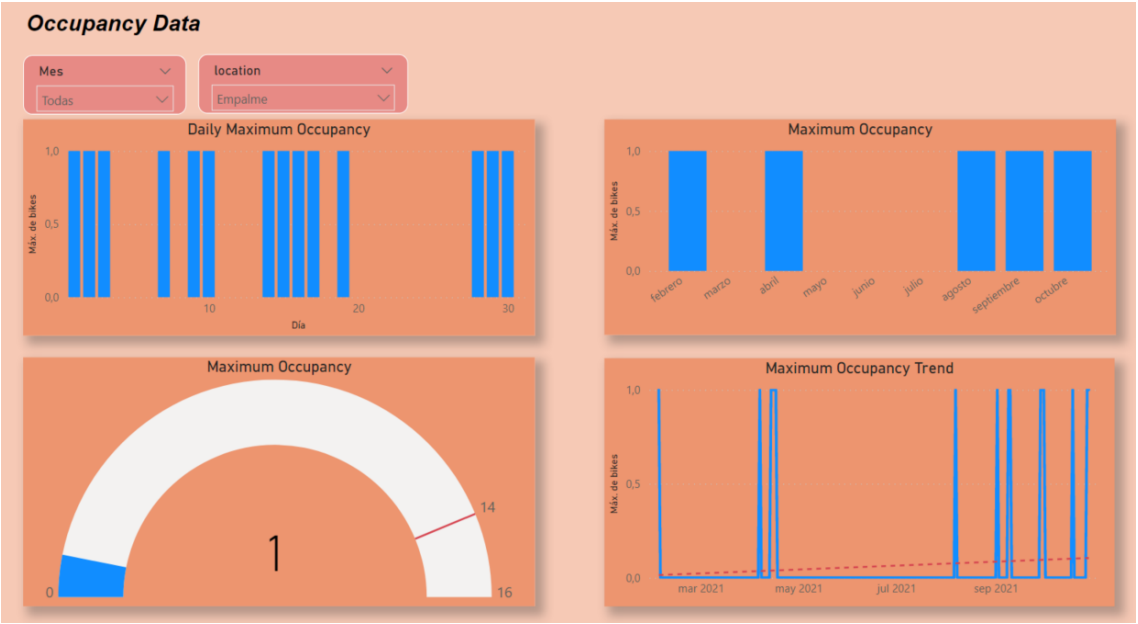


Figure 19. Use case 1: Analysis of occupancy of the Empalme Cicloparc

Figure 20. Use case 1: Analysis of occupancy of the Quart Cicloparc

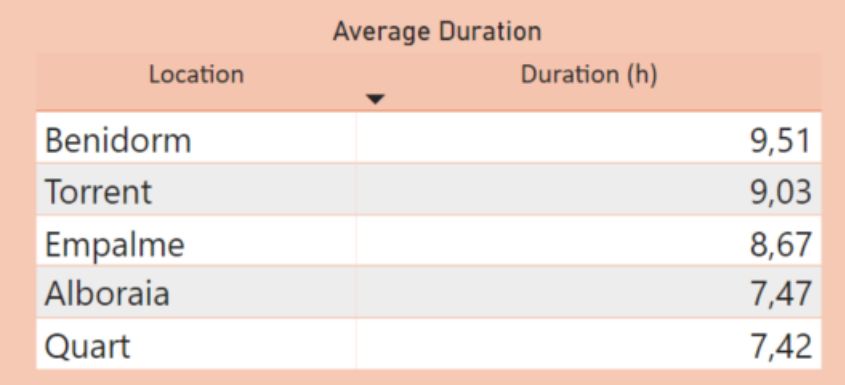


Figure 21. Use case 1: Average of occupancy hours

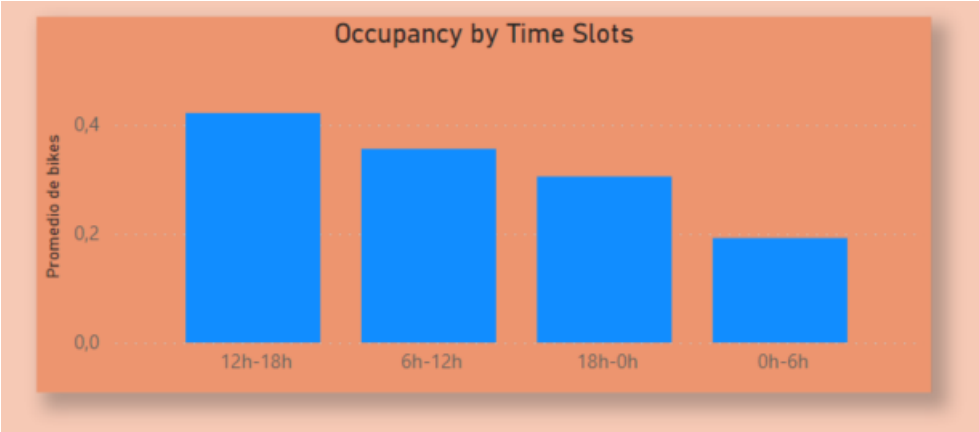


Figure 22. Use case 1: Occupancy slots for Cicloparcs

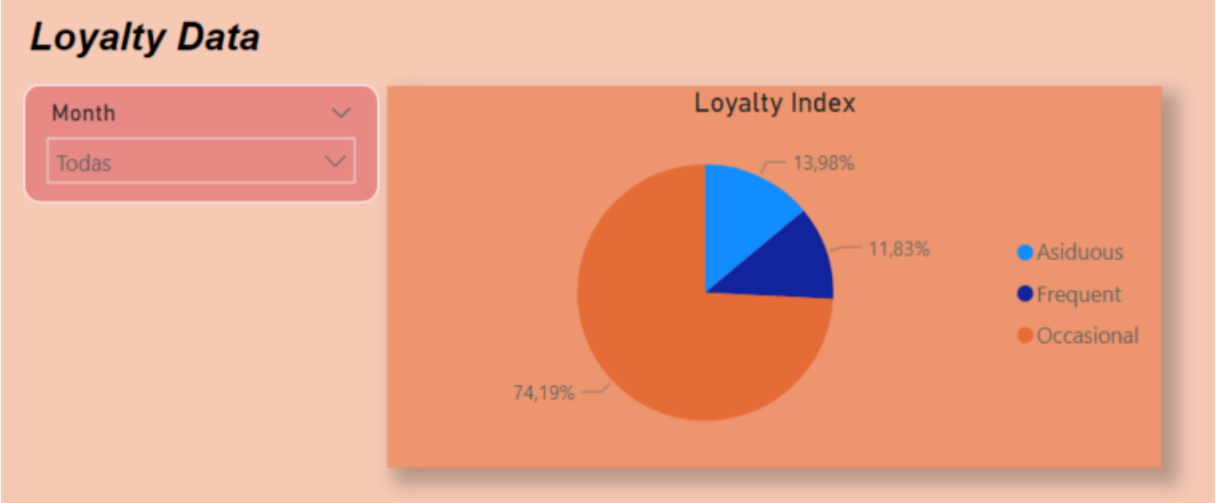


Figure 23. Use case 1: Analysis of kind of users according to loyalty

3.2 Use case 2: Integration between passenger and last-mile freight transport through the co-location of new advanced services (e-lockers) into an intermodal node (metro station).

3.2.1 Data collection

In order to collect information to measure the impact of the use case 2, implementation of the e-lockers on metro stations, two main tools have been used:

- **Data collection from Correos-Citypaq**:
  - There are two Citypaqs, one at Xàtiva station and the other at Colón station.
  - The one in Xàtiva was installed on June 1, 2021, and until November 30 has received **76 parcels**, with an occupancy rate of 1%
  - The one in Colón was installed on June 23, 2021 and until November 30 has received **185 parcels**, with an occupancy rate of 3%
  - Each Citypaq has 24 slots and its cost is 3.345€, with a maintenance cost of 3.10€/month
  - The shipping rate is 2.50 EUR/shipment
  - The unit cost per shipment is 1.84 EUR/shipment
- **Questionnaire for users and potential users**: this questionnaire aims to collect information on the use of Citypaq with two objectives:

  1) To be able to estimate the potential savings in emissions due to the implementation of this measure

  2) To identify possible improvements to promote the use of this measure. For the data collection, people from the FVP team will come during different days over two weeks to the hall of Xàtiva and Colón stations.

  The design of the survey has taken into account that people may be in a hurry and therefore have little time to answer. The questions should be very clear, without giving rise to different interpretations or requiring clarification, and should be kept to a minimum in order to obtain the necessary and sufficient information to calculate the indicators.

The questionnaire can be found in Annex 2.

3.2.2 Financial analysis

As it is a solution dependent on a private company external to the consortium, a financial analysis has not been performed since it is linked to the company's global business model and therefore there are not enough disaggregated inputs to be able to perform this analysis.

3.2.3 Sustainability impact assessment

For the calculation of GHG emission savings, the results of the SMILE project of the MED program have been used. In the SMILE project, a last mile delivery pilot was carried out in the same area of downtown Valencia where the e-lockers have been installed. In this pilot, interesting data was collected for this case, such as the average kilometers traveled per package until its last mile delivery, which can be assumed to be the kilometers saved by leaving the packages at the Citipaq points in the stations for the customers to pick them up.

So, according to the results of this project, an average emissions factor for last mile parcel delivery vehicles of 0.254 kg CO_2/km and an average distance travelled of 2.5 km per parcel have been considered:

- GHG emission savings in Xàtiva Citypaq = 2.5 km/parcel x 76 parcels x 0.254 kg CO_2/km = 48.26 kg CO_2
- GHG emission savings in Colón Citypaq = 2'5 km/parcel x 185 parcels x 0.254 kg CO_2/km = 117.47 kg CO_2
- From the beginning of their operation until the end of November, between the two Citypaqs, savings of 165.73 kg CO2 are estimated.

GHG emission savings per Citypaq = 6 200 parcels/year x 2.5 km/parcel x 0.254 = 3937 kg CO_2

3.2.4 Operational feasibility analysis

Citypaq has many integrated e-commerce: ZARA, Sfera, MASSIMO DUTTI, PULL AND BEAR, ZARA HOME, STRADIVARIUS, LEFTIES, BERSKA, DECATHLON, CARREFOUR, NESSPRESO, VINTED, CORTE INGLES, AMAZON (only returns, etc., and they are constantly in the process of integration with new stores.

From the user's point of view, the use of Citypaq is less agile as other options Recently there have been a large increase of delivery points in locations such as stationery stores, kiosks, gas stations, etc. even to friendly neighbours without too much identification. is less agile than any of the above mentioned options.

The main outcomes of the impact assessment process are:

- Citypaq was a good soltution before COVID-19, but now there are more options.
- It has been detected the need to simplify access as a user (the selection of this option on e-shopping sites).
- Users will not use this option if they have to pay for it.

3.3 Conclusions

As has been explained, the pilot tested in Valencia consists of the deployment of an "*Intermodal urban passenger/freight node for collective public & private transport*" that includes two use cases:

- Case 1: integration between bikes and public transport means into an intermodal node by the installation of secure bike parking at metro stations.
- Case 2: integration between passenger and last-mile freight transport through the co-location of new advanced services (e-lockers) into an intermodal node (metro station).

The aim of both pilot cases is enhancing the city's mobility, as it helps to reduce traffic congestion, and to reduce the GHG emissions.

Regarding Use Case 1, as **drivers**, it has been identified that regional and local public policies are aligned in the promotion of cycling in Valencia (and other cities) as a sustainable mode of transport and there is a lack of initiatives to integrate the cycling network with other modes of transport. Cicloparcs aim to help close this gap. The main advantages for bicycle users are

that Valencia and its metropolitan area are a very flat and the distances are not very long son therefore it is easy to ride; also there is already an extensive network of bike lanes, and it can be added that, on the part of citizens there is an increase of environmental awareness and a growing interest for healthy lifestyle.

With regard to **barriers,** the most important is the concurrence of public authorities and companies with different competencies that need to act in a coordinated manner. Thus, FGV is responsible for the metro service in the city and its metropolitan area, as well as for the installation and operation of the Cicloparcs. The different city councils have ceded public land for the Cicloparcs. The regional government promotes policies for the use of bicycles. The cities build their cycling networks and the regional government builds the interurban bike lanes.

For implementing the Cicloparcs, the **main challenges** were location selection and security, the price for users, and the connection of Cicloparcs and bike lines. Regarding location, several criteria were used to select the locations in order to maximize the impact of the initiative. There were considered the most crowded metro stations in the metropolitan area. Also there were considered the preferences of the users and passengers traffic data. Another criteria was the availability of space in the vicinity of the stations to locate the Cicloparc and as a determining factor for the users, the guarantee of the security of the installation. For this there has been used cameras and an access system linked to a previous on line registration for the users. This has allowed a safe operation and since the beginning of operations there have been no damages or thefts to the bicycles or the facilities.

Other challenge to overcome has been the price of the cicloparc for users. In the analysis has been demonstrated that is necessary that the use of cicloparc was for free because any cost for users could be deterrent.

With regard the **indicators** linked to main objectives and other factors as usability reliability, security and portability it can be noted that:

- During the first months of Cicloparcs' operation, **the change in the modal pattern estimated** by the surveys carried out **consists of going from 1% of users for the combination bike +metro before Cicloparc to 7% of users for bike+metro**. **Therefore, the intermodal shift thanks to the installation of the Cicloparc at Torrent Avinguda metro station has increased by 6%.**
- Regarding to emission reductions, the bike+metro combination is CO_2 neutral because the electricity used by Metrovalencia is 100% emission-free. So, **based on the current use of Cicloparc (an average of 4 users), a saving of 0.7% of CO2 emissions is achieved.** Considering a **future** average occupancy of 75% which would mean 12 daily users of Cicloparc, **the CO2 savings would rise to 2.8%.**
- With regard **usability**, there is scope to increase the number of users from an avererage of 4 in the most used Cicloparc to 16 (maximum capacity). The use of Cicloparcs is not completely linked to commuting to work but also to other reasons for travel. Users tend to leave their bicycles early in the morning and pick them up in the afternoon. Finally, regarding the profile of users, considering all the Cicloparcs, 74% are occasional, 12% frequent, and 14% regular users.
- In relation to **reliability**, there have been only 4 incidences during the first week of implementation of the Cicloparcs, due to errors detecting the cards for opening.

Additionally, a small fire in one of the station's manholes and affected several services and equipment, the station was out of service during two days (4 and 5th May 2020).

- There have been no **security** problems for people, bicycles or facilities.
- Finally, the Cicloparc model was installed at the two initial metro stations (Empalme and Torrent Avinguda) included in the SPROUT project, and it was transfer to other two stations in the metropolitan area of Valencia (Alboraya-Palmaret and Quart) and one in other city on Valencian Region, Benidorm Station in Alacant city.

For the solution to be fully implemented in the market, under the point of view if policies it is necessary to: 1) gain the confidence of the users (demonstrate that it is a safe solution and that their bikes will not be damaged or stolen); 2) make it widely known (strengthen communication channels); 3) improve the awareness of citizens towards the environment; 4) coordination between public entities about land use, bike lanes network, investment, communication and advertisement initiatives. For example, in this last recommendation, Metro Valencia is going to include at the new metro maps where the Cicloparcs facilities are located.

With regard Use Case 2 as **drivers**, it has been identified the new needs linked to new consumption patterns related to COVID-19 have been identified. On the one hand, during the confinement, electronic sales, which could be easily received at home, increased. At times when prevention measures are not as strict, fear or habit has made it easier for electronic purchases not to decrease but to complicate their collection at home or in the workplace. This situation has been an opportunity to gain users of e-lockers. On the other hand Citypaq has many integrated e-commerce: ZARA, Sfera, MASSIMO DUTTI, PULL AND BEAR, ZARA HOME, STRADIVARIUS, LEFTIES, BERSKA, DECATHLON, CARREFOUR, NESSPRESO, VINTED, CORTE INGLES, AMAZON (only returns, etc., and they are constantly in the process of integration with new stores. The locations were selected with same process than the ones for Cicloparcs: traffic passanger data at metro stations in the city; preferences of users and space availability at the hall of the stations.

With regard to **barriers**, the most important is the need for a contract to cession of space from FGV (public company) to Corresos-Citipaq (a private company).

For implementing the e-lockers, the **main challenge** was the duration of the negotiation of the contract. In other hand, from the user's point of view, recently there have been a large increase of delivery points in locations such as stationery stores, kiosks, gas stations, etc. even to friendly neighbours without too much identification, and the use of Citypaq is less agile than any of the above mentioned options.

Regarding the **KPIs** linked to the objectives, it has been calculated the **GHG emission savings per Citypaq that raise 3937 kg CO_2 per year.**

The **main outcomes** of the impact assessment process are:

- Citypaq was a good solution before COVID-19, but now there are more options.
- It has been detected the need to simplify access as a user (the selection of this option on e-shopping sites).
- Users will not use this option if they have to pay for it.

4 T4.4 Formulation and priotitisation of alternative policy responses

4.1 Introduction

The third stage of the SPROUT project is the setup and implementation of the pilots in each of the pilot cities. The aim of Task 4.4 is to develop, based on the outcomes of the pilots and the operational assessment (Task 4.3), a list of alternative policy responses for each of the 5 pilot cities. The alternative policy responses will then be prioritized for each pilot city with the help of Multi-Actor, Multi-Criteria Analysis (MAMCA) (Macharis, De Witte, & Ampe, The multi-actor, multi-criteria analysis methodology (MAMCA) for the evaluation of transport projects: Theory and practice, 2009).This will allow the identification of synergies and conflicts between different stakeholder groups, to show the (lack of) consensus for the proposed policy alternatives.

Because of the COVID-19 pandemic and the various lockdowns in the Fall of 2020, the implementation of the tasks preceding Task 4.4, and most importantly the implementation of the pilots, was delayed. A traditional MAMCA departs from a problem identified, and formulates alternative solutions to a problem. These alternative solutions are then evaluated by different stakeholder groups to show which alternative has the highest consensus among stakeholders. So as the first step of a MAMCA is a problem identification phase, it was difficult for the pilot cities to come to a problem identification with regards to the pilot due to it not yet being (fully) implemented. This made it difficult to distinguish several potential alternative policy responses. If more than one policy response was proposed, they were not mutually exclusive. This meant that the implementation of one policy alternative did not impede the implementation of the other alternative. For a MAMCA, if there is to be a consensus on one of the alternatives, the proposed alternatives need to be mutually exclusive. If they are not, then the solution would simply be to implement all alternatives. For these reasons, it was decided to implement a modified MAMCA, a Stakeholder-Based Impact Scoring (SIS) instead (te Boveldt, 2019).The methodology and its application will be explained in more details in the section below (Chapter 0).

4.2 Methodology

4.2.1 Multi-Actor Multi-Criteria analysis

Multi-Actor, Multi-Criteria Analysis is an evaluation method that includes both quantitative and qualitative criteria with their relative importance, as defined by multiple stakeholders (Macharis et al., 2009). It is used for the participatory evaluation of projects where multiple stakeholders and multiple objectives are to be included. The aim of MAMCA is to facilitate the decision-making process by showing the conflicts and the synergies of different stakeholders.
The method starts with the identification of stakeholders and their objectives, to then come to a prioritization of different alternatives, based on the weights attributed by stakeholders to their criteria. However, Macharis et al. (2012) highlight the importance of not focusing only on the final aggregated, prioritized results of a MAMCA*, but on the reasons for why an alternative score negatively or positively*. *It allows stakeholders to reflect on their objects, and shows the*

trade-offs all stakeholders have to make. The results of the MAMCA can then start a discussion among stakeholders to find a consensus.

4.2.2 Stakeholder-Based Impact Scoring

Stakeholder-Based Impact Scoring (SIS) is a modified MAMCA that provides a weighted impact evaluation of policy options (te Boveldt, 2019). This impact evaluation considers the objectives of stakeholders that impact, or are impacted by, the problem described, thereby *quantifying the benefits and burdens of project alternatives*. *It was developed for problems that cannot be addressed through the ranking algorithms of other MCA methods*. The SIS method contains two fundamental aspects (te Boveldt, 2019):

- *Non-compensability*: the principle of non-compensability entails that positive and negative impacts are accounted for separately, and do not cancel each other out.
- *Non-relativity*: if there are multiple alternatives, these alternatives are not compared to each other, but to a baseline scenario.

SIS steps

The application of SIS involves seven different steps (te Boveldt, 2019):

1. Formulation of the problem and identification of alternative solutions. In order to perform a SIS, there should minimally be one baseline, and one alternative to the baseline.
2. Stakeholder identification. The stakeholders that impact, or are impacted by the project need to be identified.
3. Formulation of stakeholder criteria. These criteria represent the objectives of the stakeholder with regards to the problem and the identified alternative solutions.
4. The effects of the alternative in terms of each criterion when compared to the baseline scenario are assessed through a performance score ranging from +1 (very positive) to -1 (very negative).
5. Attribution of weights to their criteria by the stakeholders, to evaluate the relative importance of each of the criteria.
6. Impact score calculation of each alternative for each criterion, for each stakeholder. This is done by multiplying the weight of a criterion, as attributed in step 5, with the impact, as assessed in step 4. This impact score will be either positive or negative, and will fall between +1 and -1.

Calculation of the aggregate positive impacts and of the aggregate negative impacts.

4.3 Application of SIS within SPROUT: Use case 1

The application of SIS within the SPROUT project followed the steps described in the previous section. It was applied to one use case per pilot city. In the city of Valencia, the Use Case 1, Ciclooparcs, was selected. The following section describes steps 1-5 more in detail. These steps make up the preliminary work of SIS, i.e. the gathering of all necessary input for the analysis. Section 5 (Results) describes steps 6 and 7, i.e. the results of the analysis, for each pilot city.

4.3.1 Formulation of problem and identification of alternatives

The first step in the SIS is the identification of the problem and the alternative solutions. To do this, a template was sent out to all pilot cities containing questions with regards to issues they had identified with their pilots. This was filled out and sent back to VUB. For Valencia, extra clarifications were asked, as the identified problem and policy alternatives were not specific enough. The goal was for the proposed policy alternatives to be very specific.

The section below gives an overview of the identified problems and proposed policy solutions for the Use Case 1 in the city of Valencia.

Table 1: Use case 1:T4.3 identified problems and proposed solutions

Problems encountered	Dedicated space inside the metro station itself is not always available and therefore the location of the parking should be on the territory of the municipality that is managed by the corresponding city hall.
	Bike infrastructures (bike networks, lighting…) should be well connected with the bike parking, but these infrastructures are not managed or developed by FGV.
Possible Solutions	Fostering mechanism for the collaboration of public entities with different competences but common objectives towards more sustainable mobility and urban logistic, through: • Memorandum of understanding • Working groups/Round tables • Common roadmaps
	Collaboration agreements between municipalities to collaborate in the implementation of sustainable mobility measures. These agreements would contain: • Use the land of any of the public Authority to sustainable mobility purposes. • Sharing information to co-create new mobility services • Regulations to facilitate the installation of mobility services promoted by public entities • Free access to public land for sustainable mobility purposes • The agreement should also include the responsibilities of each public authority (maintenance, insurances, surveillance, cleaning...) • Development of infrastructures needed (for instance the bike parkings installed in metro station should be well-connected to the bike lane network and the authority competent of this infrastructure is different from the public company managing the metro stations and installing the parkings).

4.3.2 Stakeholder identification

In order to come to a weighted evaluation that reflects the preferences of stakeholders, it was necessary to identify the stakeholders to involve in the SIS. The stakeholders to involve are the ones that are impacted, or can impact, the pilot project of the city. To do this, the pilot cities were asked to contact stakeholders that had been previously involved in the scenario building workshops of WP3. The participating stakeholders in WP3, in turn, were the result of the

stakeholder identification done in Task 2.3, 'Urban Mobility Transition Drivers'. After asking the cities to contact some more stakeholders than the ones present for the WP3 workshop, the full overview of participating stakeholders per city is described in the following paragraph:
The following partners and stakeholders have contributed to tasks related to the testing and evaluation of pilot solutions, policy improvements to these pilots, and new city-led mobility proposals:

- **Fundación Valenciaport (Innovation Centre)**

It is the partner in charge of coordinating the pilot in the city of Valencia and has been involved in the project from the beginning.
It coordinates the participation of all Valencian partners and stakeholders in the project, has prepared the workshops, questionnaires, and has elaborated the deliverables.

- **Ferrocarrils de la Generalitat Valenciana (Public Transport Operator)**

FGV has answered the questionnaires and has participated in the workshops, has participated in the formulation, prioritization and validation of alternative policies responses. It also has provided data on the use of Cicloparcs.

- **Ayuntamiento de Valencia (Valencia City Council)**

It has validated the policies, has given information about public measures of sustainable mobility in Valencia, and also participates in surveys and workshops.

- **Ayuntamiento de Torrente (Torrente City Council)**

It also collaborates in surveys and workshops and has participated in the validation of policies for use case 1.

- **Empresa Municipal de Transportes (Municipal Transport Company)**

It participates in the project as a public administration in workshops and answering surveys. It has a positive and proactive attitude in its own innovation projects and as a collaborator. It has participated in the validation of policies for use case 1.

- **Autoritat de Transport Metropolità de València (Metropolitan Transport Authority of Valencia)**

It has participated as public administration in workshops and answering surveys on policies measures related to use case 1

- **Asociación ciclista local (Local bike association)**

It has participated in the definition of the needs of the users of the Cicloparcs. They also collaborate in surveys and workshops. It has participated in the validation of policies for use case 1.

- **Mobility technological company**

Has collaborated in workshops and surveys. It has contributed to the validation of public policies.

- **Consultancy company**

Has collaborated in workshops and surveys. It also has contributed to the validation of public policies.

