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CIVITAS
Cleaner and better transport in cities

DESTINATIONS



D4.3

Demonstration report on shared mobility, e-infrastructures and supporting technologies

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Abstract

This deliverable reports the results of the activities performed by the six DESTINATIONS sites under Tasks 4.4, 4.5 and 4.6 of WP4 “*Shared mobility and e-infrastructures towards zero emissions transport*”. The deliverable, beyond describing the results of each site, synthesises the cross analysis carried out on the demonstration of the shared mobility and e-infrastructures measures. Key achievements, main challenges, lessons learnt and recommendations to successfully transfer the implemented measures to other cities are also highlighted.

Project Partners

| Organisation | Abbreviation | Country |
|--|--------------|---------|
| Horários do Funchal, Transportes Públicos, SA | HF | PT |
| Agência Regional da Energia e Ambiente da Região Autónoma da Madeira | AREAM | PT |
| Câmara Municipal do Funchal | CMF | PT |
| Secretaria Regional da Economia Turismo e Cultura | SRETC | PT |
| Agência Regional para o Desenvolvimento da Investigação, Tecnologia e Inovação | ARDITI | PT |
| Limassol Tourism Development and Promotion Company Ltd | LTC | CY |
| Municipality of Limassol | LIMA | CY |
| Stratagem Energy Ltd | STRATA | CY |
| Dimos Rethimnis | RETH | EL |
| The Research Committee of the Technical University of Crete | TUC | EL |
| Comune Di Rio | Rio | IT |
| Comune Di Portoferraio | PF | IT |
| MemEx S.R.L. | MEMEX | IT |
| Authority for Transport in Malta | TM | MT |
| Valletta Kunsilli Lokali – Valletta Local Council | VLC | MT |
| Universita ta' Malta | UoM | MT |
| Ministry of Tourism | MOT | MT |
| Guaguas Municipales Sociedad Anonima | Guaguas | ES |
| CINESI S.L consultoria de transport | CINESI | ES |
| Ayuntamiento de Las Palmas de Gran Canaria | LPGC | ES |
| Ingeniería Electrónica Canaria S.L | INELCAN | ES |
| Sociedad Municipal de Aparcamientos de Las Palmas de Gran Canaria | SAGULPA | ES |
| Istituto di Studi per l'Integrazione dei Sistemi | ISINNOVA | IT |

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| European Integrated Project | EIP | RO |
| Sustainable Services | GV21 | ES |
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| Conférence des Régions Périphériques Maritimes d'Europe | CPMR | BE |

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Glossary

| | |
|---------------|---|
| ICT | Information Communication Technology |
| MaaS | Mobility-as-a-Service, consists in the integration of different mobility services (and information and payment tools) specially for urban and metropolitan areas as a co-operative and interconnected ecosystem reflecting the needs of customers |
| PT | Public Transport |
| P2P | Peer-to-peer services |
| PTA | Public Transport Authority Organisation/Entity (Local/Intermediate level, Mobility Agency, etc.) contracting the PT service operation. |
| PTO | Public Transport Operator Company operating PT services |
| RIDE SHARING | Mobility services (i.e. bus, car-pooling, collective taxi, Uber, Lyft, etc.) allowing to share the same trip/ride |
| ASSET SHARING | Mobility services allowing the sharing of the same vehicle (i.e. bike/car/scooter, etc.) among different users |
| SUMA | Shared Use Mobility Agency based on an advanced platform for providing different mobility services, in particular asset and ride sharing scheme and notice board trip booking |
| TNC | Transport Network Companies |
| BM | Business Model |
| PPP | Private Public Partnership |
| EMW | European Mobility Week |

Executive Summary

The results of the activities carried out by the CIVITAS DESTINATIONS sites under WP4 “*Shared mobility and e-infrastructures towards zero emissions transport*”, Task 4.4 “*Demonstrations of Shared Mobility Services*”, Task 4.5 “*Demonstrations of new extended public (e)bike systems*” and Task 4.6 “*Demonstrations of shared e-charging infrastructures*” are presented in this report. The different task measures have been classified in three specific clusters:

- **Shared mobility services**, including measures related to the implementation of an advanced IT platform for managing ride sharing schemes in Elba
- **New and extended (e)bike systems**, including asset sharing measures implemented in Limassol, Malta, Rethymno and Las Palmas
- **Shared e-charging infrastructure**, including implementation and e-mobility awareness campaign in Madeira, Limassol, Elba, Rethymno and Las Palmas

Beside the description of the main results achieved in these clusters, this deliverable outlines the main barriers, drivers, key lessons, similarities, and differences among the sites in order to draw some recommendations for other European cities and CIVITAS community.