4.3.3 Formulation of stakeholder criteria

The third step in SIS is the identification of the criteria for each stakeholder group. The key question for the formulation of criteria is the following: *what distinguishes a good project alternative from a bad one?* Stakeholders therefore reflect on what their objectives are with the implementation of a project. These criteria can be both positive and negative, and examples

include traffic safety, cost, or accessibility. Within SPROUT, the alternatives that stakeholders were asked to reflect upon were the pilot situation without policy changes, as well as the pilot situation with the proposed policy alternatives.
In order to collect stakeholder criteria, an email template was set up for all pilot cities. This email, that can be found in Annex 2.2, contains a short description of the pilot without policy changes, and a short description of the pilot including the policy alternatives. The stakeholders were asked to come up with two to six criteria that would make the implementation of the pilot situation with policy changes successful, in their eyes. This step required a lot of exchanges with the city, as it was not always clear from the beginning what was understood by 'criteria'. After two or three rounds however, a consolidated list of criteria for each stakeholder group was obtained.
An overview of the criteria per stakeholder group for Valencia can be found below, and summarized in Table 2:

- Mobility technology company
  - Infrastructure integration
  - Facilitation of intermodality
  - Security for bike owners
  - Emissions reductions
  - Increase in modal shift
- Consultancy companies
  - Infrastructure integration
  - Facilitation of intermodality
  - Improving end-user experience
  - Increase in environmental awareness of citizens and businesses
  - Reduction of car use
  - Cost for users
- Local bike association
  - Facilitation of intermodality
  - Safety for bikers
  - Cost of investment
  - Accessibility to bike owners
  - Emissions reduction
  - Reduction in noise pollution
- Metropolitan Mobility Authority
  - Increase in PT digitalization
  - Facilitation of intermodality
- Municipal Transport Authority
  - Accessibility for bike owners
  - Security for bike owners
  - Infrastructure integration
  - Cost for users
  - Ease of use
- Metropolitan Metro Company
  - Increase in environmental awareness
  - Security for bike owners
  - Infrastructure integration

    - Integration with other electric vehicles
- Torrent City Council
    - Infrastructure integration
    - Facilitation of intermodality
    - Increased safety for pedestrians and cyclists
    - Cost of investment

Table 2: Use case 1: T4.4 stakeholders' objectives

	FGV	EMT	ATMV	Torrent city council	Bike's users association	Technological companies	Consultancy companies
Infrastructure integration	x	x		x		x	x
Facilitation of intermodality			x	x	x	x	x
Security for bike owners	x	x			x	x	
Emissions reductions					x	x	
Increase in modal shift						x	
Improving end-user experience							x
Increase in environmental awareness	x						x
Reduction of car use							x
Cost for users		x			x		x
Cost of investment				x			
Accessibility to bike owners		x			x		
Reduction in noise pollution					x		
Increase in PT digitalization			x				
Ease of use							
Integration with other electric vehicles	x						
Increase safety for pedestrians				x			

4.3.4 Expert evaluation

After the identification of stakeholder criteria, the next step of the SIS is an evaluation of policy intervention on the impact of the policy interventions on these criteria by experts. In this step, the effects of the pilot with policy implementation are compared to the pilot without policy changes for each of the criteria. The alternative is given a performance score on a 7-point scale, ranging from 'Very negative' to 'Very positive'. The key question to answer in this step is the following: in terms of each criterion, *what are the impacts if the alternative pilot with policy changes were implemented?*

The scientific partners in each of the pilot cities were asked to evaluate the alternative in terms of their stakeholders' criteria. Annex 8.3 contains the email with explanation that was sent out to the scientific partners. If the experts had any additional information or justification for their evaluation, they were asked to add this to the evaluation form as well. Below, the results of each expert evaluation are shown.

Table 3. Use case 1: Pilot experts' evaluation results

Criteria	Scenario 1: current situation	Scenario 2: pilot compared to current situation	Performance score of the pilot compared to current situation	Justification for the chosen evaluation
Infrastructure integration	Smart bike parkings at selected metro stations	Smart bike parkings at selected metro stations, with the development of additional infrastructure. The bike parkings will be well connected to the bike lane network and the authority responsible for the infrastructure will be different from the public company managing the metro stations and installing the parking.	very postive	For cyclists, it is very convenient to access the metro using cycle lanes and the Cicloparc. Scenario 2 is a clear improvement in this aspect.
Facilitation of intermodality			very postive	The Cicloparc facilitates the substitution of journeys that were previously made by car and can now be made by bike+metro. In addition, the bike parking next to the metro reduces travel times by not having to park the bikes further away from the station, which is an incentive for users.
Security for bike owners			very postive	The Cicloparc substantially reduces the chances of theft or damage to bikes.
Emissions reductions			slightly positive	GHG reduction will depend on the number of users, which for now is not very large.
Modal shift			slightly positive	Modal shift achieved depends on the number of users, which for now is not very large.
End-user experience			positive	Cicloparc improves the experience for those who already use bike+metro (security, comfort, total travel time), and also for those who have changed their mode of travel. Scenario 2 adds safety and more users that were reluctants due to safety or time.
Environmental awareness			very postive	The location of the Cicloparc next to the metro station improves environmental awareness among both users of the Cicloparc and the metro, as well as non-users. It reinforces the idea of sustainability of non-motorised (bike) and public (metro) means of transport compared to private vehicles.
Reduction of car use			slightly positive	Reduction of car use depends on the number of users, which for now is not very large.
Cost for users			very postive	The use of Cicloparc is currently free of charge.
Cost of investment			slightly negative	FGV pays for the Cicloparcs and their installation. The cost is not very high, and is covered by the regional government's general budget. The local councils provide public land free of charge.

Criteria	Scenario 1: current situation	Scenario 2: pilot compared to current situation	Performance score of the pilot compared to current situation	Justification for the chosen evaluation
Accessibility to bike owners			very postive	Accessibility to the metro for bicycle users is substantially improved. Before, they had to leave their bikes in the vicinity of the station, in the open air, on bike racks or illegally leaning on lampposts, benches, etc. Scenario 2 adds safety so more users that were reluctants due to safety could be encouraged to use their bikes to get to the station.
Reduction in noise pollution			slightly positive	Reduction in noise pollution depends on the number of users, which for now is not very large.
Public transport digitalization			slightly positive	FGV controls the access to Cicloparcs by the Metrovalencia user card, storages the data, has surveillance cameras. These are new IT tools
Ease of use			positive	access to the Cicloparc is by swiping your metro user card through a reader at the door of the facility and is free of charge. all you have to do is register on the Metrovalencia website.
Integration with other electric vehicles			no change	Cicloparcs do not change the use of electric vehicles in their vicinity. Maybe they could affect the rental of shared-use electric motorbikes if someone who used to use these vehicles to get to or from the metro to their destinations now uses their private bike. the number of users, which for now is not very large. It would be a very rare case and so far, the number of users is very small.
Increased safety for pedestrians and cyclists			very postive	Scenario 2 is a great improvement in this respect by separating the circulation of bicycles from vehicles on the one hand (safety for cyclists), and on the other hand preventing bicycles from riding on pavements (safety for pedestrians).

4.3.5 Criteria weighting by stakeholders

The next step in a SIS evaluation is the attribution of weights by the stakeholders to their criteria. This shows the relative importance that the stakeholders attach to each criterion. To evaluate this, a survey was set up to be distributed to all stakeholders within each of the pilot cities. The survey was set up by VUB, and an example for the city of Kalisz can be found in Annex 8.4. To facilitate the process for the stakeholders, it was decided to translate the surveys in the local language. This was done by each pilot city.

4.3.6 Results

This section provides the result of the SIS analysis for all pilot cities (steps 6 and 7).

Figure 24 and Figure 25 show the negative and positive impacts of the Valencia pilot as compared to the current situation. While the current situation (Smart bike parkings at selected metro stations) is taken as a baseline, the pilot involves the development of additional infrastructure: the bike parkings will be well connected to the bike lane network and the authority responsible for the infrastructure will be different from the public company managing the metro stations and installing the parking.

As can be seen in Figure 24, facility of intermodality, infrastructure integration and security for bike owners are by far the most important potential positive impacts, as these impacts are deemed important by most stakeholders, followed by the criteria 'increase in environmental awareness' and 'accessibility to bike owners'. 'Cost of investment' is the only negative impact, but its effect is expected to be relatively minor.

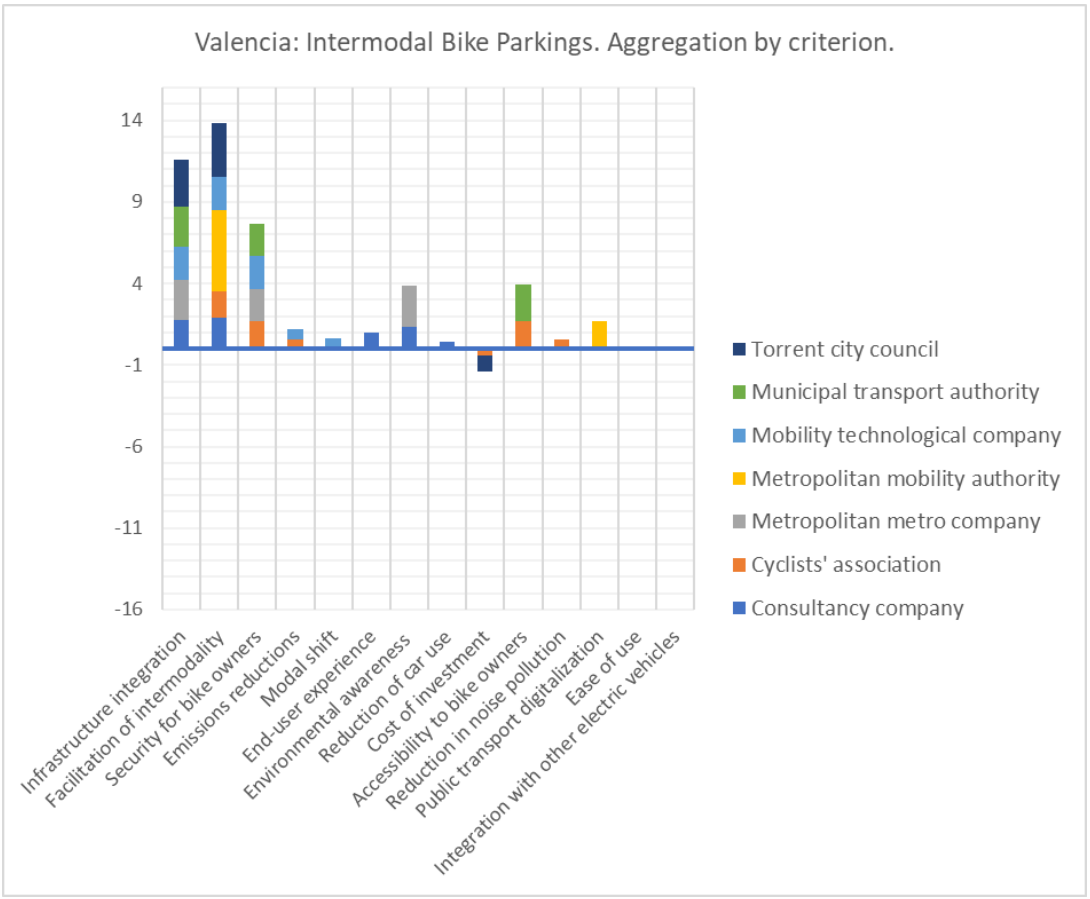


Figure 24- Valencia Use case 1: Intermodal bike parkings. Aggregation by criterion.

Figure 25 shows the distribution of positive and negative impacts over the different stakeholders. We can see that in positive impacts are more or less equally distributed and that the only expected negative impact, 'cost of investments' is relevant for the Torrent city council and to a lesser degree to the cyclists' association.

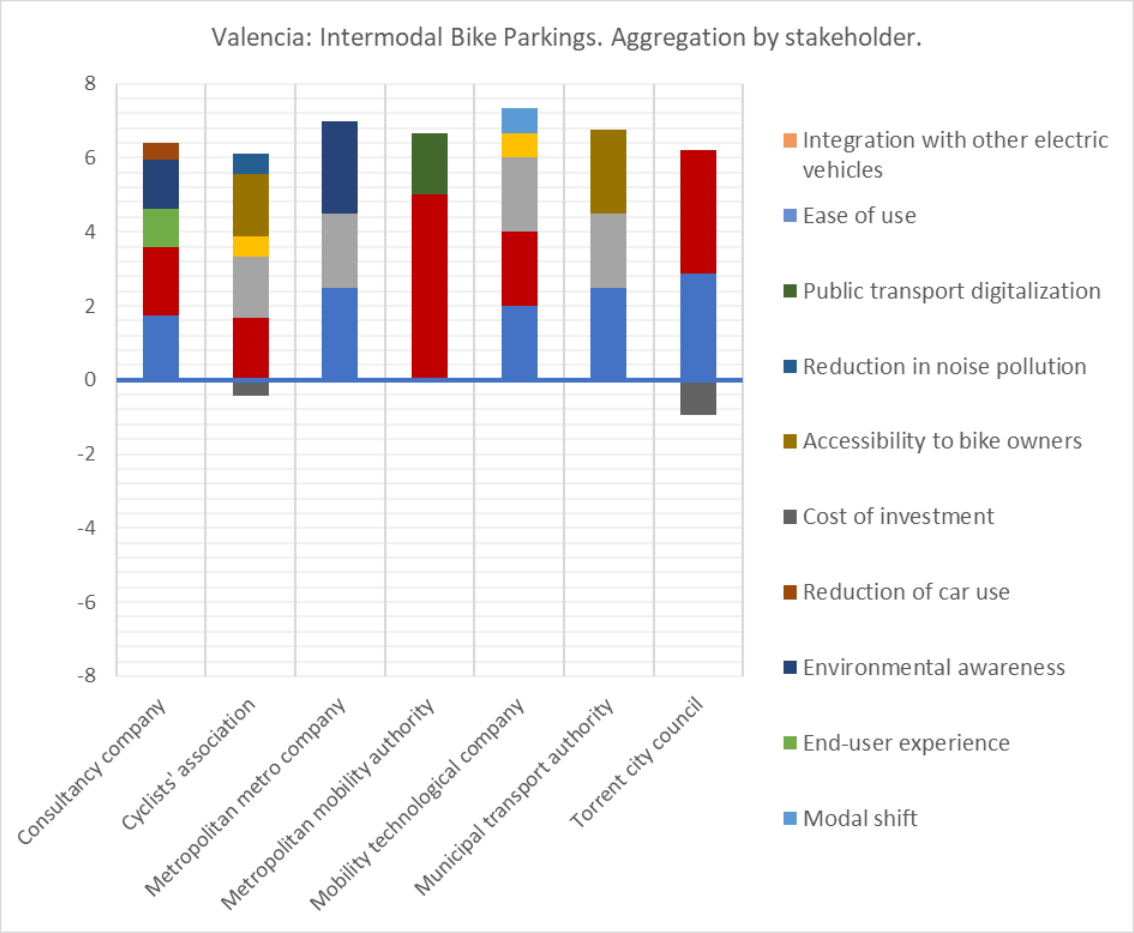


Figure 25. Valencia Use case 1: Intermodal bike parkings. Aggregation by stakeholder.

4.4 Conclusion

Compared to the pilot as it is, the development of additional infrastructure such as a good connection of the parkings to the bike lane network, as well as different authorities being responsible for the infrastructure and for the management of the metro station, has positive effects on all stakeholders. The only negative effect is felt by the Torrent city council and the Cyclists' association in terms of 'costs of investment'. The mobility technology company is expected to feel the most positive impact, although the difference with the other stakeholders is relatively small. The most important criteria, across all stakeholders, are the facilitation of intermodality, infrastructure integration and security for bike owners.

5 T4.5 City-specific policies for harnessing the impact of new mobility solutions

5.1 Introduction

The objective of this task is to compile the information to assess the feasibility and user acceptance of introducing the predefined set of policy responses on a limited scale (city-specific). This task uses some information from the previous tasks 4.4, more specifically the set of stakeholders and preferred set of policy responses. About the latter, by the time the T4.4 was implemented the pilots were not able to distinguish several potential alternative policy responses that were mutually exclusive (see section 4), therefore prior this exercise additional policy responses were identified by the methodological partners (VUB, CERTH, ZLC) and shared with the pilots. Then they validated and fine-tuned to better address pilots' characteristics. The result of this task is the combination of champion city-specific policy responses or city-led policy response.

5.2 Methodology

Implementation of effective policy responses that will harness the benefits of the emerging mobility solutions represents a challenging process which can be viewed as a knowledge quest and creation process within an urban stakeholder's network requiring the reduction of uncertainty. Uncertainty is particularly high for those measures that include new science, technology, markets, regulatory frameworks. The types of uncertainties can be categorized as being concerned with technological feasibility, organizational capability and social acceptability.

In order to minimize the uncertainty in implementation of a policy measure and at the same time to maximize its effectiveness, the Task 4.5 will address three main research questions per each pilot:

1. How to assess the policies implementation feasibility?
2. How to assess the policies, user acceptance?
3. How to determine threshold user acceptance and feasibility values for selecting policy responses?

5.2.1 Implementation feasibility

About the first question, the policy implementation feasibility will be addressed by the following steps:

1. Selection the relevant feasibility criteria;
2. Ranking the relevant feasibility criteria by the stakeholders and determining the most critical criteria;
3. Detailed analysis of the most critical feasibility criteria in order to identify potential infeasibilities;
4. Determining a set of actions to avoid the risk of infeasibility during the implementation of a policy measure.

The set of feasibility criteria will include the following dimensions:

1. Technical feasibility;
2. Financial feasibility;
3. Political feasibility;
4. Administrative feasibility

Detailed explanation of the feasibility criteria included within each of these dimensions are explained below.

1. ***Technical feasibility*** dimension includes following feasibility criteria:
   - Effectiveness: the extent to which the alternative policy measure will reach the goals set in the project statement;
   - Feasibility of implementation: Under this category will be assessed whether technology exists or is readily available to implement an alternative policy measure.
2. ***Financial dimension*** includes impact on the local/regional economy, on expected revenues of public sector or on expenses of local/regional government. Within the financial dimension costs and benefits will be considered. Costs represent the most common financial criteria. The following categories of costs will be considered:
   - Direct costs: the costs directly related to the policy alternative;
   - Indirect costs: additional nonfinancial impacts (noise, congestions, accidents, etc.);
   - Fixed costs: initial investments;
   - Operations and maintenance costs;
   - Opportunity costs.

   Benefits can be measured in the same ways as costs. The following categories of benefits will be included:

   - Direct benefits: financial effects which are directly attributable to the alternative policy measure;
   - Indirect benefits: non-financial effects which are indirectly attributable to the alternative policy measure.
3. ***Political feasibility*** includes two feasibility criteria:
   - Acceptability: Whether or to what extent the alternative policy measure will be acceptable to relevant stakeholders (decision makers etc.).
   - Responsiveness: whether the proposed alternative will meet the real/perceived needs of the target groups.
4. Since alternative policy measures will be implemented by public authorities, it is necessary to assess ***administrative operability or administrative ease of implementation***. Therefore, the following criteria under the administrative feasibility will be considered:
   - Authority: does the public body have the authority to implement the proposed policy?
   - Commitment: to what extent the policy measure has the commitment of different levels of decision making?
   - Capacity: does the public authority have the resources to implement the proposed policy measure (skills, financial assets, training, expertise)?

The questionnaire will be used to assess the critical feasibility criteria for each of the set of prioritized policy responses. Participants will rate the policy measures against the different feasibility criteria based on a 5-tier scale (from ‘very low’ to ‘very high’). Those measures with

a low feasibility rating (*less than 2.5 on a 1-5 scale*) against the specific feasibility criteria will be the subject of additional analysis in order to reveal eventual risks of implementation as well as mitigation strategies.

5.2.2 User acceptance

User acceptance includes different indications based on attitudes, believes and norms of individuals that are directly or indirectly affected by a proposed policy measure. More precisely, the user acceptance (social feasibility) relates to the question how will potential users act and react if a certain policy response is implemented. Following main indicators of user acceptance will be used for analysis (this list may be extended depending on the specific policy measure):

1. Personal and social aims;
2. Problem perception;
3. Information and knowledge about;
4. Perceived efficiency;
5. Satisfaction;
6. Usefulness;
7. Affordability.

Detailed explanation of the user acceptance criteria is given below.

1. ***Personal and social aims***. In general, a higher valuation of common social or personal aims will be positively related to acceptability. Users of the service who perceive a proposed policy measure as compliant to their own preferences will express a higher acceptability and acceptance rate.
2. ***Problem perception***. The extent to which a problem corresponding to a specific policy measure is a necessary indication in defining of user acceptance. In general, the high problem awareness will lead to an increased willingness to accept proposed policy measures for the perceived problems. More precisely, in order to assess the user acceptance from the perspective of "problem perception", the respondents will be asked to rank the importance of different factors (perceived as a consequence of non-applying a specific policy measure). It can be assumed that the higher a specific factor is ranked; the more users will perceive that factor as a problem in society and therefore the higher weight will be given to a corresponding policy measure.
3. ***Information and knowledge about***. The level of acceptance can depend on how well informed the potential users are about a specific urban mobility problem (corresponding to a specific policy measure) and about the new policy measure that can be introduced to reduce/eliminate the consequences of the problem. The better the people are informed the higher acceptance will be. During the questionnaire design, from the perspective of this dimension, the distinction will be made between whether a person feels well or poorly informed or whether he/she is actually well or badly informed. In other words, the difference between objective knowledge and the subjective assessment of the own knowledge must be made.
4. ***The perceived efficiency*** indicates the possible benefits potential users expect from a concrete policy measure as compared to other measures. More precisely, respondents will need to evaluate how they perceive different policy measures and how they evaluate a specific policy measure as compared to other alternative measures. The recognition of

corresponding problem and the information potential users have will influence the rate of efficiency. If the users note a specific policy measure as more efficient a higher support to that measure can be possible.

5. ***Satisfaction*** will result in a degree how the policy measure solves the users' needs. Satisfaction will be given by evaluation the policy measure as pleasant/unpleasant, irritating/likeable, undesirable/desirable.
6. ***Usefulness*** is related how the policy measure will support the users' objectives and their transport service use behavior. A potential user can find a specific policy measure effective but not for his own travelling needs. Usefulness is stated as the degree to which a person believes that implementing a specific policy measure will enhance his/her performance.
7. ***Affordability*** is related to socio-economic status of users. It may be assumed that the socio-economic status will affect the user acceptance of a specific policy measure. In cases of some policy measures it can be expected that low income groups should be more opposed to its acceptance. The willingness to pay will depend on income, and it can be assumed that higher willingness will imply a higher acceptance of some policy measures.

User acceptance of policy measures will be estimated based on the responses of experts which will rate each policy measure against each indicator of user acceptance by using the a 5-tier scale (from 'very low' to 'very high'). Those measures that have low user acceptance rate (*less than 2.5 on a 1-5 scale*) against the specific indicator will be the subject of additional analysis. Additional analysis will result in a strategy for improving the user acceptance of a specific policy measure against a "critical" user acceptance indicator.

5.3 Application to Valencia pilot: Use case 1

According to the methodology explained in chapter 5.2, the set of alternative policy measures was defined and the survey was designed (added as the Annex 3) to collect the opinions related to the most critical aspects of policy implementation feasibility and user acceptance.

5.3.1 Stakeholders involved and role

The relevant stakeholders participating in this use case are listed below. All have participated in the policy measure evaluation workshops although not all have the same relevance to each measure.

- Fundación Valenciaport
- Ferrocarrils de la Generalitat Valenciana (Metropolitan Metro Company, public transport operator)
- Metropolitan Mobility Authority (AMTV)
- Municipal Transport Authority (EMT)
- Torrent City Council
- Local bike association
- Mobility technological company
- Consultancy company

Table 4. Use case 1: Alternative policy measures (PM): stakeholders involved and role.

Alternative policy response	Stakeholders involved and role
PM1: Establishment of low emission zones	• Fundación Valenciaport: coordination and management of activities, workshops, validation of policies, elaboration of deliverables • Ferrocarrils de la Generalitat Valenciana (Metropolitan Metro Company, public transport operator): management of Cicloparcs, data provider, validation of policies • Valencia City Council in charge of public space, establishment of low emission zones, validation of policies • Local bike association, Cicloparcs' users, validation of policies
PM2: Building protected and well-maintained bike lanes	• Fundación Valenciaport: coordination and management of activities, workshops, validation of policies, elaboration of deliverables • Ferrocarrils de la Generalitat Valenciana (Metropolitan Metro Company, public transport operator), management of Cicloparcs, data provider, validation of policies • Metropolitan Mobility Authority (AMTV), validation of policies • Municipal Transport Authority (EMT), shared use of the roadway, validation of policies • Torrent City Council: responsible for the construction of the bike lanes, validation of policies, data provider • Valencia Coty Council: responsible for the construction of the bike lanes, validation of policies, data provider • Local bike association: Cicloparcs' users, validation of policies
PM3: Improvement of existing bike network by connecting with interurban bike lanes as well as with urban intermodal modes	• Fundación Valenciaport: coordination and management of activities, workshops, validation of policies, elaboration of deliverables • Ferrocarrils de la Generalitat Valenciana (Metropolitan Metro Company, public transport operator), management of Cicloparcs, data provider, validation of policies • Regional government: responsible for the construction of the bike lanes, validation of policies, data provider • Metropolitan Mobility Authority (AMTV), validation of policies • Municipal Transport Authority (EMT), shared use of the roadway, validation of policies • Torrent City Council: responsible for the construction of the bike lanes, validation of policies, data provider • Valencia Coty Council: responsible for the construction of the bike lanes, validation of policies, data provider • Local bike association: Cicloparcs' users, validation of policies
PM4: Sustainable public transport: subsidies and promotional campaigns	• Fundación Valenciaport: coordination and management of activities, workshops, validation of policies, elaboration of deliverables • Ferrocarrils de la Generalitat Valenciana (Metropolitan Metro Company, public transport operator): management of Cicloparcs, data provider, validation of policies • Metropolitan Mobility Authority on transport (AMTV): responsible for transport integration policies, data provider, validation of policies • Municipal Transport Authority (EMT): in charge of public bus transport in the metropolitan area of Valencia, data provider, validation of policies

5.3.2 Set of alternative policy responses and interrelationships

Table 5 shows the most preferred policy measures included in the feasibility assessment and the interrelationship with the mobility solution:

Table 5. Use case 1: T4.5 Alternative policy measures (PM) and interrelationships.

	PM1: Establishment of low emission zones	PM2: Building protected and well-maintained bike lanes	PM3: Improvement of existing bike network by connecting with interurban bike lanes as well as with urban intermodal modes	PM4: Sustainable public transport: subsidies and promotional campaigns
PM1: Establishment of low emission zones		In Valencia, the low-emission zones are in the old town, where most of them are narrow one-way streets. The cycling network consists of cycle streets or pedestrian streets where cyclists can cycle at low speeds (A).	The low-emission zone in Valencia has no intermodal node inside. Bicycles are allowed to circulate. Improving bike network contributes to mobility to and from the low emission zones	There is no relationship between the measures except that in the low emission zone CO2 emitting vehicles cannot be used and therefore public transport is favoured.
PM2: Building protected and well-maintained bike lanes	No matter which of the two measures is implemented first. The final effect is same than (A), although it is preferable to provide alternative modes of transport before prohibiting certain vehicles from circulating.		Improving the cycling network and its connection to inter-modal nodes is closely related. Both measures are highly complementary. (B)	Supply enhancement measures (PM2) are complemented by information and assistance measures aimed at increasing demand (PM4). (C)
PM3: Improvement of existing bike network by connecting with interurban bike lanes as well as with urban intermodal modes	Improving the cycling network (PM3) before implementing traffic restrictive measures (PM1) can improve the acceptance of these measures.	Same as (B). Highly complementary		Same as (C)
PM4: Sustainable public transport: subsidies and promotional campaigns	PM4 is needed for the acceptance of PM1 and for the disadvantaged citizens adversely affected by PM1	It's better to enhance offer (PM2) before adopting measures focused on increasing demand (PM4) (D)	Same as (D)	

5.3.3 Implementation feasibility

The survey' questions (six in total) aim to evaluate the selected alternative measures against the most critical dimensions of feasibility – technical, financial, political and administrative feasibility as it has already explained in the Methodology section. The survey was circulated via Qualtrics platform among the stakeholders relevant for implementation of the use case 1 in Valencia pilot.

In total 11 respondents participated in the Feasibility Survey. The structure of the respondents as well as their share is illustrated on Figure 26.

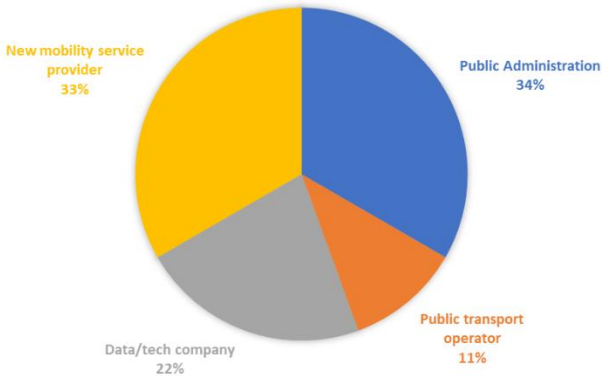


Figure 26. Use case 1 -Feasibility study: The structure and share of respondents.

The responses were analysed and used to identify the relevant questions related to potential policy measures (PMs) infeasibility (identification, analysis, how mitigating the risk). Then, these questions were the object of discussion in the second round of feasibility assessment.

Column three in Table 7 contains the relevant questions for PM implementation, risk identification, analysis and mitigation in Valencia Pilot. Column four includes a summary of the responses collected during the workshop. Annex 3 includes complete responses.

The workshop was organized on December 9. It was attended by the main stakeholders of the Valencia's Pilot, a total of 8 people. A working document was provided to the participants in advance to facilitate the discussion.

Table 6. T4.5 Use case 1: Workshop attendees

NAME	COMPANY
Marcos Roselló	FGV – metro company
Luis Roda	EMT – public transport company
Ángel Navarro	LAS NAVES
Antonio Sanz	VALENCIA CITY COUNCIL
Juan Bueno	MOVUS – Consultancy company
Gregorio Haro	ATMV – Metropolitan Mobility Authority
Carolina Navarro	FUNDACIÓN VALENCIAPORT
Noemí Monterde	FUNDACIÓN VALENCIAPORT

Table 7. T4.5 Use case 1: Implementation feasibility - Second stage: Responses to misalignments.

Policy measure	Dimension Criteria	Questions for PM implementation risk identification, analysis and mitigation	Workshop responses
PM1: Establishment of low emission zones	Technical feasibility	Why is PM1 technically unfeasible?	This measure is not related to installing Cicloparcs at origin stations in the metropolitan area (outside the city)
		How to overcome the gap?	There is no room for improvement. It would make sense to put bicycles and electric scooters parkings at nodes of passenger attraction (universities, hospitals, large workplaces or shopping centres), but it is not Metrovalencia's responsibility.
	Indirect benefits	What are the reasons for low indirect benefits?	No users benefit from the combination of the two measures
		Measures for increasing indirect benefits	• Integrated titles for urban and interurban transport and the use of Cicloparcs • Expanded network of Cicloparcs • Add service for private scooters • Include public shared mobility services in the same transport ticket (such as Valenbisi or public scooters).
PM2: Building protected and well-maintained bike lanes	Financial feasibility/indirect and fixed costs	What are the direct, indirect and fixed costs?	Construction costs (not expensive)
		Will these costs be outbalanced by the benefits	Yes: cost reduction on congestion, noise, contribution to GHG emissions
	Financial feasibility/operations and maintenance costs	What are the real operations and maintenance costs	• Low, road signs, painting • slight increase in the accident rate
		Which party will be responsible for operations and maintenance costs	City councils or regional government depending on the bike line
		How this cost burden can be reduced	• dissemination of the Cicloparc service to metro users • It is not a concern on the part of the responsible authorities.

Policy measure	Dimension Criteria	Questions for PM implementation risk identification, analysis and mitigation	Workshop responses
		Will these costs be outbalanced by the benefits	Yes: cost reduction on congestion, noise, contribution to GHG emissions
	Political feasibility	What are the reasons for unacceptability?	• There is high acceptability and high political support to this measure • lack of bike lane capacity, bike and scooter congestion • lack of connectivity
		Measures for overcoming/reducing the acceptability barriers	• improved regulation • improvement of road safety education • improvement in citizens' knowledge of the regulations
	Administrative feasibility/administrative capability	Does the public authority have the resources to implement the PM2?	Yes; it is a high priority
		Does the public body have the authority to implement the PM2?	Yes
		To what extent the PM2 has the commitment of different DM levels	• It is needed improvement of coordination between public administrations and between departments of the same administration. • Publication of the Metropolitan Mobility Plan and the plan's implementing regulations.
PM3: Improvement of existing bike network by connecting with interurban bike lanes as well as with urban intermodal modes	Financial feasibility/indirect and fixed costs	What are the direct, indirect and fixed costs?	Construction costs (more expensive than PM2)
		Will these costs be outbalanced by the benefits	Yes: cost reduction on congestion, noise, contribution to GHG emissions
	Financial feasibility/operations and maintenance costs	What are the real operations and maintenance costs	• Low, road signs, painting • slight increase in the accident rate
		Which party will be responsible for operations and maintenance costs	City councils or regional government depending on the bike line

Policy measure	Dimension Criteria	Questions for PM implementation risk identification, analysis and mitigation	Workshop responses
		How this cost burden can be reduced	• improvement of public bidding processes although they are quite optimized.
		Will these costs be outbalanced by the benefits	Yes: cost reduction on congestion, noise, contribution to GHG emissions
	Political feasibility	What are the reasons for unacceptability?	• There is high acceptability and high political support to this measure • lack of bike lane capacity • lack of connectivity • lack of security for bike users and pedestrians
		Measures for overcoming/reducing the acceptability barriers	• improved regulation • improvement of road safety education • improvement in citizens' knowledge of the regulations • improvement of the connection of Valencia's urban bicycle lanes with the metropolitan area. • park-and-ride facilities at the point of origin • improving the meshing of the cycling network • improvement in the application of punitive measures
	Administrative feasibility/administrative capability	Does the public authority have the resources to implement the PM3?	Yes; it is a high priority
		Does the public body have the authority to implement the PM3?	Yes
		To what extent the PM3 has the commitment of different DM levels	• It is needed improvement of coordination between public administrations and between departments of the same administration. • Publication of the Metropolitan Mobility Plan and the plan's implementing regulations.
PM4: Sustainable public transport: subsidies and	Political feasibility/New mobility service providers	What are the reasons for unacceptability?	• Lack of internal institutional support • failure of channel design to convey information to potential users
		Measures for overcoming/reducing the acceptability barriers	There is a clear need to improve information to users and to all citizens

Policy measure	Dimension Criteria	Questions for PM implementation risk identification, analysis and mitigation	Workshop responses
promotional campaigns			

5.3.4 User acceptance

Figure 27 shows the structure and share of respondents of the user acceptance tests for the use case 1 in the city of Valencia. There were 17 participants. As we observe, the users of the Cicloparc are the most predominant respondents of the survey.

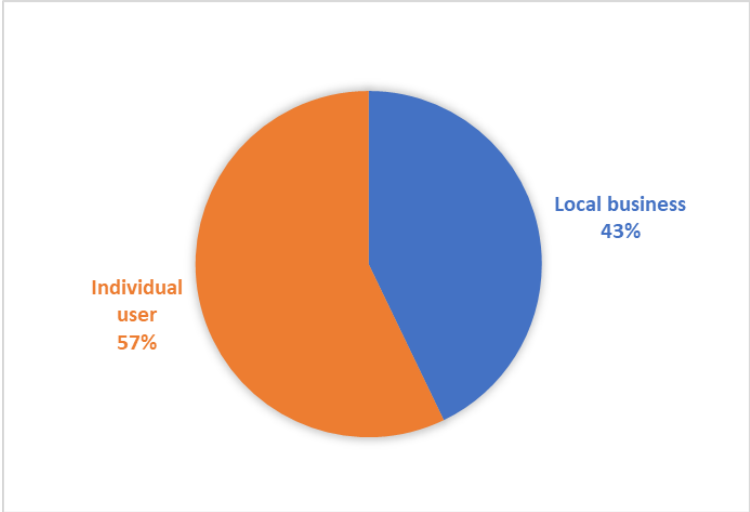


Figure 27. User acceptance study - Valencia Pilot, Use Case 1: The structure and share of respondents

According to the results, participants have a good perception and awareness of urban mobility challenges (air pollution, congestion, safety and efficiency of the last mile distribution). About the alternative policy measures proposed for supporting Cicloparcs in metro stations, they agree with considering that they meet their needs and understand how they can solve the urban mobility challenges. Finally, participants believe the proposed policy measures are acceptable and affordable.

5.3.5 City-led policy response

For the stakeholders, PM1, “Establishment of low emission zone”, is neither technically feasible nor provides users of Cicloparc with any indirect benefits as they believe there is no relationship between them.

About PM2, “Building protected and well-maintained bike lanes” although the cost is high, the indirect benefits make it a priority for public agents who may not agree on the provision of this measure. Therefore, Valencia may need to improve the coordination between the different departments and the Publication of the Metropolitan Mobility Plan and the plan's implementing regulation.

PM3, “Improvement of existing bike network by connecting with interurban bike lanes as well as with urban intermodal modes”, is similar to PM2 and received similar punctuation and responses that PM2. The main differences are that this measure is assessed as more expensive, and to raise safety there is a greater need to increase citizens' knowledge and awareness and improve the application of punitive measures.

PM4, “Sustainable public transport: subsidies and promotional campaigns”, can be considered as the most supportive measure to enhance the adoption of the Cicloparc. The stakeholders participating in the pilot deemed that “There is a clear need to improve information to users and all citizens”, and it requires more internal institutional support to convey information to potential users.

To conclude, PM4 with more support from institutional bodies may help to spread the word out and increase the number of commuters that leave the car in favour of the combination of micomobility and public transport options. However, to make the Cicloparc scalable and sustainable, the public authorities require more collaboration and coordination between the different public departments to turn PM2 and PM3 priorities into reality.

5.4 Application to Valencia pilot: Use case 2

According to the methodology explained in chapter 5.2, the set of alternative policy measures was defined and the survey was designed (added as the Annex 3) to collect the opinions related to the most critical aspects of policy implementation feasibility and user acceptance.

5.4.1 Stakeholders involved and role

The relevant stakeholders participating in this use case are listed below. All have participated in the policy measure evaluation workshops although not all have the same relevance to each measure.

- Fundación Valenciaport
- Ferrocarrils de la Generalitat Valenciana (Metropolitan Metro Company, public transport operator)
- Metropolitan Mobility Authority (AMTV)
- Municipal Transport Authority (EMT)
- Citypaq – Correos (logistic company)
- Mobility technological company
- Consultancy company

Table 8. Use case 2: Alternative policy measures (PM): stakeholders involved and role.

Alternative policy response	Stakeholders involved and role
PM1: Provision of mobility hubs to enhance connectivity and multimodality	• Fundación Valenciaport: coordination and management of activities, workshops, validation of policies, elaboration of deliverables • Ferrocarrils de la Generalitat Valenciana (Metropolitan Metro Company, public transport operator), management of Cicloparcs, data provider, validation of policies • Metropolitan Mobility Authority (AMTV), validation of policies • Municipal Transport Authority (EMT), shared use of the roadway, validation of policies • Valencia Coty Council: responsible for the construction of the bike lanes, validation of policies, data provider • Consultancy company on transport: background, validation of policies
PM2: Establishing loading and unloading zones as close as possible to intermodal hubs	• Fundación Valenciaport: coordination and management of activities, workshops, validation of policies, elaboration of deliverables • Metropolitan Mobility Authority (AMTV), validation of policies

Alternative policy response	Stakeholders involved and role
	• Valencia Coty Council: responsible for the construction of the bike lanes, validation of policies, data provider • Consultancy company on transport: background, validation of policies
PM3: Legal mechanism to include clauses on data sharing privacy policies	• Fundación Valenciaport: coordination and management of activities, workshops, validation of policies, elaboration of deliverables • Ferrocarrils de la Generalitat Valenciana (Metropolitan Metro Company, public transport operator), management of Cicloparcs, data provider, validation of policies • Metropolitan Mobility Authority (AMTV), validation of policies • Municipal Transport Authority (EMT), shared use of the roadway, validation of policies • Valencia Coty Council: responsible for the construction of the bike lanes, validation of policies, data provider • Consultancy company on transport: background, validation of policies
PM4: Establishing public-private collaboration mechanisms to facilitate the adoption of measures to improve sustainability in cities	• Fundación Valenciaport: coordination and management of activities, workshops, validation of policies, elaboration of deliverables • Ferrocarrils de la Generalitat Valenciana (Metropolitan Metro Company, public transport operator), management of Cicloparcs, data provider, validation of policies • Metropolitan Mobility Authority (AMTV), validation of policies • Valencia Coty Council: responsible for the construction of the bike lanes, validation of policies, data provider • Consultancy company on transport: background, validation of policies

5.4.2 Set of alternative policy responses and interrelationships

Table 9 shows the most preferred policy measures included in the feasibility assessment and the interrelationship with the mobility solution:

Table 9. Use case 2: T4.5 Alternative policy measures (PM) and interrelationships

	PM1: Provision of mobility hubs to enhance connectivity and multimodality	PM2: Establishing loading and unloading zones as close as possible to intermodal hubs	PM3: Legal mechanism to include clauses on data sharing privacy policies	PM4: Establishing public-private collaboration mechanisms to facilitate the adoption of measures to improve sustainability in cities
PM1: Provision of mobility hubs to enhance connectivity and multimodality		They are complementary measures. It is considered a good idea to define loading and unloading zones (PM2) where there are intermodal hubs (PM1) to facilitate the supply of goods and services to these hubs. (A)	Independent measures.	Independent measures.
PM2: Establishing loading and unloading zones as close as possible to intermodal hubs	Same as (A)		Independent measures.	Independent measures.
PM3: Legal mechanism to include clauses on data sharing privacy policies	Independent measures.	Independent measures.		Independent measures.
PM4: Establishing public-private collaboration mechanisms to facilitate the adoption of measures to improve sustainability in cities	Independent measures.	Independent measures.	Independent measures.	

5.4.3 Implementation feasibility

The survey' questions (six in total) aim to evaluate the selected alternative measures against the most critical dimensions of feasibility – technical, financial, political and administrative feasibility as it has already explained in the Methodology section. The survey was circulated via Qualtrics platform among the stakeholders relevant for implementation of the use case 2 in Valencia pilot.

In total 9 respondents participated in the Feasibility Survey. The structure of the respondents as well as their share is illustrated on Figure **28**.

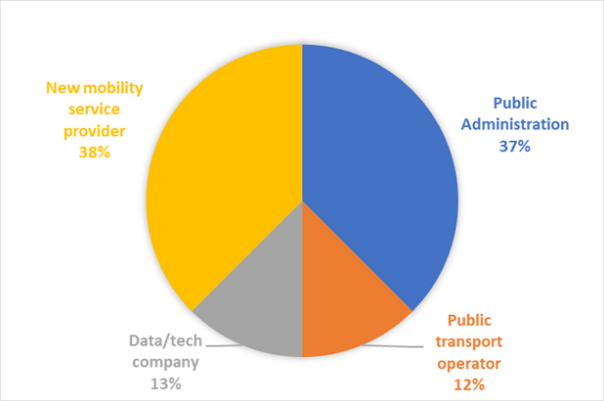


Figure 28. Use case 2 -Feasibility study: The structure and share of respondents

The responses were analysed and used to identify the relevant questions related to potential policy measures (PMs) infeasibility (identification, analysis, how mitigating the risk). Then, these questions were the object of discussion in the second round of feasibility assessment.

Column three in Table 11 contains the relevant questions for PM implementation, risk identification, analysis and mitigation in Valencia Pilot. Column four includes a summary of the responses collected during the workshop. Annex 3 includes complete responses.

The workshop was organized on December 9. It was attended by the main stakeholders of the Valencia's Pilot, a total of 8 people. A working document was provided to the participants in advance to facilitate the discussion. Citypaq, that has provided data, its previous experience and has participated in the process of validation policies but in bilateral meetings with Fundación Valenciaport, not in the workshop.

Table 10. T4.5 Use case 2: Workshop attendees

NAME	COMPANY
Marcos Roselló	FGV – metro company
Luis Roda	EMT – public transport company
Ángel Navarro	LAS NAVES
Antonio Sanz	VALENCIA CITY COUNCIL
Juan Bueno	MOVUS – Consultancy company
Gregorio Haro	ATMV – Metropolitan Mobility Authority
Mmiriam Cabrero	CITYPAQ-CORREOS - Logistic company
Carolina Navarro	FUNDACIÓN VALENCIAPORT
Noemí Monterde	FUNDACIÓN VALENCIAPORT

Figure 29.Use case 2: Final workshop attendees

Table 11. T4.5. Use case 2: Implementation feasibility - Second stage: Responses to misalignments

Policy measure	Dimension Criteria	Questions for PM implementation risk identification, analysis and mitigation	Workshop responses
PM1: Provision of mobility hubs to enhance connectivity and multimodality	Financial feasibility/indirect and fixed costs	What are the direct, indirect and fixed costs?	• cost of accesses and interchange stations • cost of land occupation
		Will these costs be outbalanced by the benefits	High costs. For freight, it is better to locate them outside the city and avoid heavy vehicle traffic in the city. For passengers, it is necessary to locate them in the outskirts as dissuasive modal interchange centers, and in the city for the meshing of the network, complementing the different modes.
	Financial feasibility/operations and maintenance costs	What are the real operations and maintenance costs	It depends on the type of hub
		Which party will be responsible for operations and maintenance costs	The companies in charge of each one of the connected modes
		How this cost burden can be reduced	• Good planning • Improvement of concession contracts • improvement of public bidding processes although they are quite optimized.
		Will these costs be outbalanced by the benefits	yes, when external costs such as congestion, emissions, noise, etc., are internalized (Where measures are implemented to ensure that all users pay for the external costs associated with their mode of transport of choice).
PM2: Establishing loading and unloading zones as close as possible to intermodal hubs	Financial feasibility/indirect and fixed costs	What are the direct, indirect and fixed costs?	• Road markings and painting
		Will these costs be outbalanced by the benefits	The costs are very low and the measure is better than allowing disorganized stopping of vehicles for loading and unloading on corners, double lines, sidewalks, etc.
	Financial feasibility/operations and maintenance costs	What are the real operations and maintenance costs	• Maintenance costs are almost zero.
		Which party will be responsible for operations and maintenance costs	City council

Policy measure	Dimension Criteria	Questions for PM implementation risk identification, analysis and mitigation	Workshop responses
		How this cost burden can be reduced	It is not a concern
		Will these costs be outbalanced by the benefits	Yes
PM3: Legal mechanism to include clauses on data sharing privacy policies	Financial feasibility/indirect and fixed costs	What are the direct, indirect and fixed costs?	• Software development • Hardware (or cloud space) for data collection
		Will these costs be outbalanced by the benefits	Yes. User confidence is improved if confidentiality is well protected and in accordance with data protection law.
	Financial feasibility/operations and maintenance costs	What are the real operations and maintenance costs	Software maintenance
		Which party will be responsible for operations and maintenance costs	The company responsible of collecting data
		How this cost burden can be reduced	
		Will these costs be outbalanced by the benefits	
PM4: Establishing public-private collaboration mechanisms to facilitate the adoption of measures	Financial feasibility/indirect and fixed costs	What are the direct, indirect and fixed costs?	none
		Will these costs be outbalanced by the benefits	
	Financial feasibility/operations and maintenance costs	What are the real operations and maintenance costs	In each case, contracts must be adapted to provide for cost reductions for the private company in case the measure to be implemented results in an improvement of mobility sustainability.

Policy measure	Dimension Criteria	Questions for PM implementation risk identification, analysis and mitigation	Workshop responses
to improve sustainability in cities		Which party will be responsible for operations and maintenance costs	The leadership of this measure corresponds to public administration. Both, public and private companies are responsible for the costs
		How this cost burden can be reduced	• using reduction of taxes, fees, subsidies, grants, etc. • reducing the bureaucratic burden • reducing time to implement measures
		Will these costs be outbalanced by the benefits	This can attract private companies by improving their profit margin, or by reducing the implementation time of the measure.

5.4.4 User acceptance

Figure 30 shows the structure and share of respondents of the user acceptance tests for the use case 2 in the city of Valencia. There were 14 participants. As we observe, the users of the lockers are the most predominant respondents of the survey.

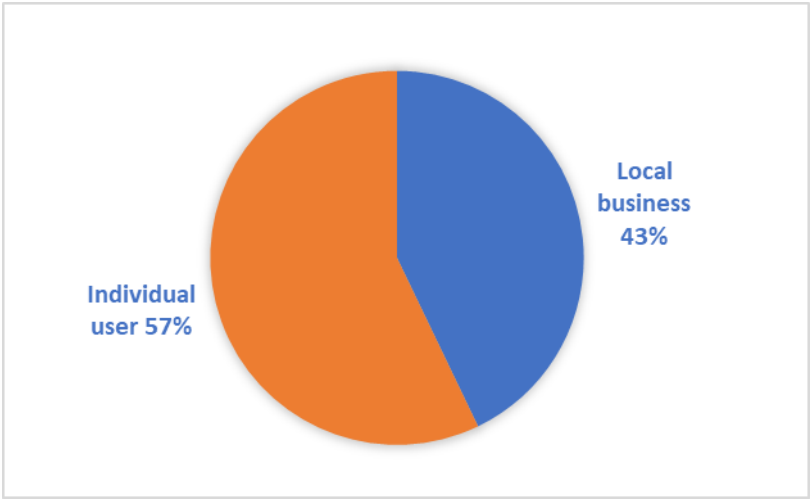


Figure 30. Use Case 2: User acceptance study - Valencia Pilot: The structure and share of respondents

According to the results and as in use case 1, participants have a good perception and awareness of urban mobility challenges (air pollution, congestion, safety and efficiency of the last mile distribution). Participants believe the proposed policy measures for supporting the parcel lockers in metro stations are acceptable, affordable and agree with considering that they meet their needs. However, they do not fully understand how PM3 and PM4 can solve the urban mobility challenges. Therefore, these two policy measures were further analysed during the workshop.

From the user's point of view, the e-lockers solution made more sense at the beginning of the project than it does today. Covid-19 on the one hand boosted e-commerce and on the other hand, given the difficulty many shoppers had in getting their packages delivered, it has boosted delivery points in locations such as stationery stores, kiosks, gas stations, etc. even to friendly neighbours without too much identification. The use of Citypaq is less agile than any of the above mentioned options.

Table 12. T4.5. Use case 2:- User acceptance - Second stage: Responses to misalignments

Policy measure	Dimension Criteria	Questions for PM implementation risk identification, analysis and mitigation	Response
PM3: Legal mechanism to include clauses on data sharing privacy policies	Knowledge of specific policy measures aimed at solving problems in their environment	How users can be better informed about the effects of PM3 implementation?	• Information campaigns • User app
PM4: Establishing public-private collaboration mechanisms to facilitate the adoption of measures to improve sustainability in cities	Knowledge of specific policy measures aimed at solving problems in their environment	How users can be better informed about the effects of PM4 implementation?	• The measure affects the companies providing sustainable mobility services, not the end users. These benefit from access to more services, new services and lower costs. • Citizen information campaigns can be carried out

5.5 City-led policy response

For the stakeholders, PM1, “Provision of mobility hubs to enhance connectivity and multimodality” is not financially feasible but the benefits balance the costs. Some mitigation measures to make this measure more affordable are to define good planning, the improvement of concession contracts.

About PM2, “Establishing loading and unloading zones as close as possible to the intermodal hub”, although the survey responders considered that is not financially sustainable, the workshop participants agreed with evaluating the costs are very low, and the measure is better than allowing disorganized stopping of vehicles for loading and unloading on corners, double lines, sidewalks, etc.

PM3, “Legal mechanism to include clauses on data sharing privacy policies” was assessed as financially unfeasible. The costs are for developing the cloud infrastructure, required software and maintenance operations. However, user confidence is improved if confidentiality is well protected and by data protection law.

PM4, “Establishing public-private collaboration mechanisms to facilitate the adoption of measures to improve sustainability in cities”. This measure of operational costs is related to the need of creating tailored contracts for both parties. Potential mitigation strategies are protocols to make the implementation more agile. This may attract private companies by improving their profit margin, or by reducing the implementation time of the measure.

Both PM3 and PM4 require increasing the knowledge gaps for understanding how these measures may positively impact reducing the administrative hurdles through information campaigns.