One of the key aspects emerging from the first two clusters cross analysis is the importance and popularity of shared (asset and ride) mobility services and e-mobility gained in the last years in all the DESTINATIONS sites. They are in fact more and more considered as a relevant component of the overall mobility system and/or as complementary to PT services. Moreover, the role of Local City Government is fundamental for the development of these services through regulation of support conditions and organisation aspects. Finally, the role of the different shared mobility schemes (P2P, free floating, notice board, hitchhiking, etc.) towards the different user groups (residents, tourists, user groups, etc.) has been identified with the related impacts on the markets and financial aspects.

The experience of the DESTINATIONS sites outlines in the third cluster the importance of City Government in pushing a local broad-scale adoption of electric vehicles and the implementation of the e-charging infrastructure in an attempt to solve the well-known dispute on the scarce diffusion of electric vehicles (EVs): “*is it due to the lack of a spread recharging points network or is the scarce availability of re-charging devices due to the limited the diffusion of EVs?*”. It also identifies the factors influencing the growth of the market locally. It was observed that it is far from being rapid and notable due to several challenges to overcome, the most impacting being the higher cost of e-vehicles, the high cost for dedicated energy supply infrastructure and the need to reinforce and upgrade the local technology (e.g. local grids) to prepare for the integration of EVs in the energy chain.

The above considerations have been drafted before the COVID-19 crisis that will impact strongly in the next months on the PT services and shared services with the risk to increase another time the role of the private cars due the social distancing and other constraints.

In this context, the cluster experience of the DESTINATIONS sites on the different shared services management and on the e-mobility and active modalities could be a base factor for defining and developing alternative and clean options to the use of the car based on various forms of sharing systems (bike, ride, asset, e-scooter, e-bike etc.), integrated with public transport and pedestrian modality.

1 Introduction

1.1 Overall DESTINATIONS Objectives

The CIVITAS DESTINATIONS project developed a set of innovative and integrated packages of smart mobility solutions in six European urban laboratories, combining newly emerging technologies, policy-based and soft measures with a strong replication potential. The six involved sites are insular cities and very popular tourist destinations facing a high touristic demand; they all have different size and characteristics and are represented by: Funchal, Madeira (Portugal), Las Palmas de Gran Canaria (Spain), Limassol (Cyprus), La Valetta (Malta), Elba (Italy) and Rethymno (Greece). Through the development of measures in the main sectors of car-independent lifestyle, clean fuels and vehicles, collective and flexible public transport, demand management, integrated sustainable mobility plan, innovative crowdsourcing and user involvement tools, intelligent transport systems for access control, urban freight distribution and city logistics, the DESTINATIONS project aims to achieve more sustainable mobility for residents and tourists and to contribute to the mitigation of climate change, in particular by:

- reducing emissions / improving air quality
- reducing energy consumption
- improving overall urban accessibility
- enhancing social cohesion
- improving cost effectiveness of transport services
- enhancing attractiveness of tourist destinations

1.2 WP4 Objectives

The activities in WP4, in the six DESTINATIONS sites, have been focused on the design, development, implementation and demonstration of mobility services based on the concept of **ride/asset sharing schemes and support conditions/measures for increasing collective and clean travel and mobility service accessibility for residents and tourists**.

The WP4 measures implemented include various ride/asset sharing schemes, advanced IT platforms/portals, electric vehicles (EV), incentives and infrastructure to improve the attractiveness of the sites and reduce the traffic congestion specially during the summer period.

In particular, WP4 activities involved the design, implementation and demonstration of:

- An ICT-enabled platform for ride sharing services integrated with conventional public transport and targeted at different residents' and tourists' needs. This platform implemented in Elba has different components (mobility operators networking, notice board for sharing the ride, open data layer, etc.).
- New or upgraded bike-sharing services including the use of e-bikes and bikes for physically impaired users in Las Palmas and Rethymno; expansion of public bike-sharing services in Limassol and Rethymno; information and awareness campaign to promote sharing mobility modes and safe cycling and driving in Malta and Rethymno.