To conclude, all PMs can enhance the adoption of the mobility solution. The minor costs are balanced by the benefits of implementing these measures. PM3 and PM4 will make the implementation process more agile and shorten testing times, while PM1 and PM2 may increase the adoption and good practices once the mobility solution is running About PM3 and PM4, more information campaigns may increase the final users’ awareness of the bureaucratic hurdles and data privacy issues.

6 Summary and outlook

As detailed on this report, the solution proposed for Valencia consisted on the development of an *"Intermodal urban passenger/freight node for collective public & private transport".*

This solution is fully aligned with the current policies of Valencia City Council and the regional government (Generalitat Valenciana) in terms of encouraging the use of bicycles, public transport and intermodality between them as an alternative to private vehicles. On one hand, the SUMP of the city of Valencia is promoting a change in citizens' mobility behavior, focusing on mobility policies towards more environmentally friendly modes of transport, in this sense, efforts are being paying to developing a cycle ring in the city centre promoting the use of the bicycles. On the other hand, the Regional Government, on the Basic Mobility Plan for the Metropolitan Area of Valencia has defined the "Intermodality as a priority in metropolitan mobility". Therefore, the SPROUT pilot is one of the most important demonstration on how to coordinate Regional and Local Authorities to reply to both Mobility Strategies thanks to the cooperation of Public Authorities. As explained during this report, FGV (Public company depending on the Regional Government) has led the implementation of two cases studies with the support of local public entities (such as the Municipality) but also thanks to the involvement of private companies (such as technological or logistic operators).

The Intermodal urban passenger/freight node for collective public & private transport" includes two case studies: 1) private bicycle parking system that was installed in two metro stations in the metropolitan area of Valencia and 2) installation of e-lockers in some two metro stations at the city centre.

After the pilot test of this case study, the following main results were obtained:

- Average daily usage 4 users (compared to 16 available places).
- The metro+bike intermodality ratio increased by 6% (I410).
- CO_2 emissions were reduced by 0.7% and it is estimated that when the solution penetrates the market and matures, an average of 12 daily users can be reached and emissions are reduced by 2.8% (I404).
- During the pilot test, 261 parcels were sent to the two installed e-lockers, saving 165 kg of CO_2 emissions and with an annual potential to save around 4 tonnes of CO_2 per year.

As regards of the city-specific policies for harnessing the impact of new mobility solutions., following to the analysis performed following the SPROUT proposed methodology, after the analysis of policy measures by selected stakeholders, sustainable public transport: subsidies and promotional campaigns can be considered as the most supportive measure to enhance the adoption of the Cicloparc. While for Citypaq, the "Establishing public-private collaboration mechanisms to facilitate the adoption of measures to improve sustainability in cities" is one of the potential measures that could foster the agile implementation of this solution.

The stakeholders participating in the pilot deemed that “There is a clear need to improve information to users and all citizens”, and it requires more internal institutional support to convey information to potential users.
Thanks to SPROUT, Valencia has demonstrated the need for cooperation between different public bodies and the need of the financial support of public policies to be able to implement this solution that will be not possible to be affordable without the support of the public sector. the need of public financing.
As a result of the replicability of the pilot, the implementation of the Cicloparc solution in additional metro stations not only on the city of Valencia but also on other locations on the Valencia Region (specifically on Alicante city) has demonstrated its high potential to be replicated on several environments.

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Annex 1: Location selection process for use cases

As explained in deliverable 'SPROUT D4.2 Set-up Report Valencia', for the selection of the location of the use cases three tools were used to identify the metro stations for the Use Cases 1 and 2:

- Passenger flow data to identify the busiest stations (in the metropolitan area for UC1 and in the city for UC2).
- field survey to check the space available on the surface for UC1 and in the station hall for UC2, as well as the security of the installation (existence of surveillance cameras in the vicinity for UC1).
- on-line questionnaires for users on location preference for both UCs

The process is described below (for more information, see '*SPROUT D4.2 Set-up Report Valencia*').

Valencia is the third largest city in Spain after Madrid and Barcelona with a population of nearly 800000 within its boundaries and more than 1,500,000 considering its metropolitan area.

València			**L'Horta Sud**			**L'Horta Nord**			**L'Horta Nord (cont.)**		
250	València	798.538	007	Albal	16.270	009	Albalat dels Sorells	3.944	166	Meliana	10.662
L'Horta Oest			015	Alcàsser	9.908	013	Alboraya	24.222	171	Moncada	21.802
190	Paterna	69.156	022	Alfafar	20.763	014	Albuixech	3.983	177	Museros	6.291
005	Alaquàs	29.341	054	Benetússer	14.668	025	Alfara del Patriarca	3.314	199	Pobla de Farnals (la)	7.840
021	Aldaia	31.492	065	Beniparrell	1.931	032	Almàssera	7.295	205	Puçol	19.455
159	Manises	30.693	094	Catarroja	27.827	074	Bonrepòs i Mirambell	3.645	204	Puig	8.566
169	Mislata	43.278	152	Llocnou de la Corona	118	078	Burjassot	37.584	207	Rafelbuñol/Rafelbunyol	8.929
193	Picanya	11.409	165	Massanassa	9.538	117	Emperador	692	216	Rocafort	7.160
102	Quart de Poblet	24.536	186	Paiporta	25.309	126	Foios	7.342	237	Tavernes Blanques	9.117
244	Torrent	81.245	194	Picassent	20.709	135	Godella	13.058	260	Vinalesa	3.380
110	Xirivella	29.108	223	Sedaví	10.245	163	Massalfassar	2.480			
			230	Silla	18.467	164	Massamagrell	15.752			
										Total Àrea Metropolitana València	**1.559.908**

Font: Explotació Estadística del Padró 2018 (www.ine.es). Per a la ciutat de València, població al Padró Municipal d'Habitants a 1 de gener de 2018.

Table 13: Inhabitants in Valencia Metropolitan Area (Source: City Council of Valencia)

Figure 31 shows the location and population of towns and cities of Valencia metropolitan area:

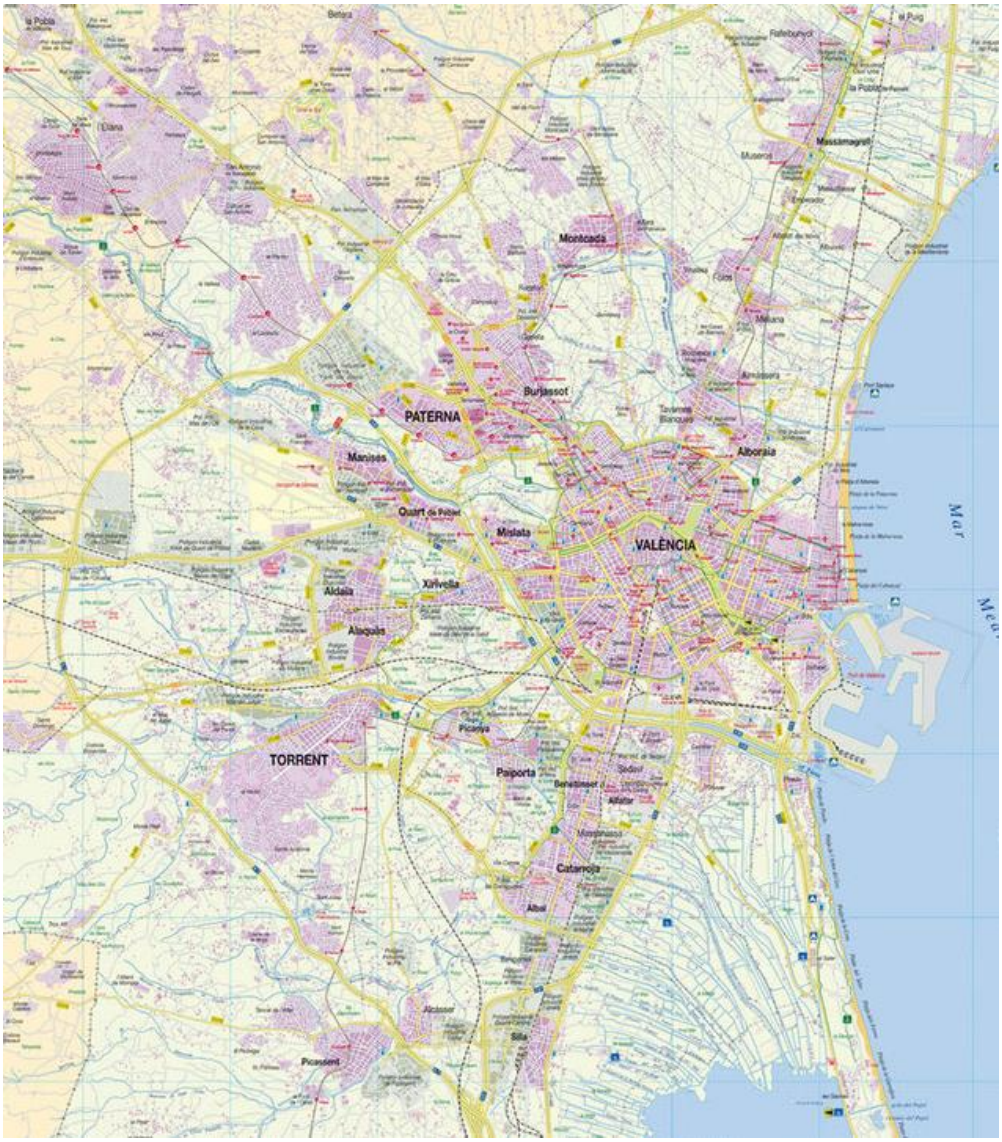


Figure 31: Metropolitan area of Valencia (Source: City Council of Valencia)

With regard to the public transport on offer in the city of Valencia, there is a wide range of services, such as bus, metro and tram. In addition, these services are complemented by a public bicycle rental service.

Regarding to the Valencia metro network, it has nine lines and a total of 156,388 km of rail network. In 2018, the demand for passengers exceeded 67 million.

Figure 32: Metro map of Valencia Area (Source: *Ferrocarrils de la Generalitat Valenciana*).

As for the cycling network, there are actions at different levels, not always as coordinated as would be desirable. Thus we have the ring developed by the regional government (Figure 33), the cycling network of the city of Valencia (Figure 34), bicycle lanes on some stretches of roads of different jurisdictions and bicycle lanes in other municipalities of the metropolitan area that make up an extensive cycling network (Figure 35).

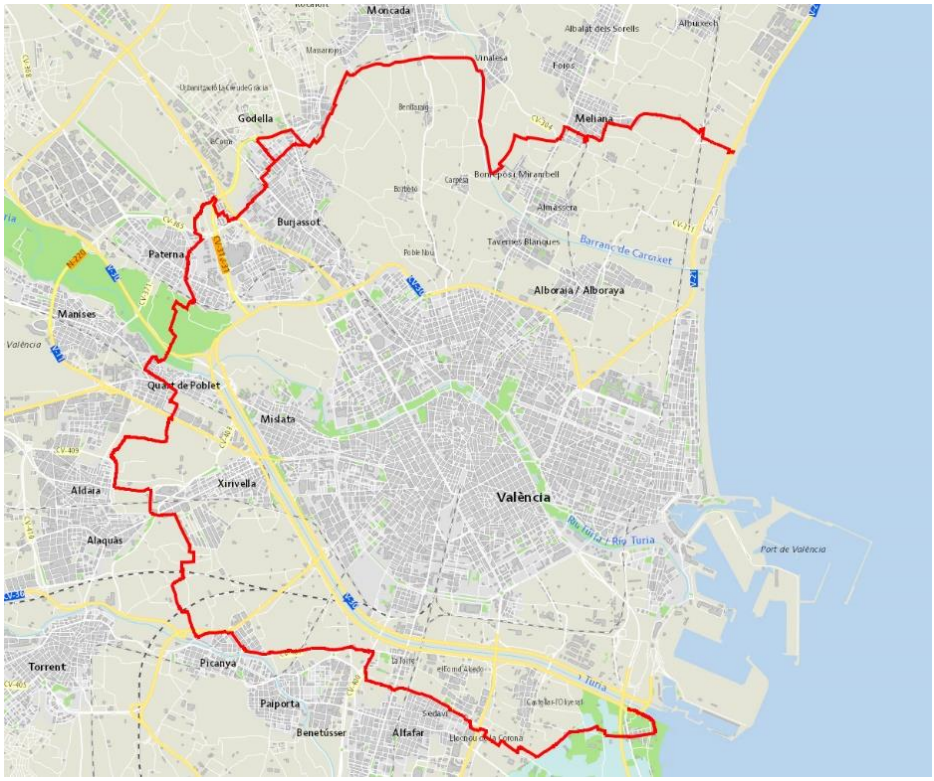


Figure 33: Metropolitan Green Ring bikelane (Source: Generalitat Valenciana)

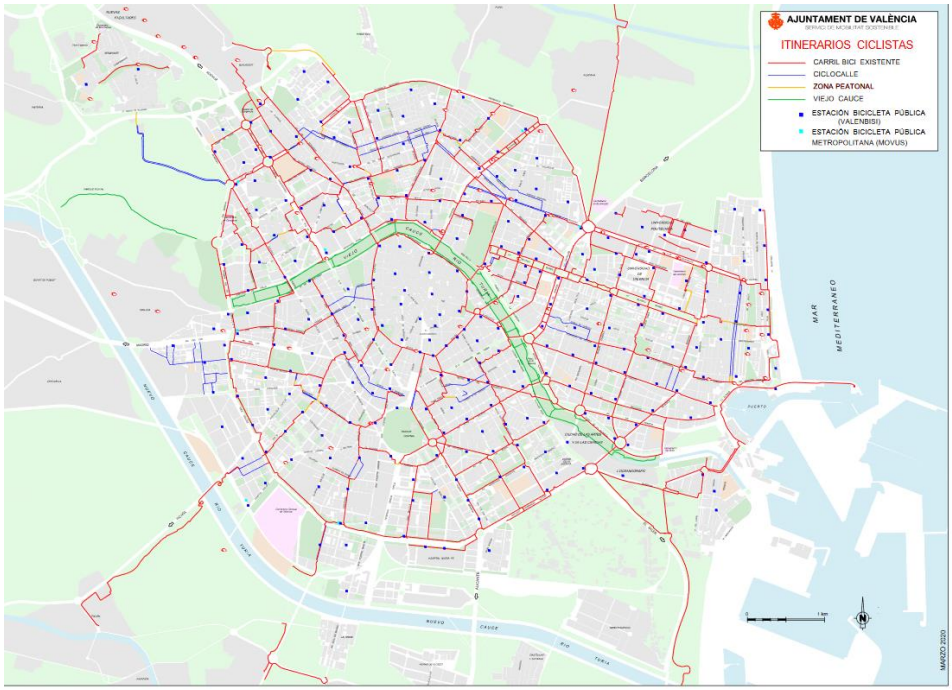


Figure 34: Bike infrastructures of Valencia (Source: City Council of Valencia)

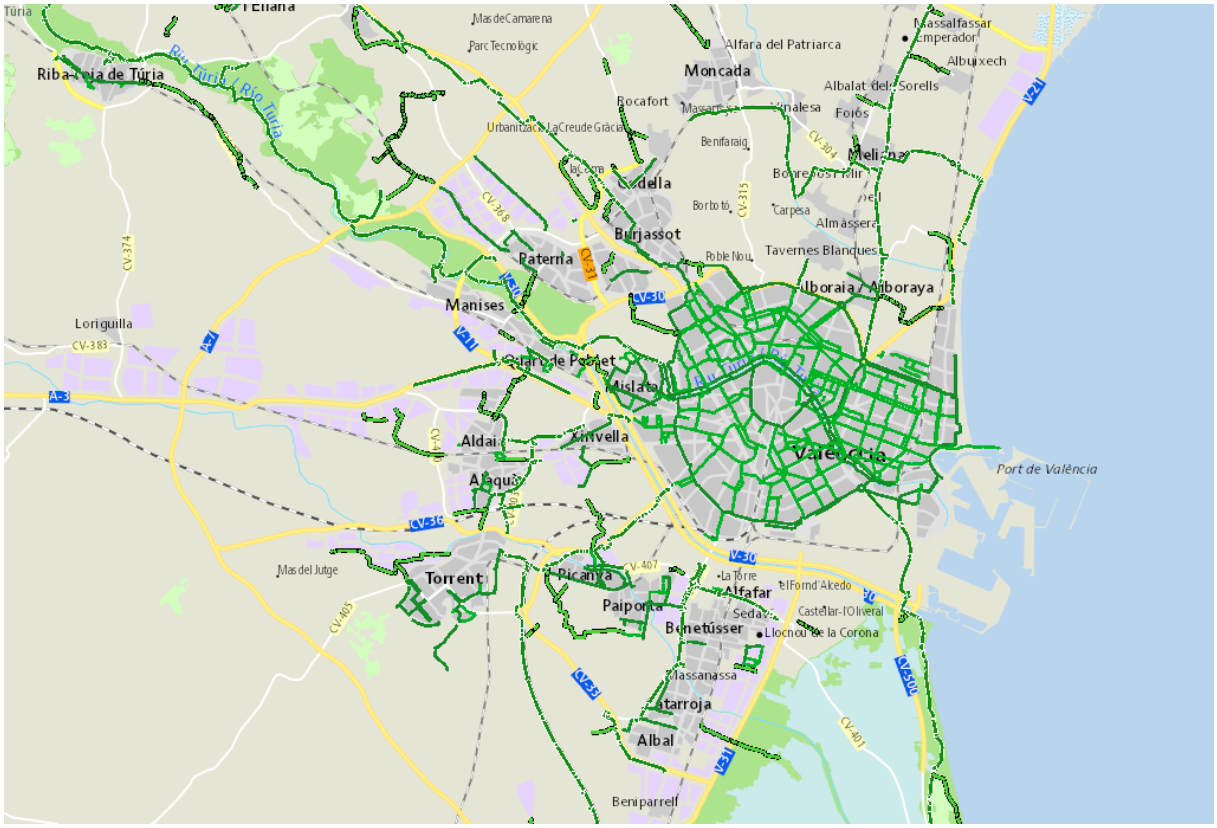


Figure 35: Bike infrastructures of Valencia metropolitan area (Source: Generalitat Valenciana)

The selection of metro stations was the first step of both Use Cases. In order to select the most suitable metro stations for the pilot implementation, several analyses were performed:

4. **Passenger flow**: the passenger annual flows were studied in order to select the most crowded nodes in the metropolitan area of Valencia for the Cicloparcs and at the city of Valencia for e-lockers.

Ranking 2019	Ranking 2018	Stations	Total 2018	% 2018	Total 2019	% 2019
1º	1º	**XÀTIVA**	**5.305.174**	**7,89%**	**5.459.784**	**7,862%**
2º	2º	**COLÓN**	**4.576.210**	**6,80%**	**4.520.931**	**6,510%**
3º	3º	À. GUIMERÀ	2.872.207	4,27%	3.067.957	4,418%
4º	4º	BENIMACLET	2.282.972	3,39%	2.363.670	3,404%
5º	5º	TÚRIA	2.088.872	3,11%	2.044.393	2,944%
6º	6º	PL. ESPANYA	1.970.440	2,93%	2.035.060	2,931%
7º	7º	FACULTATS	1.926.036	2,86%	1.951.546	2,810%
8º	8º	AMISTAT	1.788.694	2,66%	1.817.120	2,617%
9º	9º	MISLATA	1.689.548	2,51%	1.708.658	2,461%
10º	11º	AV. DEL CID	1.537.551	2,29%	1.598.112	2,301%
11º	**10º**	**TORRENT-AVINGUDA**	**1.574.934**	**2,34%**	**1.579.610**	**2,275%**
26º	**25º**	**EMPALME**	**775.448**	**1,15%**	**800.390**	**1,153%**
		TOTAL passengers flows	**67.269.102**		**69.442.539**	

Table 14: Metro Passangers Flows (Source: Ferrocarrils de la Generalitat Valenciana)

5. **Field-study:** In order to analyse the station that meet the requirement for the pilot implementation, a field visit was performed in order to assess the following aspects:
   - Availability of space to locate the bike parking and the e-lockers.
   - Security of the station: to analyse whether the available spaces are within the reach of existing surveillance systems.
6. **On-line questionnaires:** in order to consider the opinion of the potential users about the location of the new facilities.

Finally, the three key factors in the decision-making process were:

d) space available to install the parking facilities in the immediate vicinity of the subway entrance (Use Case 1) and to install the e-lockers in the inner hall of the metro stations (Use Case 2).
e) the users' preferences expressed in the questionnaires.
f) and the security provision (FGV camera surveillance).

During the field visit two stations where selected as both have enough space to install the parking facilities: **Torrent Avinguda** and **Empalme.** In addition, as result of the questionnaires both stations where on the top five list of the users' preferences. The selection was the results of analysing passengers' flows (the aim was select the most crowded nodes), a field study (to analyse the stations regarding to availability of space, security, links) and on-line questionnaires to metro users

Empalme station is an interchange station for Metrovalencia Lines 1, 2 and 4. It is located in the municipality of Burjassot (more than 37,500 inhabitants), next to Valencia. It is also located near the CV-35 highway that connects Valencia with Ademuz. The station has 4 tracks for stopping trains that provide passenger service, as well as one track for the tram section and another that acts as a loop for changes of direction.

Torrent Avinguda station is an interchange station for Metrovalencia Lines 2 and 7. It is located in Avenida El Vedat, in the municipality of Torrent with more than 80,000 inhabitants.

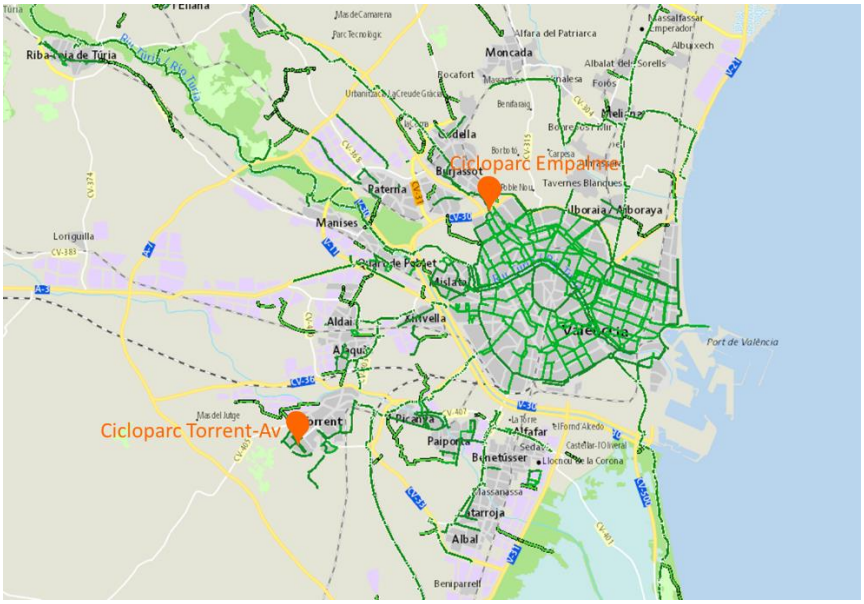


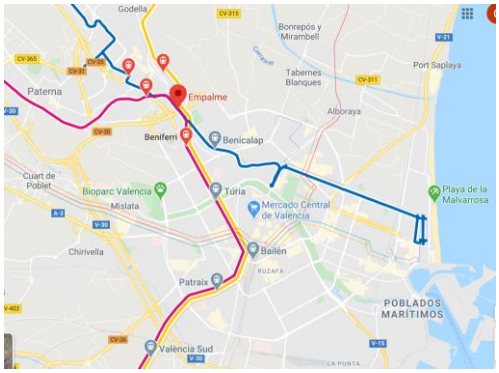
Figure 36: Location of Sprout Ciclоparcs and their connexions with the bike lines of Valencia metropolitan area (Source: Generalitat Valenciana and FV)

As regards of the **e-lockers**, the field visit was carried out with Correos and based on the availability of space and the preferences of the users, **Colón** and **Xàtiva** where selected as optimal locations. These are the two busiest stations in the metro network as shown in previous Table 14.

BIKE PARKING PILOT

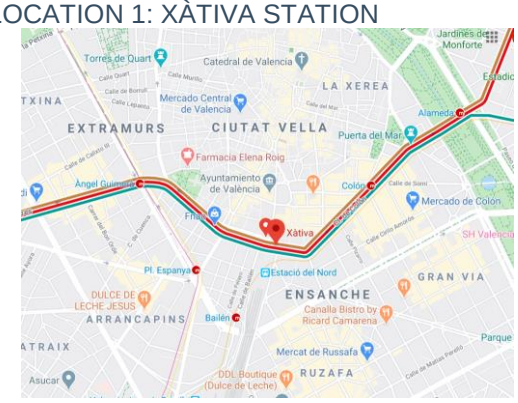
LOCATION 1: TORRENT AVINGUDA METRO STATION

LOCATION 2: EMPALME METRO STATION



E- LOCKERS PILOT

LOCATION 1: XÀTIVA STATION



LOCATION 2: COLON

Figure 37: Location for the Use Cases of Valencia

As explained below, the regional government's policies support sustainable mobility and non-motorized modes of transport. In addition, municipalities are making a special effort to improve their cycling network. Thus, this project links with the actions of regional and municipal public institutions. For this reason, Ferrocarrils de la Generalitat Valenciana (FGV), which is a public company under the regional government, has expanded the offer of Cicloparcs and we have been able to incorporate information about them into the project. The other two metro stations at metropolitan area of Valencia are Alboraya-Palmaret and Quart.

The following figure shows the map of the metro network of Valencia with the locations of the five existing Cicloparcs and the two e-lockers:

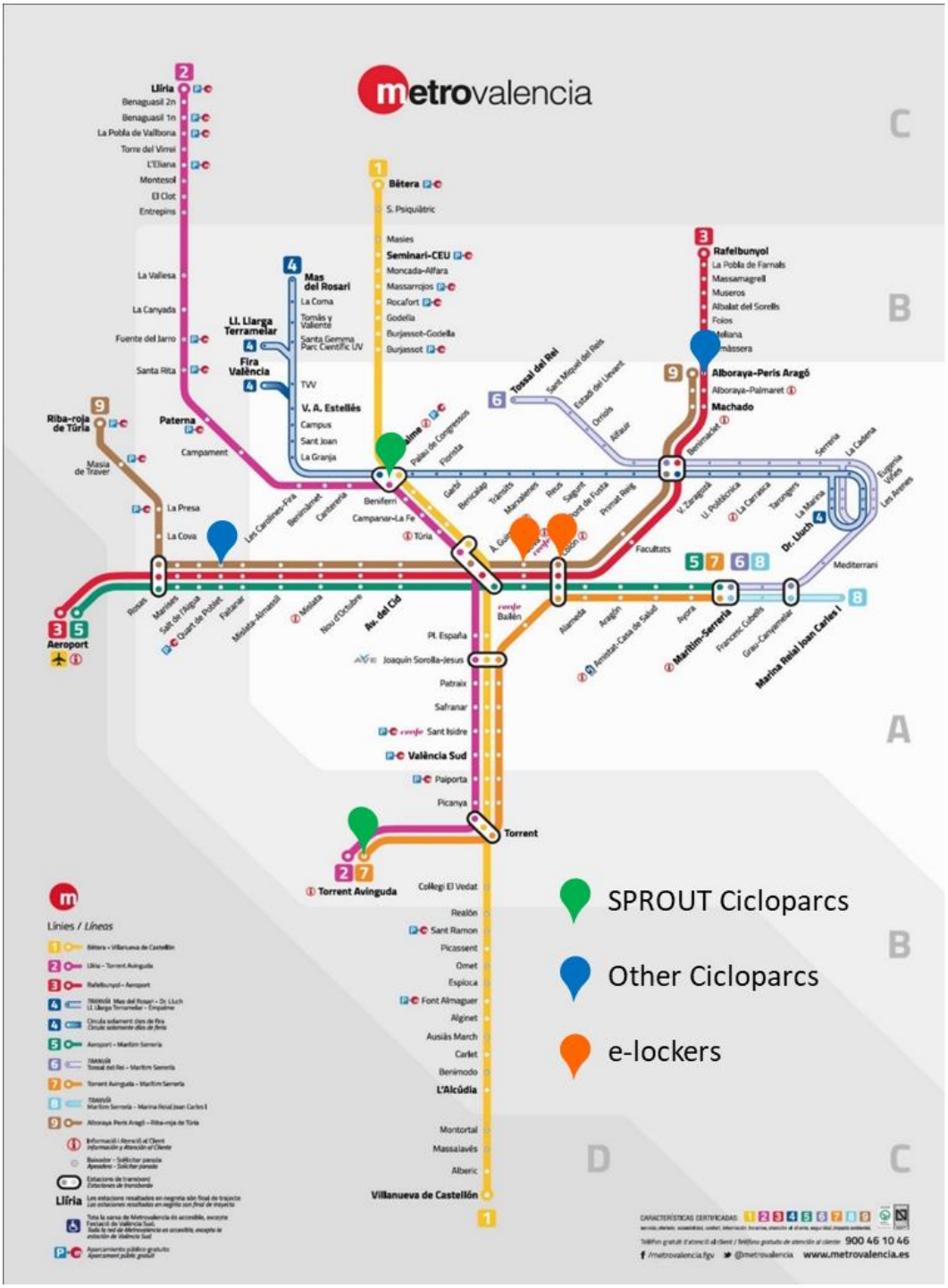


Figure 38: *MetroValencia* network and location of Cicloparcs and e-lockers

On the other hand, as FGV manages both the transport services of Metrovalencia and the TRAM of Alacant, for policies of regional balance and equity, the third location selected for an extra Cicloparc was at the tram line of Alacant, and Benidorm station was chosen with the same criteria as those used before: space available, passengers' preferences, security and number of passengers.

The metropolitan area of Alacant includes almost half a million inhabitants, of nine cities and towns. Alacant has almost 340,000 inhabitants.

Regarding the Tram of Alacant, it has four lines and almost 70 stations, some of the out of the metropolitan area of Alacant, connecting important tourist villages as Denia, Calpe, Altea, etc.

Benidorm, with 70,500 inhabitants is the largest municipality connected by tramway with Alacant. The City Council of Benidorm, has a Cycling Plan that aims to reach by the end of 2021 the 134 kilometers of cycling routes, thus becoming the second city of the Valencian Community in surface area for cycling, only behind Valencia capital. It includes bicycle lanes, cycle paths, cycle routes and pedestrian areas where bicycles are allowed to circulate, with an adequate meshing to allow cycling from one end of the city to the other.

Figure 39: Map of Benidorm bike lanes (Source: *Benidorm city council*)

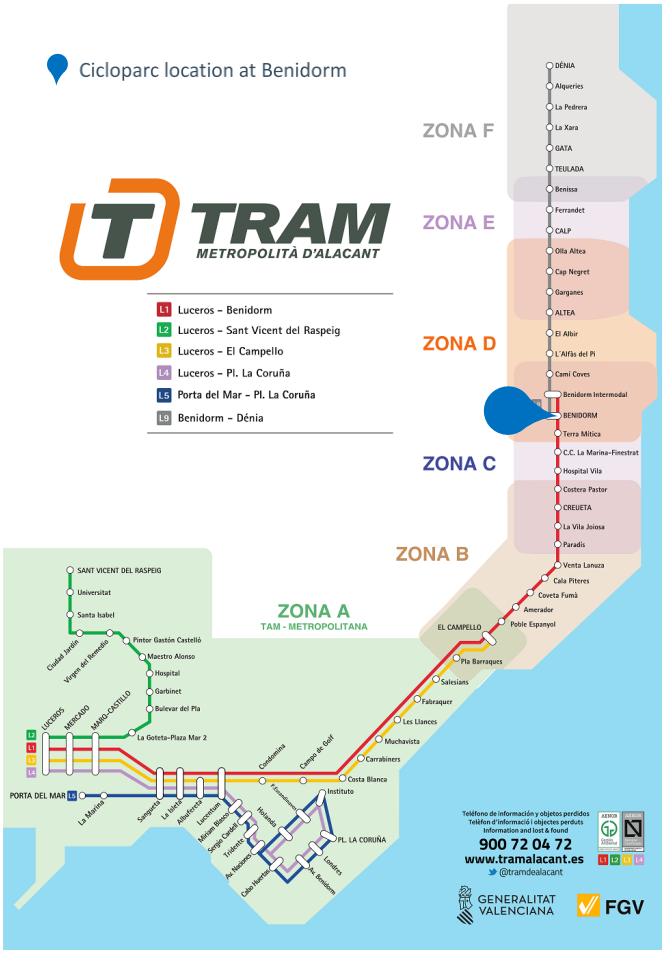


Figure 40: Location for the Use Case 1 at the tram of Alacant

Annex 2: Design of a business model canvas

The Business Model Canvas is a strategic management template for developing new business models or documenting existing ones. It is a visual graphic with nine key elements covering the four main areas of a business: customers, offering, infrastructure and economic viability, describing the value proposition, customers and financial aspect.

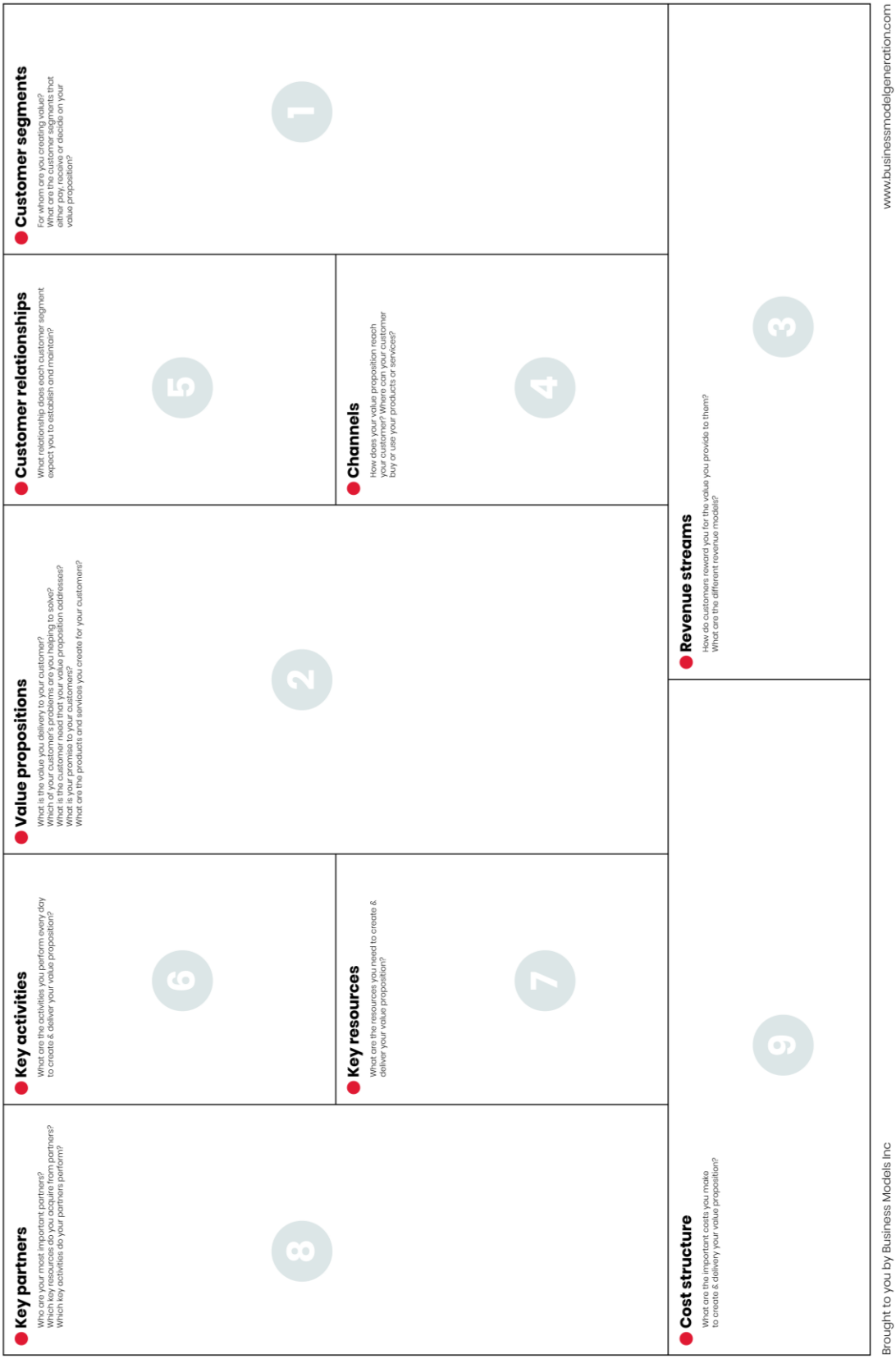


Figure 41: Business Canvas template

In both cases, we have started by working on the value proposition (2), placed in the centre of the canvas. The right side are the external relationships: we have to take our value proposition

to a series of customers (1) (which is located on the right), with whom we will have to establish a series of relationships (5). And to deliver that value proposition to customers, we have to do it through a number of channels (4). From the inside (on the left side of the canvas), we have the key activities (6) and resources (7), i.e., what we have to do and what is critical within our business model, and the key partners (8) we will work with. And last but not least, and no less important than the other seven elements, the cost structure (9) and revenue streams (3) of our business.[4]

To facilitate the elaboration of the Canvas business model, in addition to the description of each of the nine fundamental elements, a series of questions are usually used in the work sessions, the answers to which guide and focus the reflection and discussion:

1. Customer segments

   List the top segments. Look for the segments that provide the most revenue.
   Who is your most important customer?

2. Value proposition

   What are your products and services?
   What core value do you deliver to the customer?
   Which customer needs are you satisfying?

3. Revenue streams

   List your top revenue streams. If you do things for free, add them here too.
   For what value are your customers willing to pay?
   What and how do they pay? How would they prefer to pay?

4. Channels

   How do you communicate with your customer?
   Through which channels that your customers want to be reached?
   Which channels work best? How much do they cost? How can they be integrated into your and your customers' routines?

5. Customer relationships

   How does this show up and how do you maintain the relationship?
   What relationship that the target customer expects you to establish?

6. Key activities

   What key activities does your value proposition require?
   What activities are important the most in distribution channels, customer relationships, revenue stream…?

7. Key resources

   The people, knowledge, means, and money you need to run your business.
   What key resources does your value proposition require?

8. Key partners

[4] https://www.emprendedores.es/gestion/modelo-3/

List the partners that you can’t do business without (not suppliers).
Who are your key partners/suppliers?
What are the motivations for the partnerships?

9. Cost structure

   List your top costs by looking at activities and resources.
   What are the most cost in your business?
   Which key resources/ activities are most expensive?

Annex 3: Stakeholders involved in the Pilot

- **Fundación Valenciaport (Innovation Centre)**

It is the partner in charge of coordinating the pilot in the city of Valencia and has been involved in the project from the beginning.

Fundación Valenciaport is an Applied Research, Innovation & Training centre providing services to the port and logistics cluster. This initiative of the Port Authority of Valencia has enjoyed the collaboration of notable businesses, universities and institutions from the port community. Urban transport, of both freight and passengers, has a major impact on cities in terms of pollution, noise and congestion. Fundación Valenciaport collaborates with the main entities that have the capacity to establish policies to improve the port-city interface, reduces externalities and ultimately contribute to the target of zero emissions by 2050 set by the European Commission. In particular, within this area of activity, work is being done to develop innovative and sustainable solutions for the distribution of freight and mobility of people thereby contributing to a better quality of life for citizens.

It coordinates the participation of all Valencian partners and stakeholders in the project, is in charge of communication with the project leaders, carries out deliverables, organizes workshops, designs and conducts surveys, and participates in the ones that some work packages require, coordinates the implementation of use cases, is in charge of data collection and evaluation, contributes to the definition of policies and participates in the dissemination of the project.

- **Ferrocarrils de la Generalitat Valenciana (Public Transport Operator)**

FGV manages the transport services of Metrovalencia and the Alacant TRAM. Metrovalencia encompasses the metro and tramway network that covers the city of Valencia, its metropolitan area and areas of influence. It has 133 stations distributed along 156 kilometers. TRAM Metropolitano de Alacant, whose network serves the city of Alacant, its metropolitan area and the axis of the Costa Blanca to Denia, has 71 stations distributed along five lines linking 13 municipalities.

It is a valuable partner for the pilot of Valencia in all its dimensions.

FGV has been involved from the beginning of the project in the implementation of the pilot, its evaluation and the proposal of policy improvements. Specifically, it actively participated in the selection of the most suitable stations to develop the use cases: Cicloparcs (bike parking) in stations in the metropolitan area and e-lockers in stations in the city of Valencia. It has paid the installation of two Cicloparcs in Torrent-Avinguda and Empalme. Additionally, it has placed three more in the stations of Alboraya-Perís Aragó, Quart de Poblet, and the Benodorm station of Alacant tram outside the project obligations. The Cicloparcs have electronic access and camera surveillance services. It has facilitated the possibility of using the Cicloparcs with FGV access tickets and is maintaining free use in all facilities beyond the pilot test period. For the evaluation of the pilot, it has provided usage data for all Cicloparcs in the requested formats and has added information when requested.

In the case of the e-lockers, FGV has agreed with Correos a contract for the use of the necessary space inside the Colón and Xátiva stations, which includes electricity supply, data network and surveillance. The management of this contract by FGV has been very agile, while Correos is a company with a very vertical and bureaucratic structure that has slowed down the implementation of this use case.

FGV has participated in the formulation, prioritization and validation of alternative policies responses. And additionally, it has actively participated in all project dissemination activities.

- **Generalitat Valenciana – Conselleria de Política Territorial, Obres Públiques i Mobilitat (Regional Government, Territorial Policy, Public Works and Mobility Department)**

The Department of Territorial Policy, Public Works and Mobility is assigned the competences in matters of territorial structuring, landscape, transport, ports, airports and public works.

It is responsible in the local government for sustainable mobility initiatives. Proposes and validates public policies. Participates through FGV. It has led the institutional inauguration of the Cicloparcs. Participates in surveys and workshops. It is monitoring the pilot progress follow-up as results will help in defining future policies. It has encouraged the installation of more Cicloparcs.

- **Ayuntamiento de Valencia (Valencia City Council)**

It is a necessary partner for the success of the pilot of Valencia. It is responsible for urban mobility in the city of Valencia in all its aspects: policies, plans, projects and management. It also has the Municipal Bicycle Agency of Valencia, a public entity of the Valencia City Council that is responsible for coordinating the necessary measures to increase the use of bicycles in an appropriate and safe way, both in the city of Valencia and in its municipal area.

It has validated the policies, has given information about public measures of sustainable mobility in València, and also participates in surveys and workshops.

- **Ayuntamiento de Torrente (Torrente City Council)**

It is responsible for mobility in the municipality of Torrent and collaborates in the definition of the connections of the municipal transport networks. It actively participates in the project in two aspects. On the one hand, it has collaborated in the selection of the location of the Torrent-Avinguda Cicloparc, has ceded the public land where it was installed and has participated in the validation of public policies. It also collaborates in surveys and workshops and has participated in the validation of policies for use case 1.

- **Empresa Municipal de Transportes (Municipal Transport Company)**

It is an entity that provides surface public transport service by means of buses in the city of Valencia (Spain) and some towns in its metropolitan area. It is wholly owned by the Valencia City Council.

It participates in the project as a public administration in workshops and answering surveys. It has a positive and proactive attitude in its own innovation projects and as a collaborator. It has participated in the validation of policies for use case 1.

- **Autoritat de Transport Metropolità de València (Metropolitan Transport Authority of Valencia)**

The Autoritat de Transport Metropolità de València is an autonomous organism of the Generalitat attached to the Conselleria de Política Territorial, Obres Públiques i Mobilitat, with the aim of coordinating the regular public transport of passengers in the Metropolitan Transport Area of Valencia.

It has participated as public administration in workshops and answering surveys.

- **Asociación ciclista local (Local bike association)**

Valencia en Bici is a group founded in 1990 that defends the bicycle as a means of transport that respects the environment and is friendly to other citizens. They consider that the bicycle is a tool for greening the urban and rural transport system. They are part of a statewide organization, CON BICI, which is a coordinating group of bicycle user groups that is playing a great role in the changes to the traffic law with the aim of making the bicycle a preferential and civilizing vehicle and in the intermodality with rail transport.

It has participated in the definition of the needs of the users of the Cicloparcs. They also collaborate in surveys and workshops. It has participated in the validation of policies for use case 1.

- **Correos, Citypaq**

Formerly was the public mail company of Spain but now is a private logistic operator. Citypac is the bran in charge of e-lockers a quick and easy solution to pick up, send or return parcels through smart lockers. They are located at densely populated neighborhoods, or in places of transit such as supermarkets, gas stations, shopping malls or train and metro stations.

For the use case 2, the e-lockers have been located in the two crowdest metro stations at the city of Valencia, and FGV has ceded the space and the connections in order to facilitate it because it is considered an environmental measure.

It has installed the e-lockers, gets the data and sends it to FVP and has participated in the validation of policies for use case 2.

- **Mobility technological company**

Has collaborated in workshops and surveys. It has contributed to the validation of public policies.

- **Consultancy company**

Has collaborated in workshops and surveys. It also has contributed to the validation of public policies.

Annex 4: Regional and local policies

In 2011, the regional government of Valencia established a new legal framework that aims to improve the mobility of the citizens of Valencia, as well as their quality of life, by promoting the planning and management of sustainable urban mobility.

In 2013 Valencia City Council approved the Valencia Urban Mobility Plan to promote the use of walking, cycling and public transport. As a follow-up, the city of Valencia is very interested in continuing to introduce new transport services and/or mixing them up using new business models, in order to reduce CO_2 emissions, noise and congestion in the city, both for passenger and freight transport. The identified objectives of the Sustainable Urban Mobility Planning (SUMP) are the following ones:

1) To ensure and enhance that the pedestrian remains the main protagonist of mobility in the city.
2) To consolidate and promote the expansion of the bicycle as a general and daily mode of transport for citizens.
3) Achieve a greater share of public transport participation in urban travel.
4) To review and redefine a road hierarchy in the city that allows a better organization of traffic flows through the city, so that the centre is no longer a passing route and recovers its character as an essential meeting point of the city and citizens.
5) Organising space for surface parking.
6) To encourage the decarbonisation of the transport system.
7) Make deterrence and prevention the basis of traffic discipline in the city.
8) To improve road safety and peaceful coexistence among all road users.
9) To achieve an accessible city for all citizens.
10) To improve the management of mobility.

In order to reach the aforementioned objective, the SUMP of Valencia includes five strategies. The ones aligned with the pilot use case that may facilitate the definition of new policies are:

> Strategy 5: Facilitate and standardize the use of the bicycle as a daily and habitual mode of transport for Valencians.
>
> Strategy 8: Enhance intermodality, coordination and integration of urban and interurban public transport.

On the other hand, the Generalitat Valenciana[5] defined in July 2018 the Basic Mobility Plan for the Metropolitan Area of Valencia with the following objectives:

1. To consolidate, from its condition of mature Metropolitan Area, a polycentric urban region that facilitated agile exchanges of people and goods, essential to guarantee the development and well-being of the population.
2. To promote public transport. to improve the coverage, quality, safety and accessibility of the service to promote intermodality and transfer journeys in private vehicles to the collective transport system.

[5] Generalitat Valenciana, Metropolitan Basic Mobility Plan

3. Recover public road space for non-mechanized modes of transport for pedestrians and cyclists, improving the quality of the urban environment to restore the streets and squares to their role as first class spaces for coexistence
4. Improve the safety of journeys, reduce accidents and focus actions by paying special attention to the most vulnerable people.
5. To remove barriers to the movement of people with reduced mobility and make it universally accessible.
6. Efficient traffic and parking management in line with policies to promote public transport and non-mechanised modes of transport.
7. Improve freight loading and distribution operations to maintain their essential function with the least possible harm to other users of public space.
8. Reduce noise pollution and ensure more efficient energy consumption in the field of mobility.
9. To gradually introduce new technologies applied to mobility
10. Provide a strategic planning document to the new Single Transport Authority.
11. To provide sustainable mobility criteria for an urban and territorial policy that supports the compact Mediterranean city.
12. To promote the widest citizen participation in the elaboration and subsequent management of the Plan.
13. To inform and educate the population, especially the youngest, on the advantages of developing more sustainable mobility habits.

With these objectives, 45 proposals for short and medium-term action have been established, divided into 9 strategic lines:

1. NM Encourage non-motorised mobility (9 proposals)
2. TPS Improve and enhance metropolitan surface public transport (6 proposals)
3. TPF Improving public rail transport (1 proposal)
4. **INT Intermodality as a priority in metropolitan mobility (4 proposals)**
5. GES Management and coordination of metropolitan mobility (7 proposals)
6. TER Coordination of territorial development and mobility (3 proposals)
7. MERO: Improvement of the metropolitan logistics system (2 proposals)
8. EE Energy efficiency, sustainable mobility and environment (6 proposals)
9. *PAR Public participation and knowledge in the field of mobility (7 proposals)

In particular, the 4th INT action line 'Intermodality as a priority in metropolitan mobility' envisages the development of a network of bicycle parking facilities at public transport stops. The proposal, proposes 21 safe bicycle parking spaces (closed areas at suburban stations and 35 at metropolitan metro stops). In particular, the SPROUT pilots are framed within this line of action. Therefore, SPROUT will act as preliminary case of study to be widely implemented on the Metropolitan metro network. Based on the results of SPROUT policies and recommendation will be define in order to support the full implementation of the strategy towards the implementation of the intermodality at metropolitan area (Line of Action "4"). In this sense, FGV has installed three additional Cicloparcs in the metro and tram networks of Valencia and Alacant: Alboraya-Palmaret, Quart and Benidorm.

Annex 5: T4.3 Data collection surveys

These are the questionnaires for Valencia use cases:

Cicloparc User's Survey

1) In general, in favour of the short and quick questionnaires, so we agree with the view of Valencia with a limited number of questions and all oriented to the main question that we want to answer which is: which mode they used prior the Cicloparc, how many kms are driven until the metro station and how often they use this service.
2) Additional proposal is that the questions are more descriptive in order to facilitate the filling in of the questionnaire and to be easily analysed:

More specifically:

Question 1: What is the mode of transport that you usually use for reaching a destination inside the city?

- ☐ I usually use the metro station
- ☐ I usually use my car
- ☐ Other mode (walking or cycling or electric vehicles)

Question 2: What is the average daily driven (kms) distance that you implement[6]?

- ☐ Less than 10 kms
- ☐ 10-20 kms
- ☐ 20-30kms
- ☐ 30-50 kms
- ☐ 50-70 kms
- ☐ 70-80km
- ☐ More than 80kms

Question 3: How often do you use the metro for your transportation?

- ☐ One or Two times per week
- ☐ Three to Four times per week
- ☐ Everyday

Question 4: What is your usual metro station destination? _____

Question 5: Before the implementation of the Cicloparc which mode did you usually use for reaching the metro station?

- ☐ My Car
- ☐ By foot
- ☐ My bike

[6] Note about the distance : The average daily driven distance in 2012 in Spain was approximately 70-80kms. (EC, 2012 JRC SCIENTIFIC AND POLICY RESPONSE , Driving and parking patterns of European car drivers- a mobility survey)

Question 6: How many kms did or do you drive/walk for reaching the metro station?

- ☐ 0-2 kms
- ☐ 2-4 kms
- ☐ More than 4 kms

Question 7: Following the Cicloparc would you change the usual transport mode for reaching the metro station? (Question 5)

- ☐ Yes
- ☐ No
- ☐ Maybe

Question 8: Following the Cicloparc would you change the usual transport mode for reaching a destination within the city? (Question 1)

- ☐ Yes
- ☐ No
- ☐ Maybe

Question 9: How often do you use or will you use this Cicloparc?

- ☐ One to Two times per week
- ☐ Three to Four times per week
- ☐ Everyday

Citypaq User's Survey

This questionnaire has been designed with a very limited number of questions in order to take the minimum time to answer and to obtain the information needed to calculate the GHG emissions savings: how the purchases were made (in person or electronically) and, in this case, how the packages were received. It is necessary to know:

- number of face-to-face purchases replaced by electronic ones
- number of electronic purchases received at home replaced by those received at Citypaq.
- Distance traveled with the package.