- Take-up of electric mobility based on the launch or increase of charging stations and various promotional measures, (Madeira, Rethymno, Las Palmas and Limassol); the analysis and set up of specific regulations for fostering the use of EV and PHEV (Elba).

WP4 was composed of eight main tasks to achieve the main above objectives:

- Task 4.1: Cross-site coordination of shared mobility and e-infrastructure
- Task 4.2: User-needs analysis, stakeholder involvement, service requirements and supporting technology design for shared mobility and e-infrastructures
- Task 4.3: Site preparation, solutions deployment, supporting actions and demonstration setup for shared mobility and e-infrastructures piloting
- Task 4.4: Demonstrations of shared mobility services
- Task 4.5: Demonstrations of new/extended public (e-)bike systems
- Task 4.6: Demonstrations of shared e-charging infrastructures
- Task 4.7: Data collection for ex-post, process and impact evaluation for shared mobility and e-infrastructures piloting
- Task 4.8: Local dissemination and communication for shared mobility and e-infrastructure piloting

The focus of this deliverable is the description of results obtained within Tasks 4.4, 4.5 and 4.6.

1.3 WP4 Clusters

The measures, developed under the WP4 related tasks, are aggregated into three main clusters:

- a) **Shared mobility services**, including measures related to the implementation of a platform for ride sharing schemes in Elba (ELB):
 - **ELB 4.1** ELBA Sharing Mobility Agency, **ELB 4.2** Car/scooter (moto)/bike/boat (CSBB) sharing, **ELB 4.3** Ride Sharing Platform, **ELB 4.4** Increasing feeling of security among Elba sharing users tracking for ELBA-sharing service users: app. These measures were realised under the concept of the “**Shared Use Mobility Agency (SUMA)**” an organisational-operational structure, based on an ICT-platform and related web Portal and APP. SUMA aims to coordinate and manage different ride/asset sharing services integrated with conventional public transport services and mobility user information.
- b) **New and extended (e)bike systems**, including asset sharing measures implemented in Las Palmas de Gran Canaria (LPA), Limassol (LIM), Malta (MAL) and Rethymno (RETH):
 - **LIM 4.2 Extension of public bike sharing system.** This measure concerns the extension of bike sharing network, adding new bike stations and increasing the number of available bikes.
 - **MAL 4.1 Promoting e-bike and car sharing service.** This measure concerns the realisation of an information and awareness campaign to promote both the services of e-bike and car sharing as well as educate the public on cycling safety.
 - **RETH 4.2 Building a sharing mobility culture – Sharing Mobility Campaign.** This measure concerns the realisation of the first dockless e-bike sharing system in Greece, the

launch of a new e-scooter sharing system as well as a large-scale campaign to promote sharing mobility modes and safe driving for e-scooters.

- **LPA 4.1 Public e-bike system.** This measure concerns the introduction of a new bike sharing service, including bike models/structure usable/accessible by impaired users.

c) **Shared e-charging infrastructure** as following:

- **MAD 4.1** Promote the uptake of clean vehicles by fleet operators. This measure concerns the **expansion of the charging network**, the development of an **information platform on electric mobility and the promotion of incentive schemes** to purchase e-vehicles in Funchal and Madeira sites.

- **LIM 4.1** Electric car rental connecting Limassol inner centre with the airport and port. This measure concerns the implementation of **EV charger stations including shelters for car parking**.

- **LIM 4.3** Promote the uptake of electric vehicles, campaign on e-mobility. This measure concerns the realisation of an **information and awareness campaign** to promote the use of e-vehicles in Limassol.

- **ELB 4.5** definition of **specific regulation for the EV circulation/parking** and for charging station installation on the overall Elba network. The main objective of the defined regulation framework is to foster the use of clean vehicles and the correct installation/management of EV charging stations around the island.

- **RETH 4.1** Uptake of electric vehicles by fleet operators. This measure concerns the **installation of the first public EV charging points** in the Crete region and the promotion of incentives for EV use in Rethymno.

- **LPA 4.2** Fast charging EVs in Las Palmas site. This measure concerns the realisation of **new fast recharging points for E-vehicles**.

Based on these three clusters, a cross analysis of each demonstrated measure has been carried out to extract not only some common lessons but also recommendations on the different aspects related to the Local Administration (the key actors of the CIVITAS DESTINATIONS project). In this context, the coordination action carried out by MemEx and Portoferraio allowed to facilitate experience and knowledge exchange among the six sites interested partners and to create a common understanding of the role and impacts of the innovation (from the ICT platform and APP design and implementation, to the smart promotional campaign, definition of support conditions, identification of regulatory framework, etc.) vs transport services (ride/asset sharing, public transport schemes, etc.) and infrastructure (EV charging stations, e-vehicles, e-bus, etc.).