Question 1: How many purchases per month do you make electronically?

- ☐ Once or twice a month
- ☐ Once a week
- ☐ Twice a week
- ☐ More than 10 times a month

Question 2: Where do you usually receive your purchases made electronically?

- ☐ At home
- ☐ At work
- ☐ At collection points (kiosks, stationery stores, ...)
- ☐ At the store of my choice of the chain where I made my purchase
- ☐ At electronic lockers
- ☐ Other _____

Question 3: How often do you use the metro for your commute?

- ☐ Occasionally
- ☐ Once or twice a week
- ☐ Three to four times a week

- ☐ On weekdays
- ☐ On weekends
- ☐ Every day

Question 4: What is your usual metro station of origin? _____

destination? _____

Question 5: Would you use the e-locker?

- ☐ Yes
- ☐ No
- ☐ Maybe

Open comment:

Annex 6: Detailed financial analysis for Cicloparcs

With regard to the financial analysis, each Cicloparc has an acquisition cost of 14,000 euros and an annual maintenance and operating cost of 1,000 euros.

It has been possible to calculate the minimum price for parking the bike that should be added to the ticket for financial profitability according to the number of daily users (Figure 16) considering 10 years of useful life. It ranges from €6.58 when there is only one user per day throughout the year, to €0.41 for 16 users per day.

For the current occupancy values of 3 or 4 users, the cost of the Cicloparc to be added to the ticket would be €2.19 and €1.64 respectively.

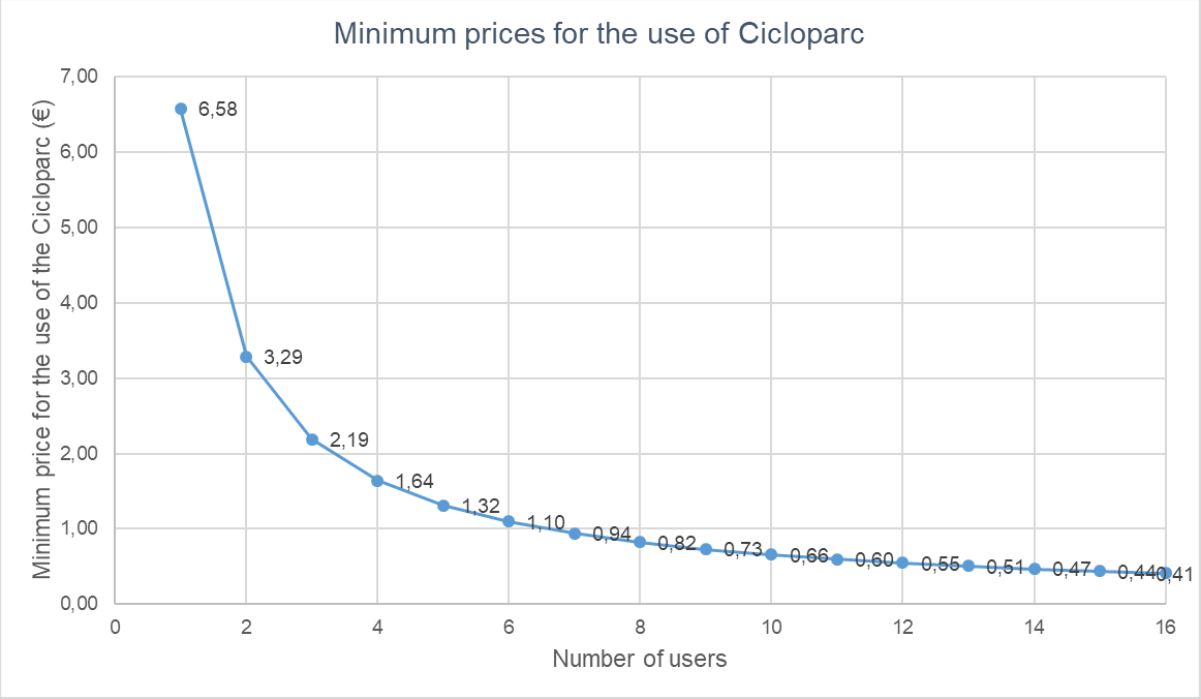


Figure 42: Use case 1: Cicloparc price for user

The price of the metro ticket depends on the type of ticket (single, round-trip, metro pass, special users) (Figure 38) and the number of zones covered (see Figure 31)

	1 zone A, B, C o D	2 zones AB, BC o CD	3 zones ABC o BCD	4 zones ABCD
Single ticket	1,50 €	2,10 €	2,80 €	3,90 €
Round trip ticket	2,90 €	4,00 €	5,30 €	7,40 €
Metro pass	7,20 €	10,40 €	14,00 €	20,00 €
Senior citizen pass	—	—	—	9,70 €
Monthly pass	—	—	—	9,70 €
Annual pass	—	—	—	87,30 €

Figure 43: Use case 1: Price according to zones travelled and type of ticket

The price for users of Alboraia Peris Aragó metro station (Zone A), considering the roundtrip fare with a passcard, the Cicloparc parking can be 460% of the price of the roundtrip ticket when there is only one user (6.58€ + 1.44€) or 30% (0.41€ + 1.44€) when there are 16. In the latter case, a ticket price increase of 30% for the use of the Cicloparc would be a deterrent for many users (**Error! Reference source not found.**). On the other hand, for Torrent Avinguda u sers (Zone B), the Cicloparc parking can be 315% of the price of the roundtrip ticket when there is only one user (6.58€ +2.08 €) or 20% (0.41€ + 2.08€) when there are 16 (**Error! R eference source not found.**). For the current occupancy values of 4 users in Alboraia Peris Aragó, the cost of the ticket plus the Cicloparc would be 1.44€ + 1.64€ = 3.08€.

For Torrent Avinguda, with 3 users, the cost of the ticket plus the Cicloparc would be 2.08€ + 2.19€ = 4.27€

As a measure to encourage their use and attract passengers, FGV has assumed the cost of the Cicloparcs and the service has been offered free of charge in all of them since they were put into operation.

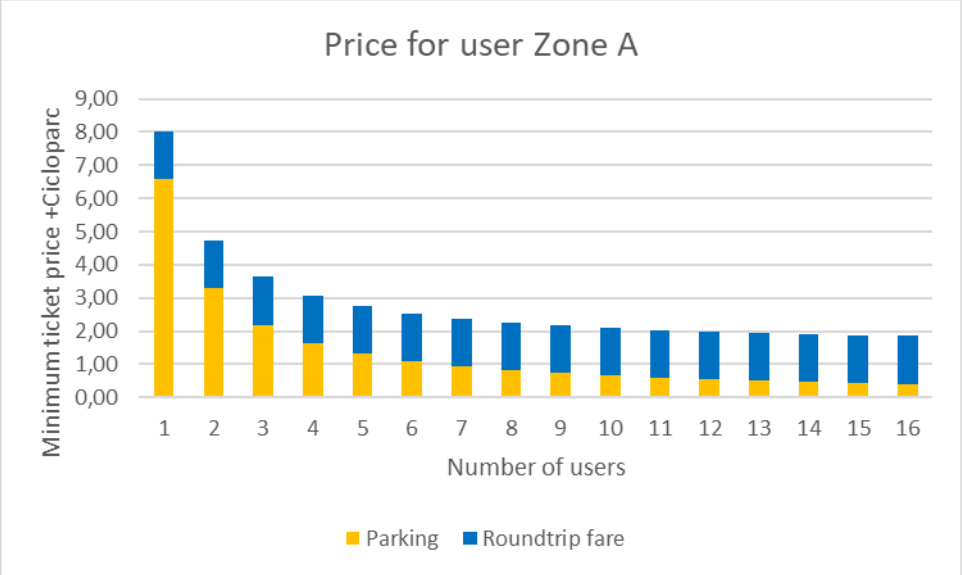


Figure 44: Ticket+Cicloparc minimum price for Zone A users

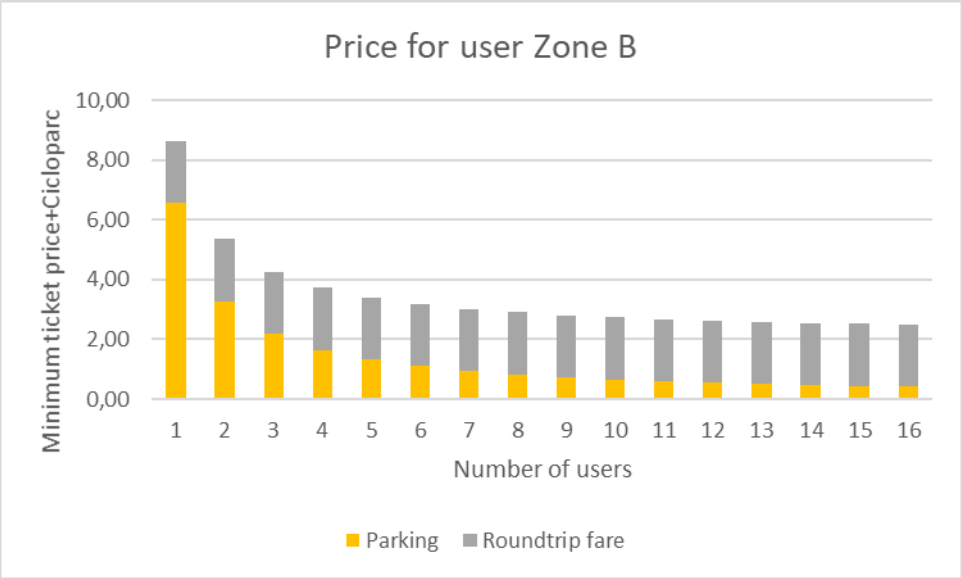


Figure 45: Ticket+Cicloparc minimum price for Zone B users

Annex 7: T4.4 Templates

1. Problem identification template- SIS step 1

Goals

- Develop a list of alternative policy responses for each pilot
    - Based on:
        - T3.3- Policy impact assessment of future urban mobility scenarios
        - T4.2- Results from the operational assessment of the pilots
- Prioritisation of alternative policy responses
    - Through multi-actor-multi-criteria analysis (MAMCA)

Input needed

In order to develop and prioritise the alternative policy responses, the answer to the following questions is needed:

1. What is the main problem you encounter in relations with your pilot?
2. What are the possible (policy) solutions to this problem?

An example could be as follows:

1. Main problem encountered: the integration of autonomous pods with surrounding traffic does not happen properly and creates dangerous situations.
2. Possible policy solutions:
    a. Making the area around the pods' path a 30km/h zone;
    b. Developing a smart traffic light system that favours the pods so that car traffic is halted when they need to cross.

In order to ensure the correct development of this Task 4.4, we need the **main issue** you encounter with your pilot, and at least 2 possible solutions to that issue. Of course, it is possible to offer more than 2 solutions as well.

The template below needs to be filled in and sent to **sara.marie.tori@vub.be** by **Oct. 30, 2020**.

Template

Please fill in the template below. If you have more than one regarding the pilot, feel free to add an extra item to the list. However, the first issue should be the **main one**.

Main issue with the pilot

- Description of the problem encountered:
- Description of the possible policy solutions to the problem:
    1. ...
    2. ...

2. Stakeholder criteria request for Valencia - SIS step 3

Dear SPROUT stakeholders,

We are now a year and a half into the project. Up to now, we have inventoried the drivers of the transformations in urban mobility, and developed scenarios for the future of urban mobility in your city. To those of you who participated in the workshops to help build the scenarios, thank you again! You can take a look at the scenarios and their visualisations here (under the 'Resources' tab). As you may also know, pilot projects are now underway to test an innovative urban mobility solution in your city.

As part of the next step in the SPROUT project, we are looking at alternative policy responses for the pilots being implemented, based on issues that the SPROUT team uncovered during the implementation. This will be done through a modified multi-actor multi-criteria analysis (MAMCA), which is an evaluation that takes into consideration different stakeholders and their priorities.

As one of the first steps of the process, we need your input. We want to know what your objectives are with regards to your city's urban mobility environment, in terms of the pilot that is being implemented, in the next 10 years. Below, you will find two short descriptions of the pilot. The first is the pilot as it is today; the second description is a situation where policy changes have been implemented as a result of the pilot. What we would like to know from you is the following: if we were to implement the alternative, what factors are important in your eyes that we need to pay attention to? In other words, **what makes a good alternative better than a bad alternative**? These factors can be positive, but also negative. To give you an idea of what we mean, these are a few example criteria against which alternatives can be evaluated: traffic safety, cost, accessibility, air pollution, noise, impact on other transport modes, etc.

We ask you to send us **between 2 and 6 criteria** that are important to you by **January 4, 2021**.

Collecting your objectives is the first part of the MAMCA. Once we have all of them, we will get back in touch with you with a short survey for the actual evaluation process.

Best regards,

The SPROUT team

Scenarios:

1. Do-nothing alternative (the pilot as it is today): shared micromobility points without regulation for storing the vehicles.
2. Shared micromobility points with regulation that requires public space designers to plan space to store shared micromobility vehicles within a specified zone, and that will define the number of dedicated spaces for shared micromobility devices.

3. Expert evaluation form- SIS step 4

To be filled in by the scientific partners

Instructions:

In this phase of the Task 4.4 Multi-Actor Multi-Criteria analysis, we have collected local stakeholders' objectives with regards to your pilot. For this next step, we ask you to **evaluate the two scenarios** (the situation with and without the pilot) against these objectives. In order to do this, the table below lists all the stakeholder criteria that need to be evaluated. For each criterion, the following question needs to be answered: how does the second scenario (i.e. the scenario with the pilot implementation) score in terms of this objective? The drop-down menu allows you to choose between:

- Very negative;
- Negative;
- Slightly negative;
- No change;
- Slightly positive;
- Positive;
- Very positive.

For example: if I were to implement parcel lockers at a metro station, I could have the following evaluation:

- Very positive in terms of accessibility to customers (customers can now access their parcels any time they want);
- Negative in terms of financial feasibility (there is a cost associated with the implementation of the lockers).

In order for us to understand the evaluations, please write a (short) justification in the last column. If the evaluation is based on figures that are at your disposal, please also include those (for example, if you have a concrete implementation cost for the lockers in the example above, this needs to be added in the justification column).

Many thanks!

The Sprout Team

4. Stakeholder evaluation form Valencia- SIS step 5

Intro and stakeholder group

You are invited to take part in a European funded project called SPROUT, which aims at developing innovative policy responses to urban mobility challenges.

We ask you to fill in the following questionnaire as part of the stakeholder evaluation of the pilot of the smart bike parkings in Valencia. It will take no longer than 5 minutes. You can withdraw at any moment.

By participating in the survey, you consent to use the data you provide in SPROUT and to make them publicly available in anonymised form. Your privacy will be respected in any case. For more information regarding SPROUT and the data you provide, please contact

privacy@zlc.edu.es. Thank you very much for your collaboration.

To which of these stakeholder groups do you belong?

- ☐ Mobility technological company
- ☐ Consultancy company
- ☐ Local bike association
- ☐ Metropolitan mobility authority
- ☐ Municipal transport authority
- ☐ Metropolitan metro company
- ☐ Torrent city council

Mobility technological company

Below you can see the criteria that you indicated as being important for a successful project. Please indicate how important you feel each criterion is for you, on a scale from 0 to 10

(0 = not important at all, 10 = extremely important).

	0	1	2	3	4	5	6	7	8	9	10
Infrastructure integration	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Facilitation of intermodality	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Security for bike owners	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Emissions reductions	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Increase in modal shift	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Consultancy company

Below you can see the criteria that you indicated as being important for a successful project. Please indicate how important you feel each criterion is for you, on a scale from 0 to 10

(0 = not important at all, 10 = extremely important).

	0	1	2	3	4	5	6	7	8	9	10
Infrastructure integration	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Facilitation of intermodality	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Improving end-user experience	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Increase in environmental awareness of citizens and businesses	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Reduction in car use	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Cost for users	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Local bike association

Below you can see the criteria that you indicated as being important for a successful project. Please indicate how important you feel each criterion is for you, on a scale from 0 to 10

(0 = not important at all, 10 = extremely important).

	0	1	2	3	4	5	6	7	8	9	10
Facilitation of intermodality	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Safety for bikers	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Cost of investment	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Accessibility to bike owners	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Reduction in emissions	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Reduction in noise pollution	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Metropolitan mobility authority

Below you can see the criteria that you indicated as being important for a successful project. Please indicate how important you feel each criterion is for you, on a scale from 0 to 10

(0 = not important at all, 10 = extremely important).

	0	1	2	3	4	5	6	7	8	9	10
Increase in public transport digitalization	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Facilitation of intermodality	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Municipal transport authority

Below you can see the criteria that you indicated as being important for a successful project. Please indicate how important you feel each criterion is for you, on a scale from 0 to 10

(0 = not important at all, 10 = extremely important).

	0	1	2	3	4	5	6	7	8	9	10
Accessibility for bike owners	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Security for bike owners	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Infrastructure integration	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Cost for users	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Ease of use	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Metropolitan metro company

Below you can see the criteria that you indicated as being important for a successful project. Please indicate how important you feel each criterion is for you, on a scale from 0 to 10

(0 = not important at all, 10 = extremely important).

	0	1	2	3	4	5	6	7	8	9	10
Increase in environmental awareness	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Security for bike owners	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Infrastructure integration	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Compatibility with other electric vehicles	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Torrent city council

Below you can see the criteria that you indicated as being important for a successful project. Please indicate how important you feel each criterion is for you, on a scale from 0 to 10

(0 = not important at all, 10 = extremely important).

	0	1	2	3	4	5	6	7	8	9	10
Infrastructure integration	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Facilitation of intermodality	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Increase safety for pedestrians and cyclists	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Cost of investment	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Stakeholder ranking

Below you can see the different stakeholder groups that are impacted by or impact the Padua pilot. Please rank the stakeholder groups from most impacted (1) to least impacted (7).

____ Mobility technological company

____ Consultancy company

____ Local bike association

____ Metropolitan mobility authority

____ Municipal transport authority

____ Metropolitan metro company

____ Torrent city council

Pilot improvement

How could the pilot be improved, in your opinion?

Do you see other alternative policy responses that could benefit the pilot implementation?

- Yes
- No

What other alternative policy responses do you think could benefit the pilot implementation?

Conclusion

Thank you for your answers!

If you have any questions, don't hesitate to get in touch with us! sara.marie.tori@vub.be geert.te.boveldt@vub.be

If you are interested in staying up to date with the SPROUT project, visit sprout-civitas.eu.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grand agreement No 814910

Annex 8: T4.5 Implementation feasibility

Use case 1

Implementation feasibility: First stage

Technical feasibility dimension aims at assessing the pool of resources that each of the alternative policy responses requires.

According to the opinion of the involved stakeholders, the policy measure PM1 represents a critical alternative from the aspect of technical feasibility since its average rating value (5-tier scale) falls slightly below the 2.5 threshold (Figure 46).

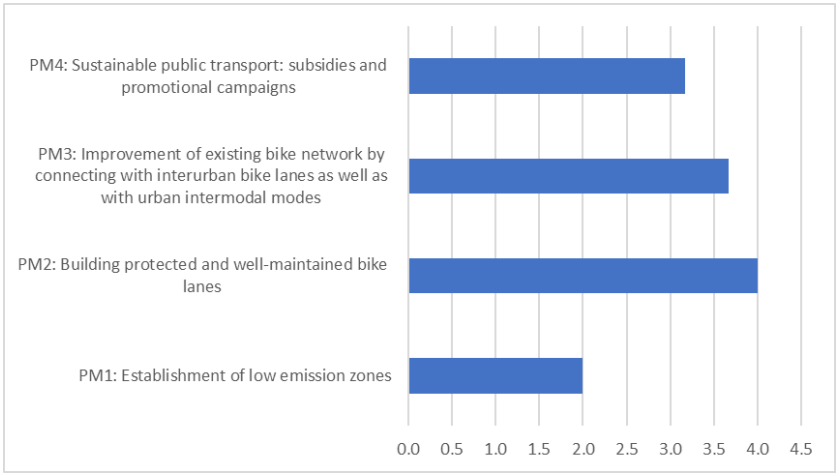


Figure 46. Assessment of policy measures against the technical feasibility dimension

In order to assess potential risks as well as the risk mitigation strategies for the implementation of PM1 from the technical feasibility aspect a round table will be organized.
Financial feasibility includes evaluation of following cost categories: direct costs, indirect costs, fixed costs as well as operations and maintenance costs; as well as the selected benefit categories: direct and indirect benefits.
According to respondent opinions (Figure 47 - Figure 52) the following conclusions are derived:

1. From the aspect of indirect, fixed and operation and maintenance costs PM2 and PM3 requires additional analysis. It is important to emphasize that PM2 obtains a score of 2.5 in the categories of fixed and operational and maintenance costs. In the methodology, this value was defined as the limit to consider an unfeasible measure. In this case, as PM2 receives a score below the limit of 2.5 for fixed costs, it was considered relevant to also analyze the categories of operational and fixed costs of this measure during the second round of the methodology
2. From the aspect of indirect benefits, all policy measure will produce positive outcomes. However, PM1 receives the lowest score which falls right on the edge of the analysis. As it is considered the only technically unfeasible measure, it will be analyzed in more detail in the second round of the methodology.

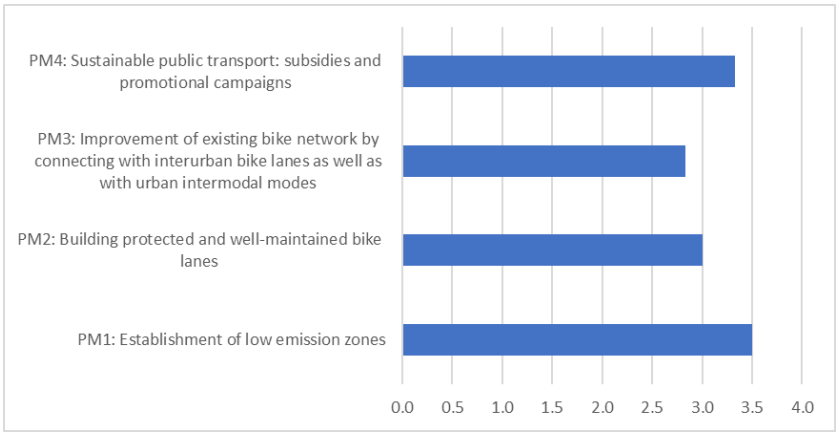


Figure 47. Assessment of policy measures against the financial feasibility dimension: Direct costs

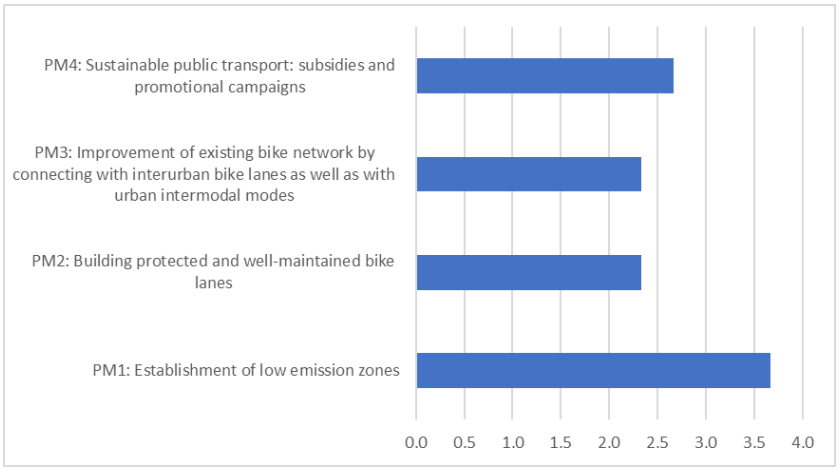


Figure 48. Assessment of policy measures against the financial feasibility dimension: Indirect costs

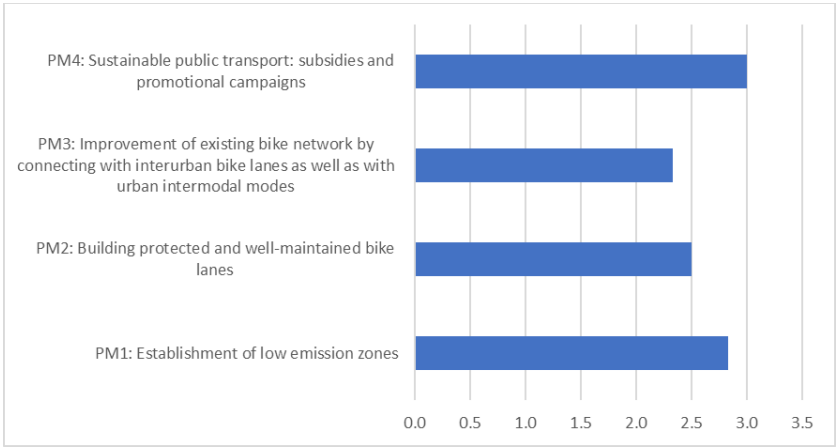


Figure 49. Assessment of policy measures against the financial feasibility dimension: Fixed costs

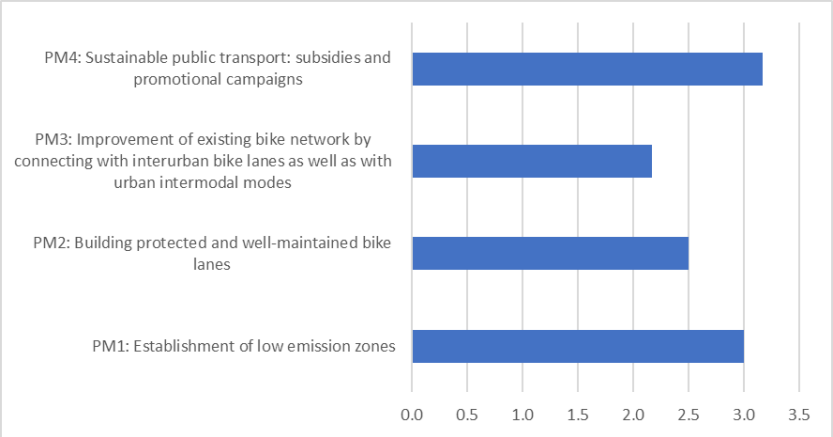


Figure 50. Assessment of policy measures against the financial feasibility dimension: Operations and maintenance costs

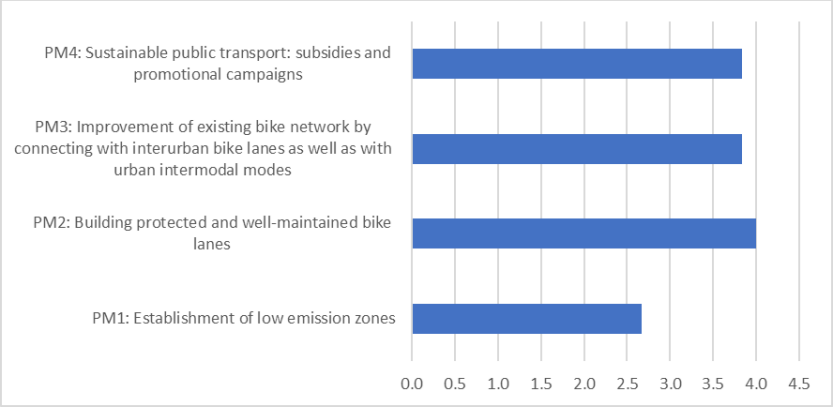


Figure 51. Assessment of policy measures against the financial feasibility dimension: Direct benefits

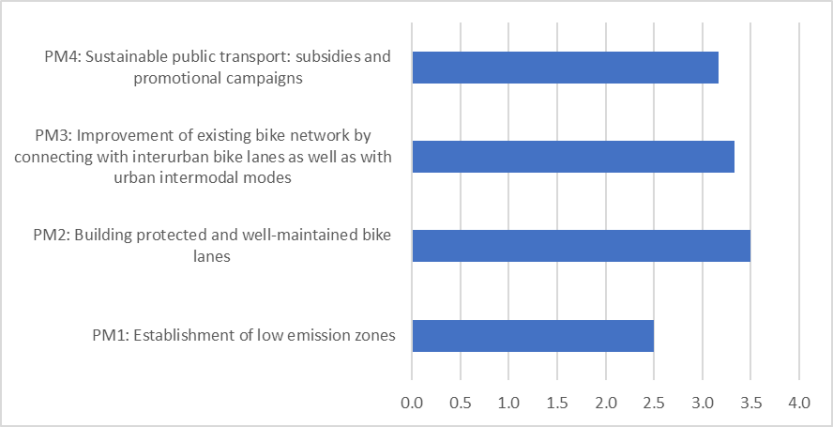


Figure 52. Assessment of policy measures against the financial feasibility dimension: Indirect benefits

Political feasibility includes evaluation of acceptability of alternative policy measures from the aspect of relevant stakeholders. The following conclusions are derived from the responses (Figure 53- Figure 56):

- Public transport operator: PM2 and PM3 are not acceptable;
- Public administration: All PMs are acceptable;
- New mobility service operators: PM4 is not acceptable;

- Data/Tech companies: PM2 and PM3 are not acceptable.

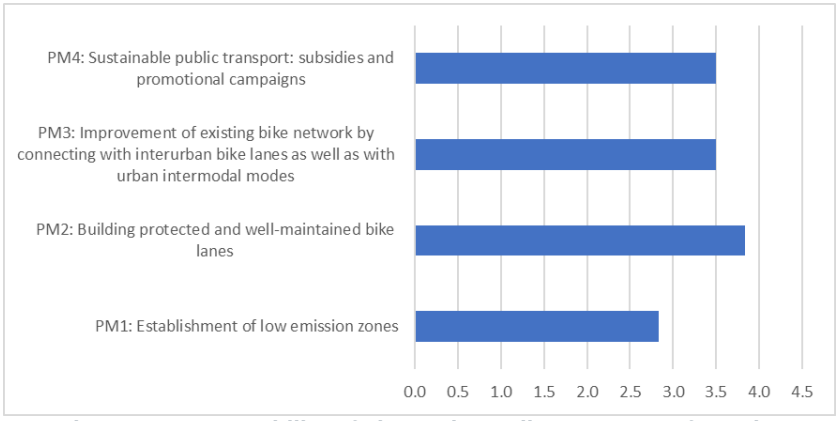


Figure 53. Acceptability of alternative policy measures from the aspect of Public Administration.

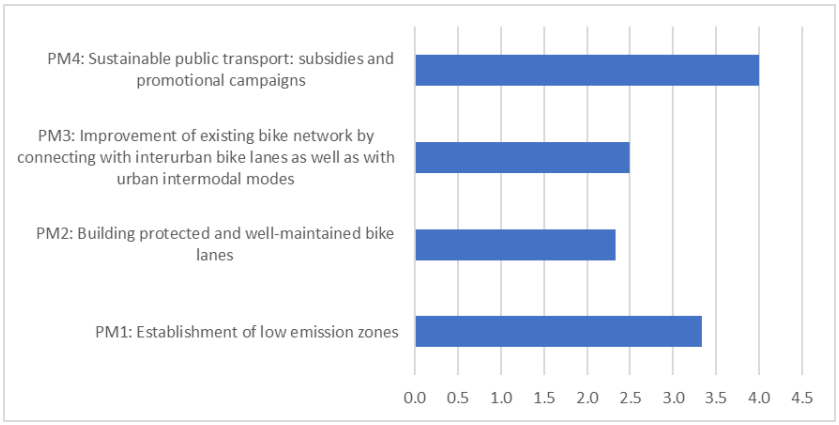


Figure 54. Acceptability of alternative policy measures from the aspect of Public transport operator.

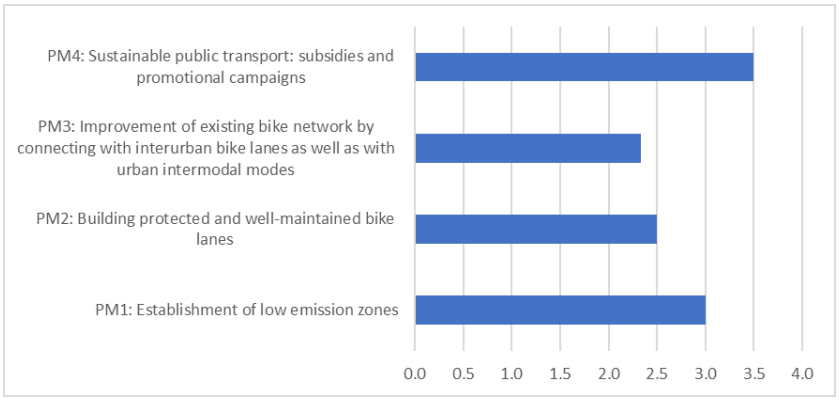


Figure 55. Acceptability of alternative policy measures from the aspect of Data/ Tech companies.

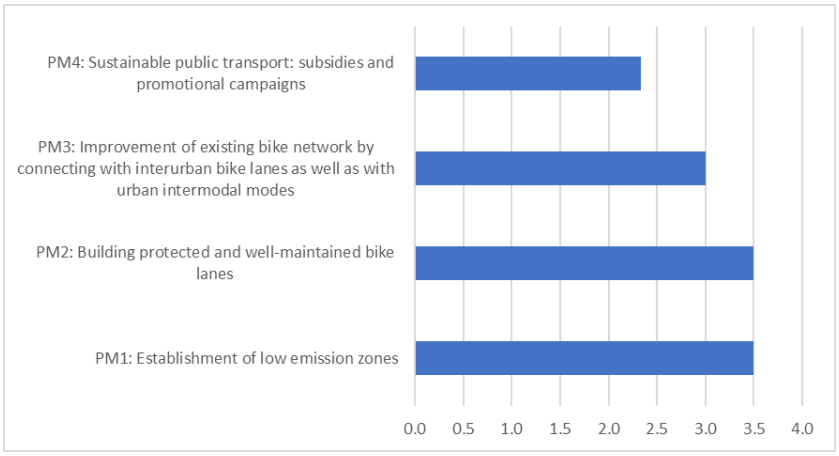


Figure 56. Acceptability of alternative policy measures from the aspect of New mobility service operator.

Administrative operability and capability are the main criteria for assessment of policy measures against the political feasibility. According to the stakeholder responses (Figure 57, Figure 58) the following conclusion is derived:

- From the aspect of administrative capability PM2 and PM3 require additional consideration.

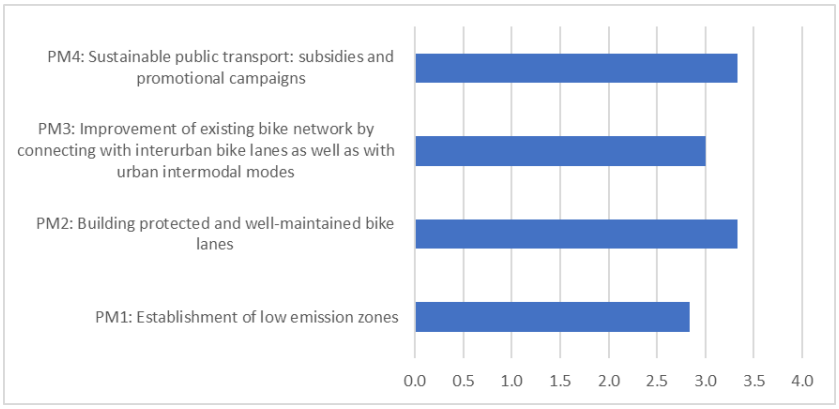


Figure 57. Assessment of policy measures against the political feasibility dimension: Administrative operability

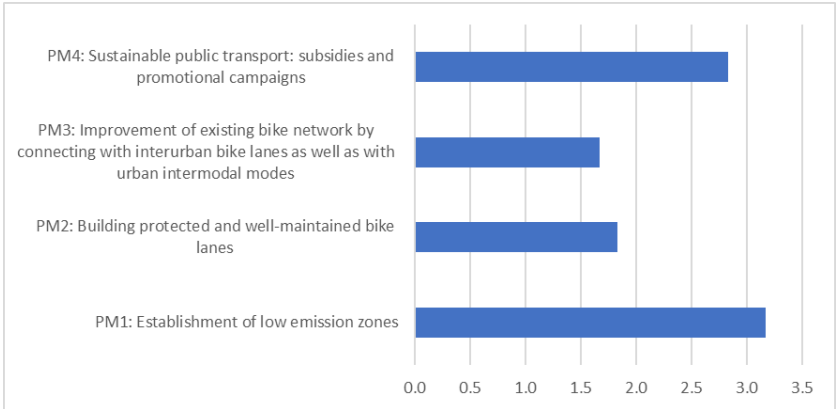


Figure 58. Assessment of policy measures against the political feasibility dimension: Administrative capability

Use case 2

Implementation feasibility: First stage

Technical feasibility dimension aims at assessing the pool of resources that each of the alternative policy responses requires.

According to the opinion of the involved stakeholders, all the policy measures are feasible (Figure 59)

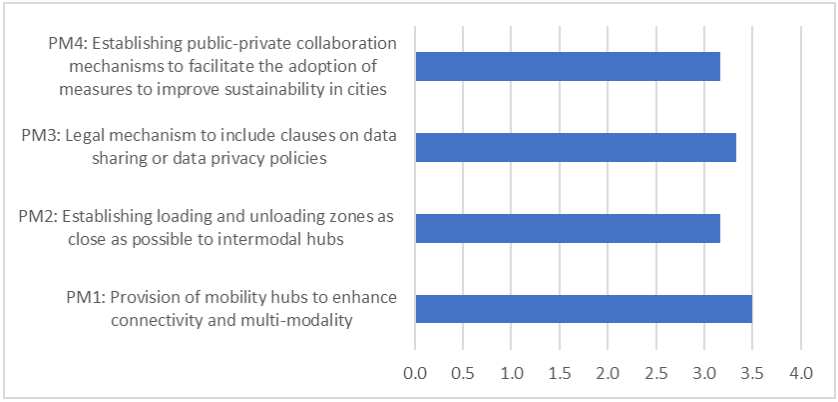


Figure 59. Assessment of policy measures against the technical feasibility dimension

In order to assess potential risks as well as the risk mitigation strategies for the implementation of PM1 from the technical feasibility aspect a round table will be organized.

Financial feasibility includes evaluation of following cost categories: direct costs, indirect costs, fixed costs as well as operations and maintenance costs; as well as the selected benefit categories: direct and indirect benefits.

According to respondent opinions (Figure 60-Figure 65), only PM4 is unfeasible for indirect, fixed and operation and maintenance costs categories. PM2 and PM3 are very closed to the unfeasibility threshold for the same cost categories as PM4.

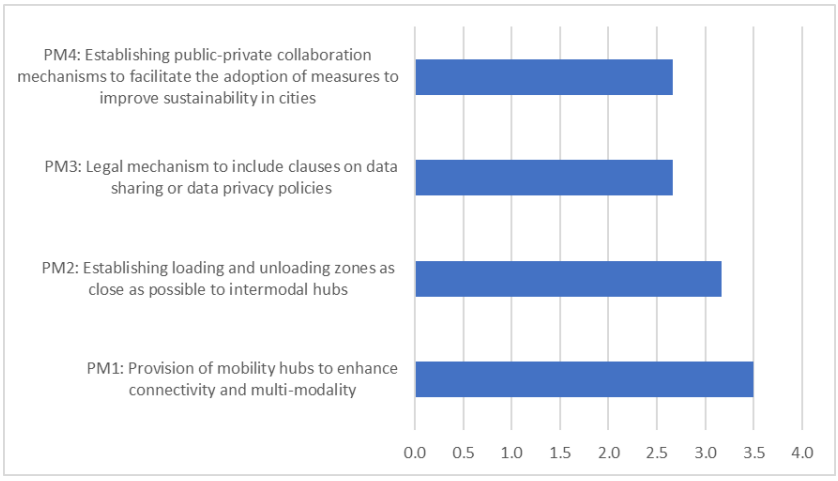


Figure 60. Assessment of policy measures against the financial feasibility dimension: Direct costs

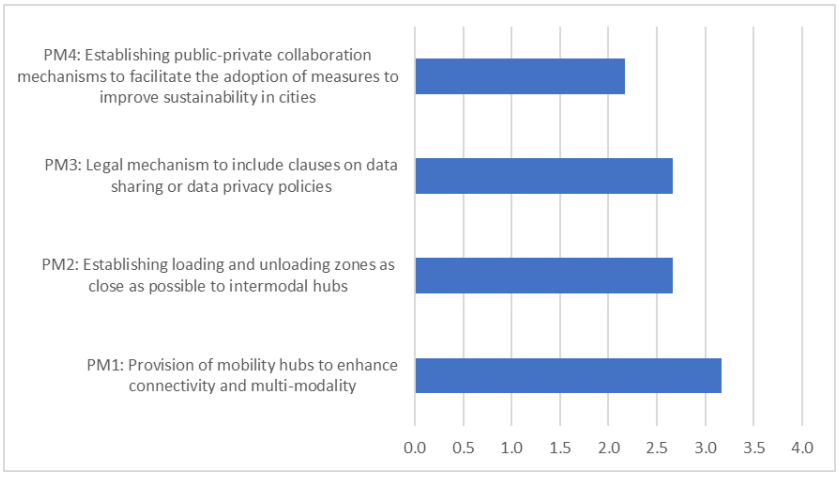


Figure 61. Assessment of policy measures against the financial feasibility dimension: Indirect costs

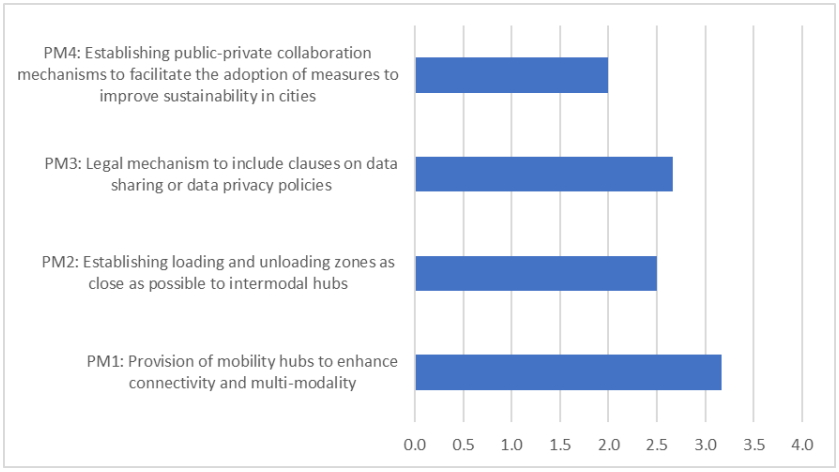


Figure 62. Assessment of policy measures against the financial feasibility dimension: Fixed costs

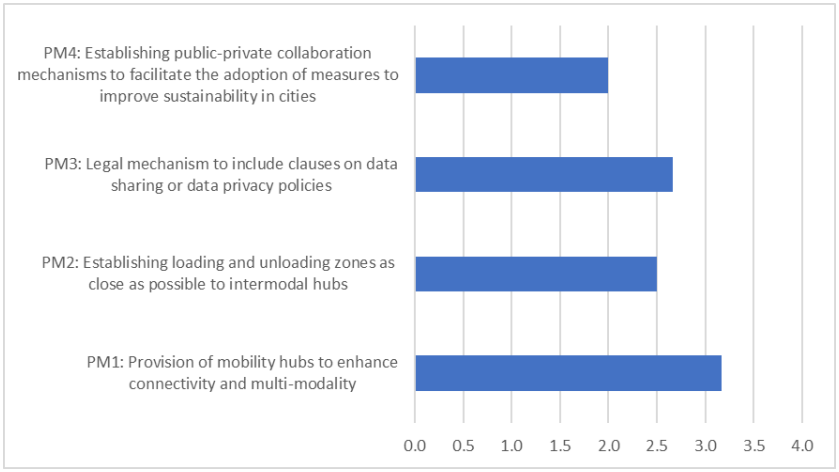


Figure 63. Assessment of policy measures against the financial feasibility dimension: Operations and maintenance costs

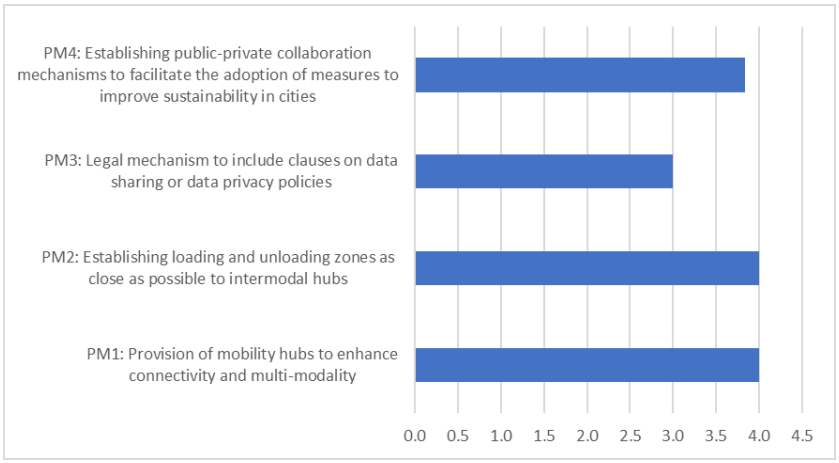


Figure 64. Assessment of policy measures against the financial feasibility dimension: Direct benefits

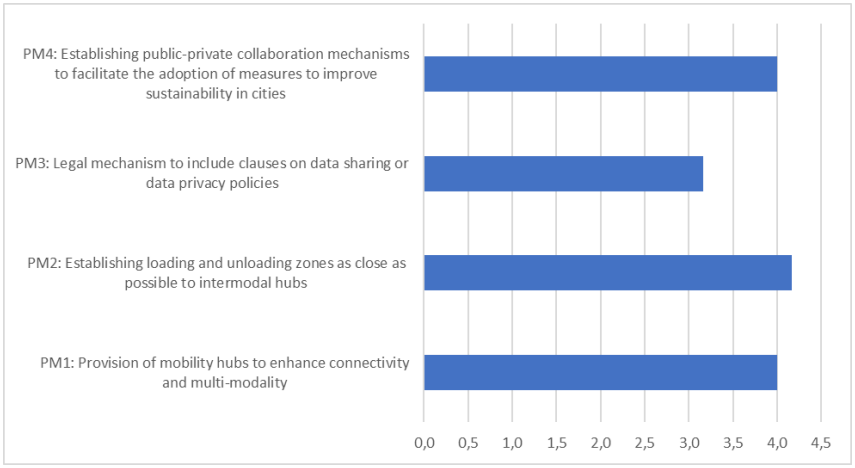


Figure 65. Assessment of policy measures against the financial feasibility dimension: Indirect benefits

Political feasibility includes evaluation of acceptability of alternative policy measures from the aspect of relevant stakeholders. From the results (Figure 66-Figure 69), we observe all the stakeholders participating in the survey considered the PM feasible for the political dimension.

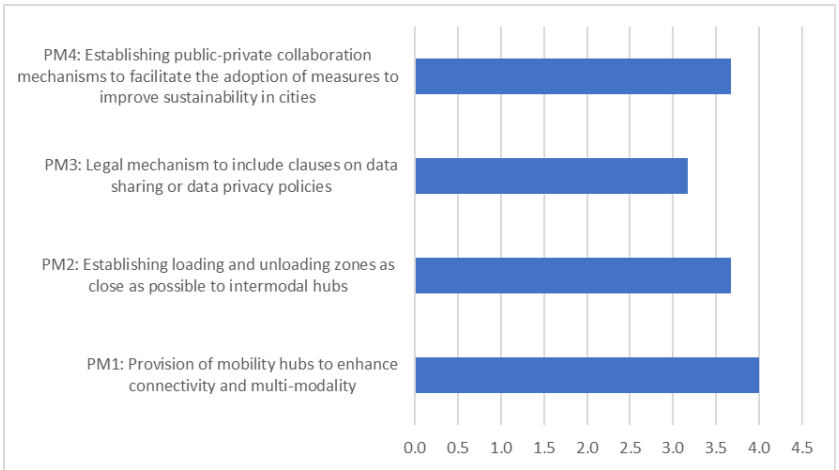


Figure 66. Acceptability of alternative policy measures from the aspect of Public Administration.

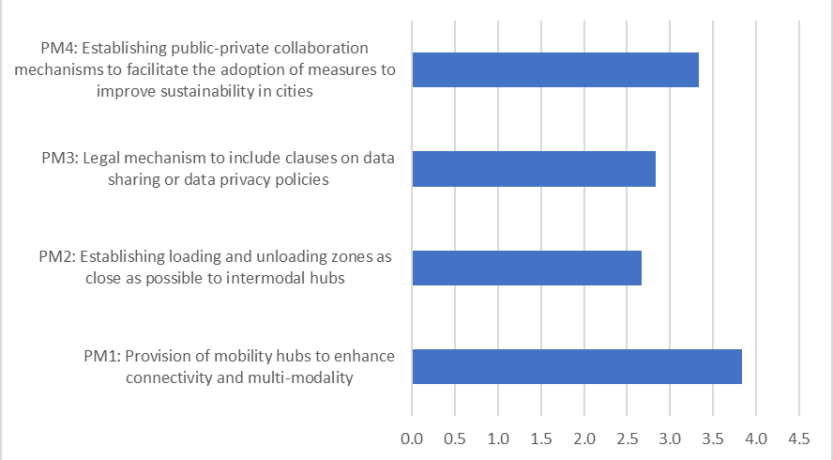


Figure 67. Acceptability of alternative policy measures from the aspect of Public transport operator.

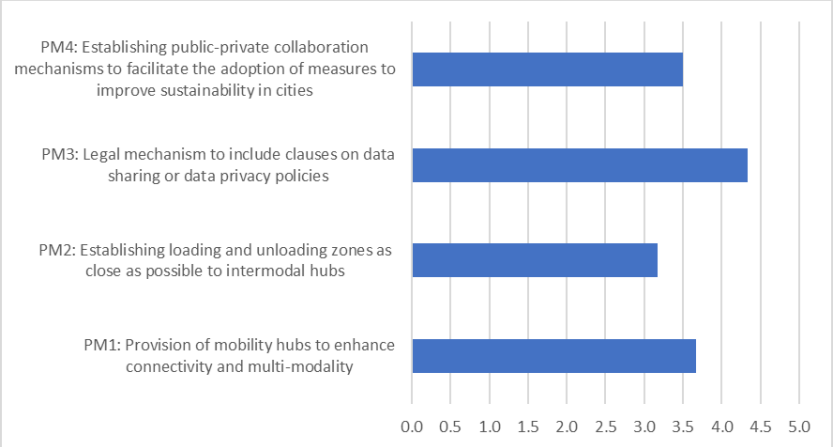


Figure 68. Acceptability of alternative policy measures from the aspect of Data/ Tech companies.

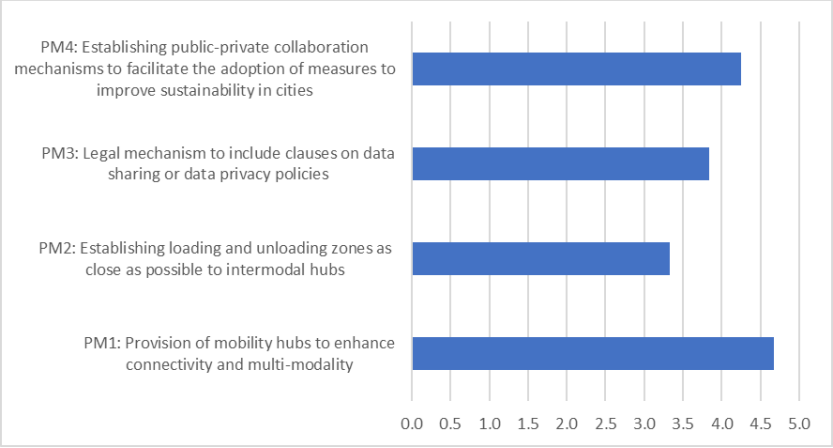


Figure 69. Acceptability of alternative policy measures from the aspect of New mobility service operator.

Administrative operability and capability are the main criteria for assessment of policy measures against the political feasibility. According to the stakeholder responses (Figure 70-Figure 71), the PMs are feasible for administrative operability and capability criteria.