1.4 Deliverable D4.3 role

This report describes the results of the WP4 demonstration of measures in each of the six sites following the cluster subdivision and the task activities (T4.4, T4.5, T4.6) carried out.

The main objective of the deliverable is not only to describe **the key achievements** and results achieved but also to **outline the main challenges, problems and impacts** faced during the implementation of these measures. Detailed information about specific lessons learnt and critical factors/issues faced and/or solved are described in each measure description.

Measures within the three clusters have been cross-analysed in order to underline common successes and failures, to draw recommendations on how to successfully transfer the implemented measures to other cities and to provide specific conclusions for interested stakeholders and the CIVITAS community.

2 Shared mobility services

2.1 ELBA - ELB 4.1, 4.2, 4.3, 4.4 RIDE SHARING Mobility Services

The Shared Use Mobility Agency (SUMA) is one of the most innovative measures developed in DESTINATIONS project, specifically in ELBA island.

SUMA was designed around a specific ICT platform for planning, booking, coordinating, and controlling different ride sharing services integrated with conventional public transport. With SUMA, on one side, the users can get all information on the mobility services active in Elba island through the cooperation and networking among the transport service providers and, on the other side, SUMA allows the users to become potential mobility service providers of shared trips.

The key component of SUMA is the **notice board** allowing users to share rides (trip request and offer). All functionalities and components of the Elba Shared Mobility Agency have been fully detailed and described in the booklet "*Shared Use Mobility Agency in Elba: from the concept to the IT platform*" (English version) published by MemEx on 2019. All the technical documents produced for the procurement/call for tender process and for the implementation phase are also available in Italian language (full version) with synthesis in English.