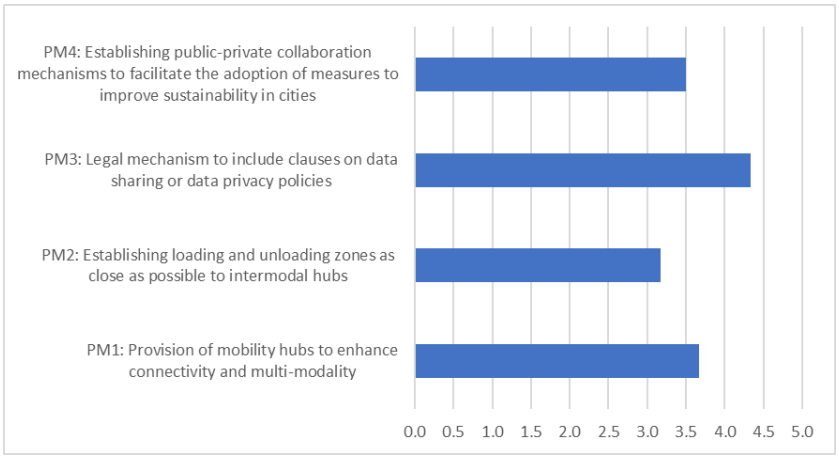


Figure 70. Assessment of policy measures against the political feasibility dimension: Administrative operability

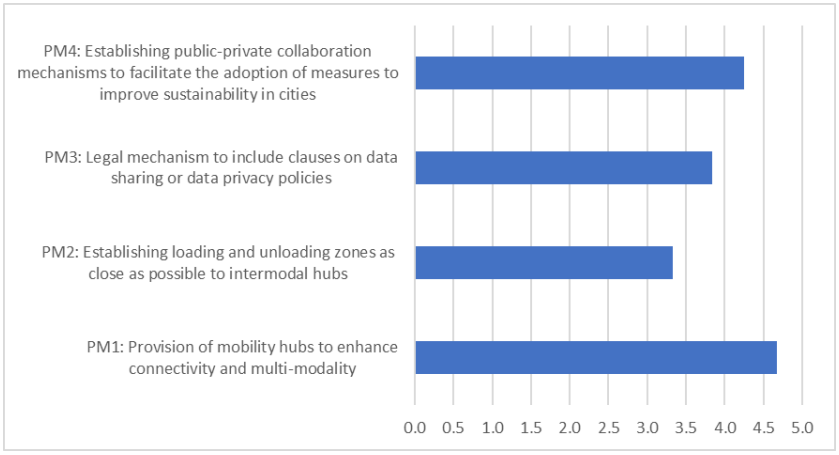


Figure 71. Assessment of policy measures against the political feasibility dimension: Administrative capability

Annex 9: T4.5 User acceptance

Use case 1

User acceptance: First stage

Criteria “Personal and social aims” is assessed by the extent a specific PM fulfills the needs of the respondents. According to the survey results (Figure 72) all PMs are fully reflecting the social and personal aims of the users.

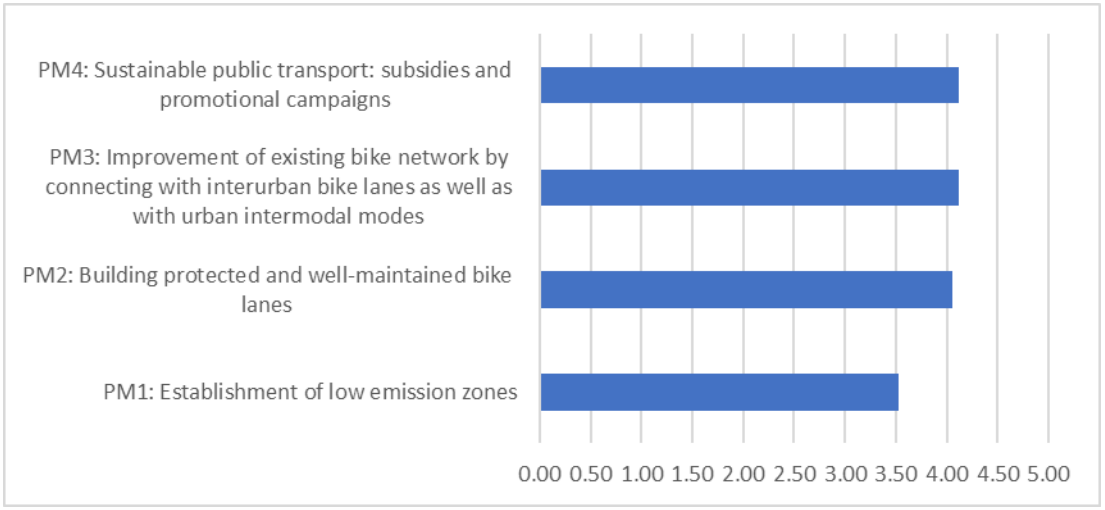


Figure 72. Use case 1: Assessment of policy measures against the user’ personal and social aims

High problem perception reflects an increased willingness to accept a specific policy measure. According to the survey results (Figure 73 - Figure 77) UC1 respondents have a good user’ perception of the urban mobility challenges.

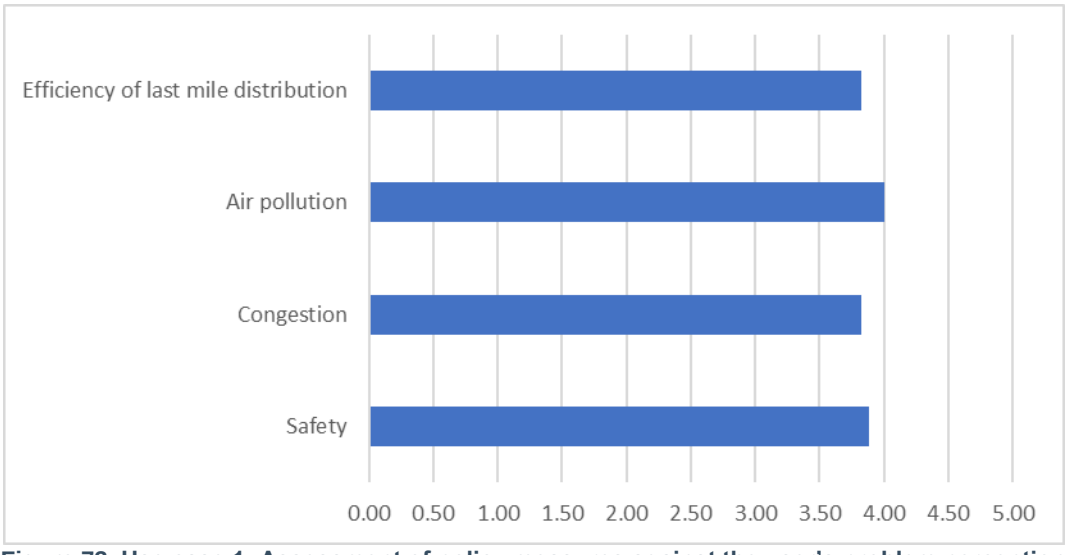


Figure 73. Use case 1: Assessment of policy measures against the user’s problem perception

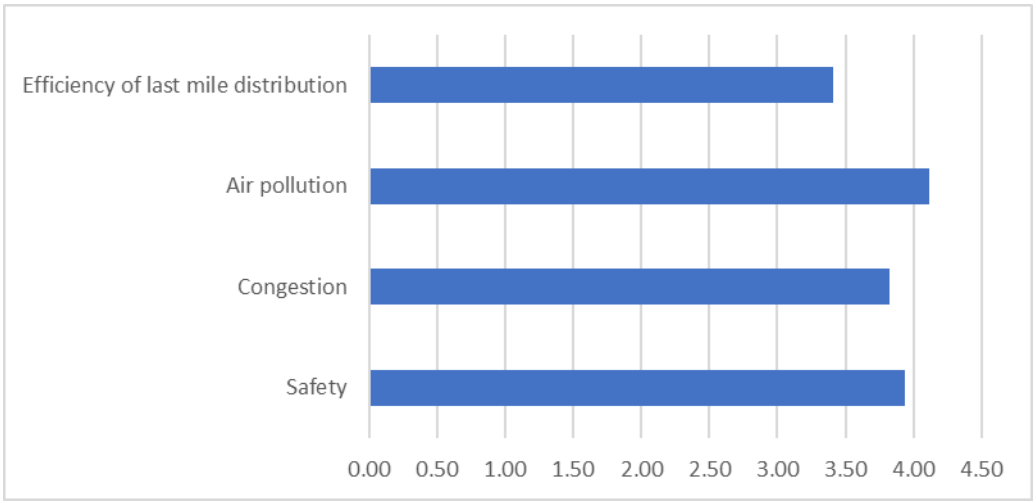


Figure 74. Use case 1: Assessment of policy measures against the user' problem awareness

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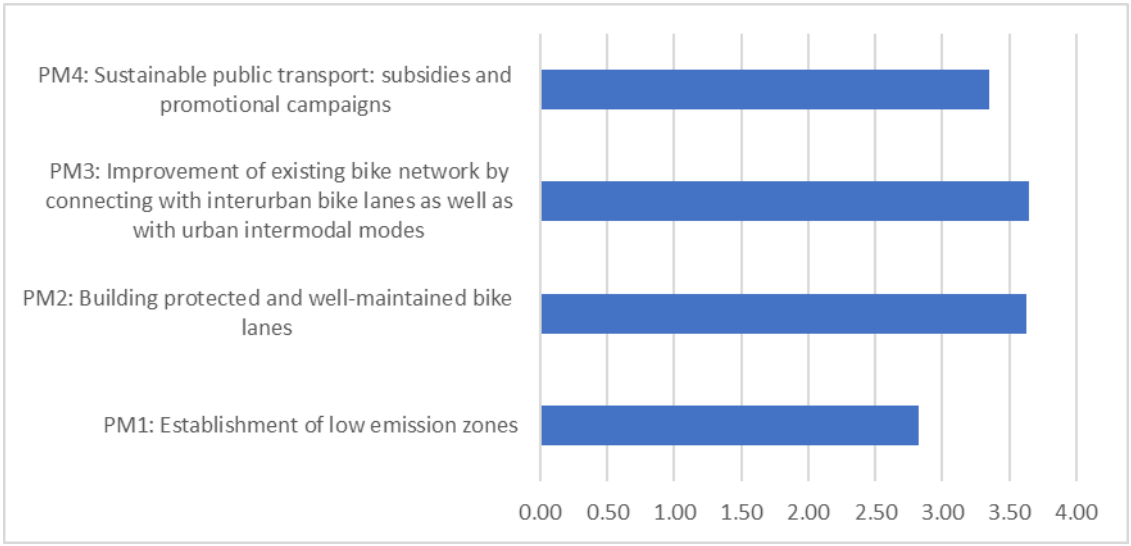

Figure 75. Use case 1: Assessment of policy measures against the user' awareness about policy measure

User' satisfaction with proposed solution, policy measure in this case, reflect the degree by which the policy measure solves the users' needs. According to the survey results the users are satisfied with proposed policy measures.

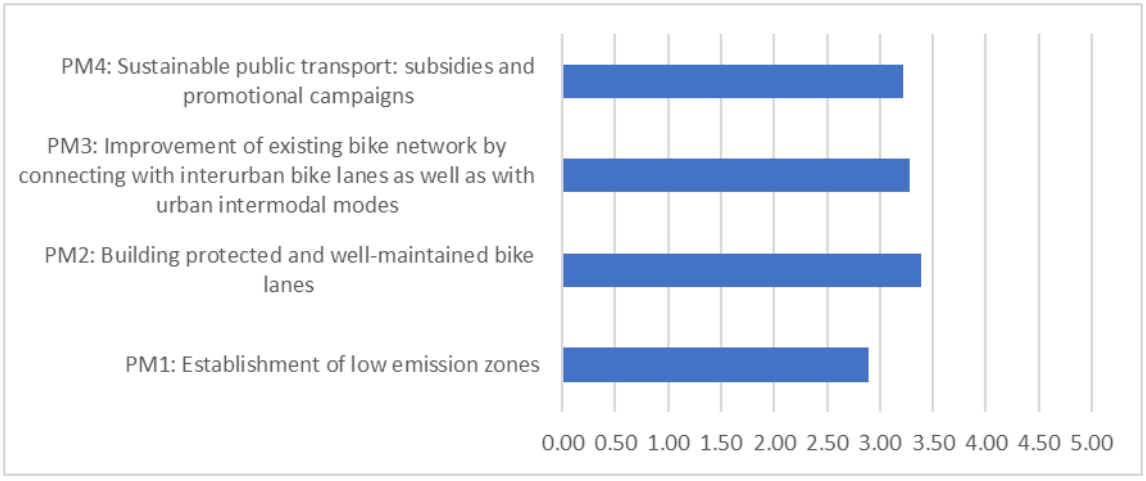

Figure 76. Use case 1: Assessment of policy measures against the user' satisfaction with a policy measure.

Affordability of the policy measures from user perspective is also one of the determinants of the success of a specific policy measure. Based on its socio-economic status the users express their preference towards a specific policy measure. The survey results show that all PMs are considered affordable.

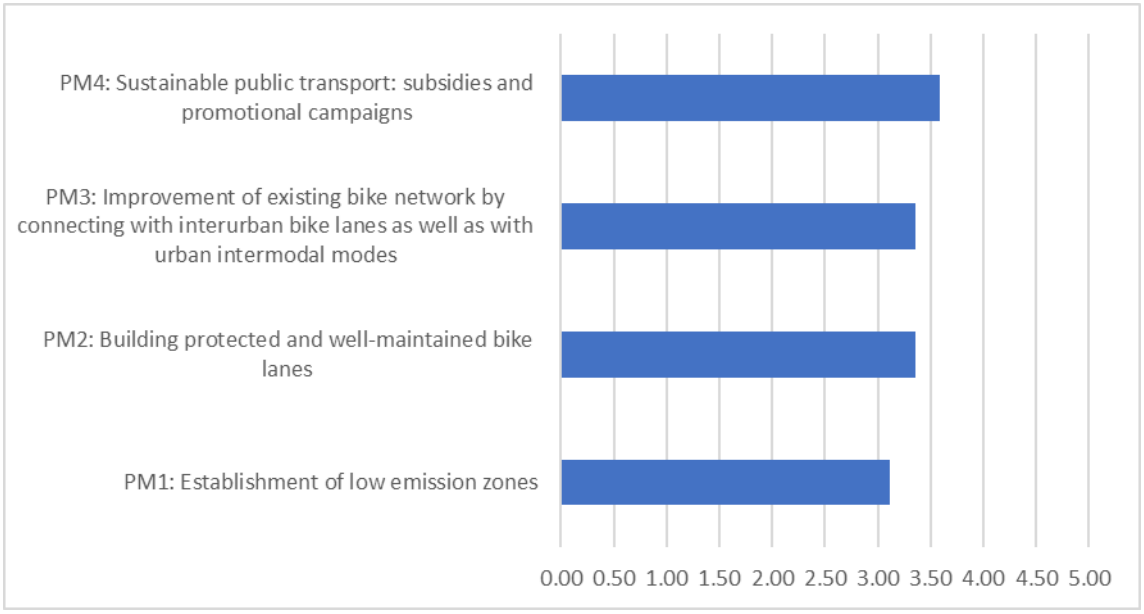

Figure 77. Use case 1: Assessment of policy measures against the users' affordability of policy measures.

Use case 2

User acceptance: First stage

Criteria "Personal and social aims" is assessed by the extent a specific PM fulfills the needs of the respondents. According to the survey results (Figure 78) all PMs are fully reflecting the social and personal aims of the users.

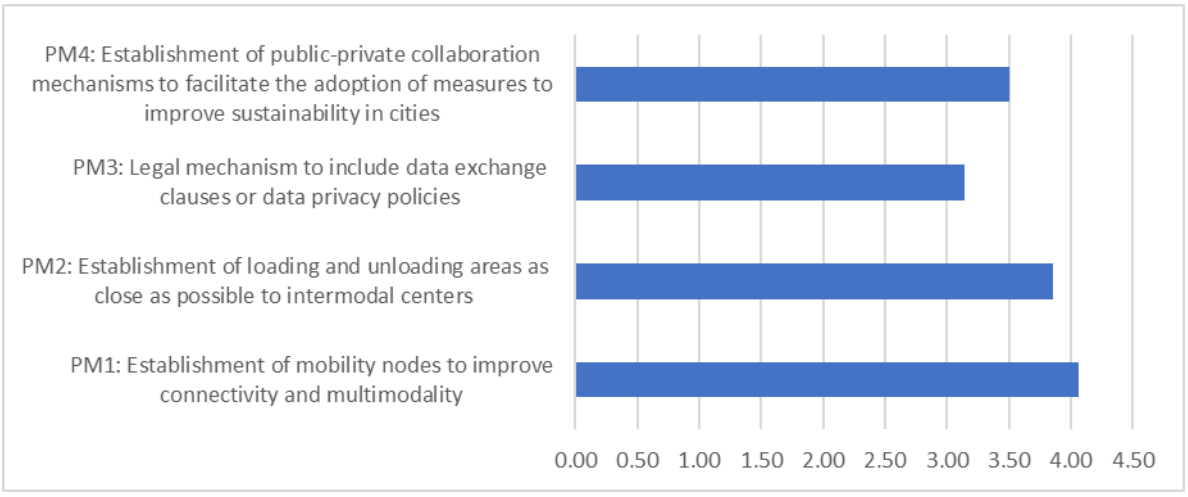

Figure 78. Use case 2: Assessment of policy measures against the user' personal and social aims

High problem perception reflects an increased willingness to accept a specific policy measure. According to the survey results (Figure 78 -Figure 83) UC1 respondents have a good user'

perception of the urban mobility challenges. However, they do not understand how PM3 and PM4 may help solve the identified problems in their environment.

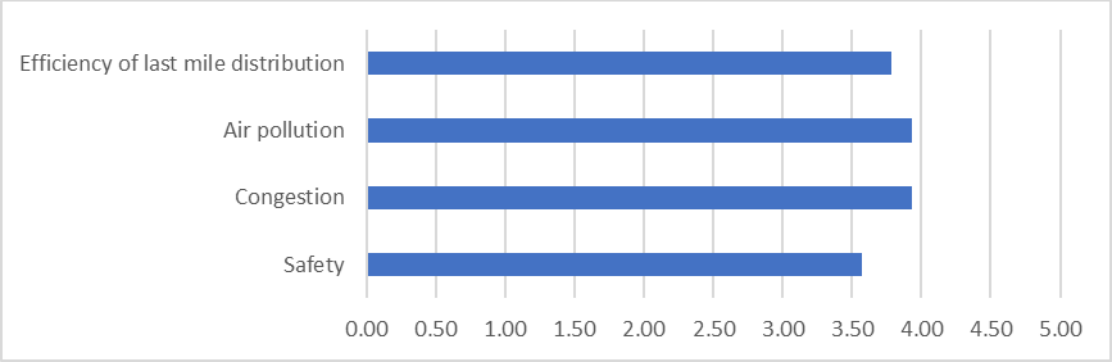

Figure 79. Use case 2: Assessment of policy measures against the user's problem perception

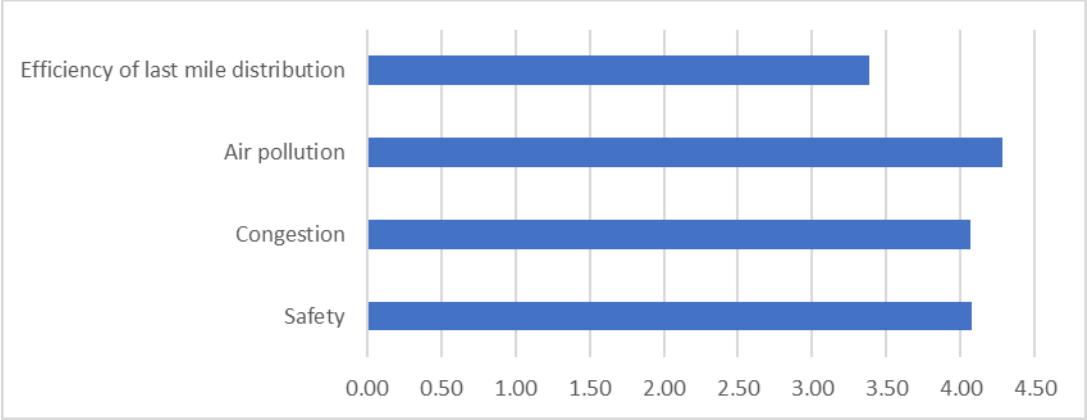

Figure 80. Use case 2: Assessment of policy measures against the user' problem awareness

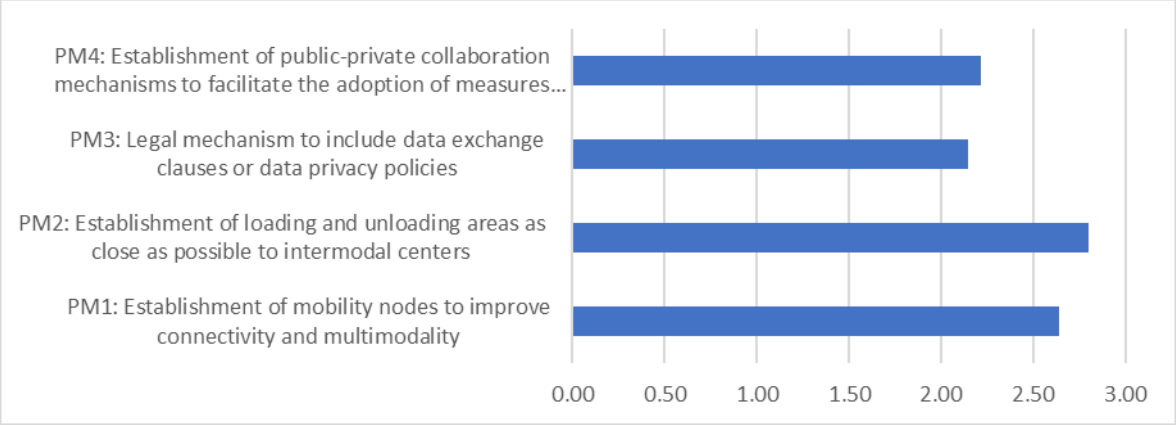

Figure 81. Use case 2: Assessment of policy measures against the user' awareness about policy measure

User' satisfaction with proposed solution, policy measure in this case, reflect the degree by which the policy measure solves the users' needs. According to the survey results the users are satisfied with proposed policy measures.

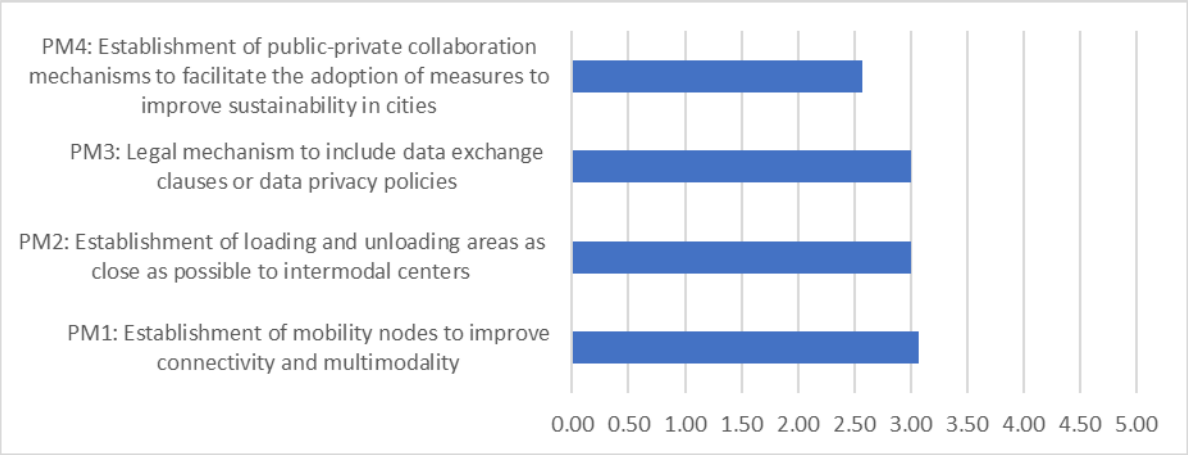

Figure 82. Use case 2: Assessment of policy measures against the user' satisfaction with a policy measure.

Affordability of the policy measures from user perspective is also one of the determinants of the success of a specific policy measure. Based on its socio-economic status the users express their preference towards a specific policy measure. The survey results show that all PMs are considered affordable.

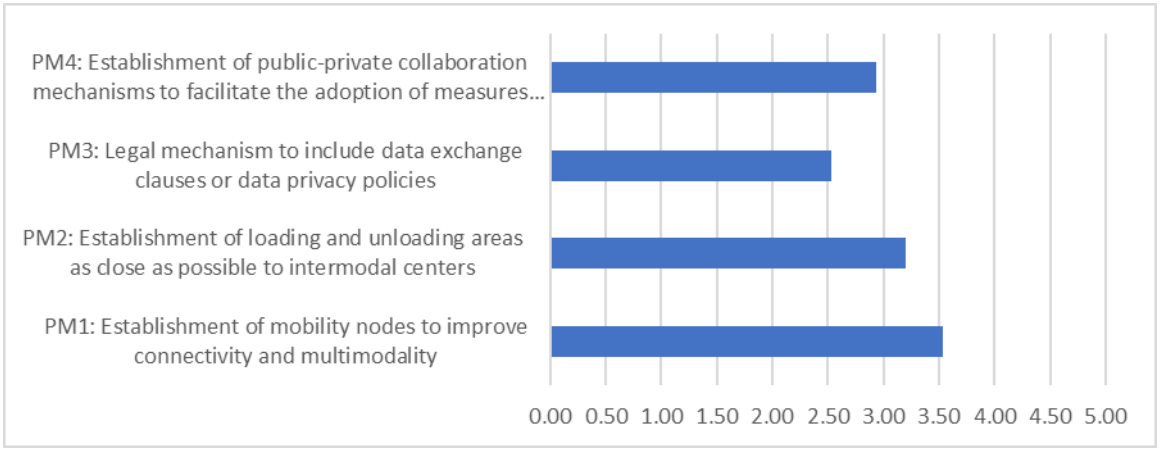

Figure 83. Use case 2: Assessment of policy measures against the users' affordability of policy measures