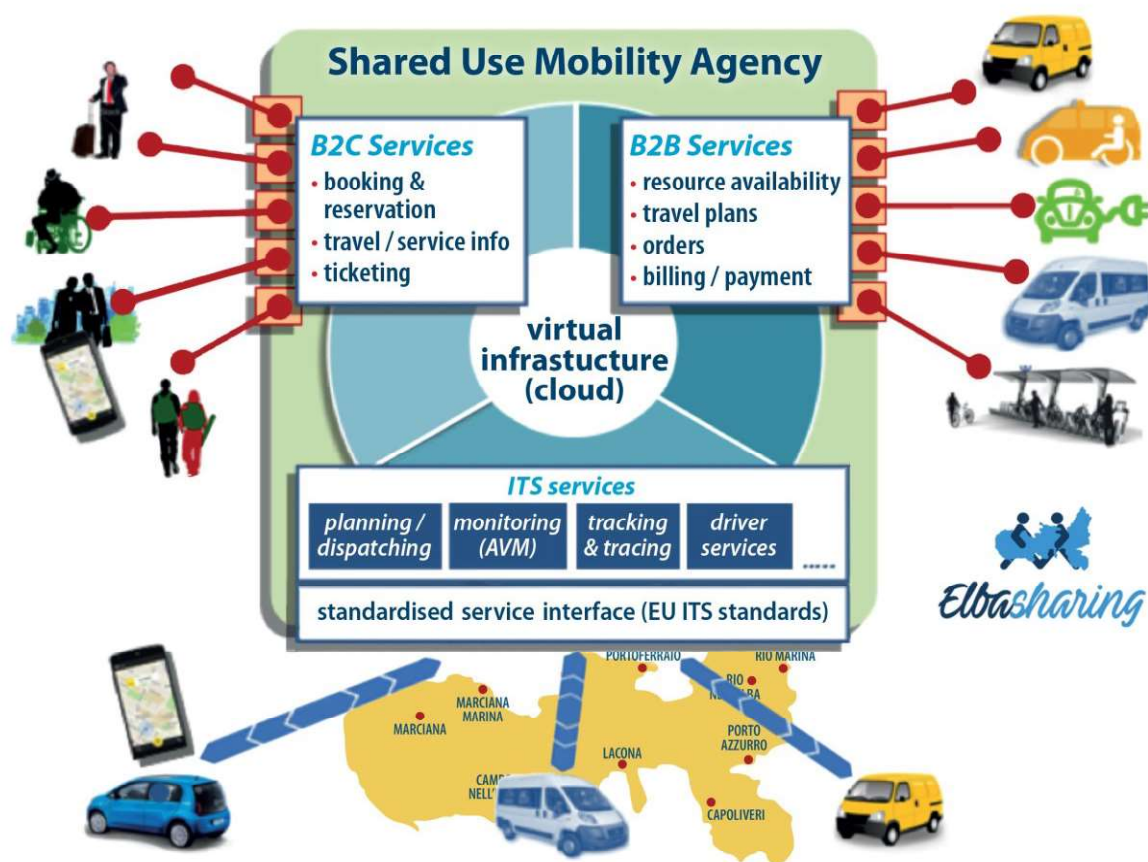


Figure 1 - Elba Shared Use Mobility Agency (SUMA)

The innovative aspects of SUMA can be summarised as follows:

- the Agency works on three interrelated levels (collective transport, ride sharing services and connected mobility systems) in order to provide on-demand and shared services to the different citizens, users groups and/or in low demand areas.
- the Agency provides B2C services allowing the coordination/interaction of the different mobility stakeholder and operators acting on Elba Island.
- the Agency can be easily adapted to a wide range of transport service schemes, territorial contexts and background conditions. **It is not limited to transport and mobility services, but also potentially open to a wider range of other added-value tourist services.**

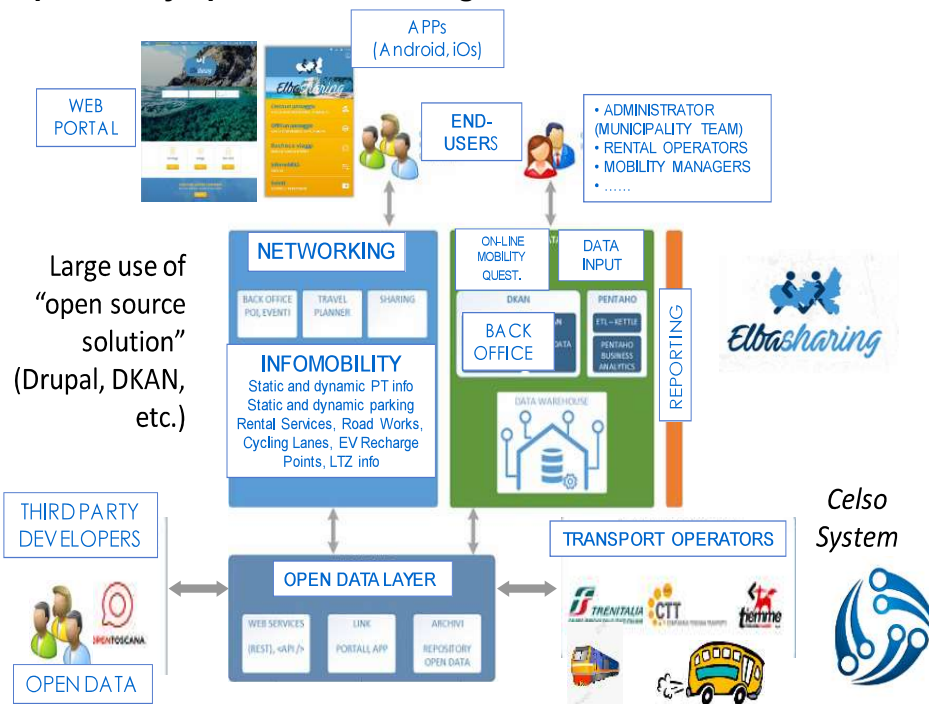


Figure 2 - Shared Use Mobility Platform: IT architecture

The first developed demo version of the SUMA platform and related mobile application is currently (April 2020) being tested by the Elba DESTINATIONS team in order to understand the level of operation and acceptance by the market. Several issues and problems have emerged during the implementation phase, although the design of the ICT platform (functions, components, architecture) was very detailed and defined on the basis of a large set of different use cases. Despite presenting a high level of reliable and qualified references, the appointed technological/software provider has come across many difficulties mainly due to temporary internal organisational drawbacks. This postponed the sign-off of the platform although different versions of the APP have been realised and tested by the Elba DESTINATIONS team following specific testing procedures defined by MemEx, that is acting as supervisor and technical interface between the software provider and the two involved Municipalities.

Many Elba residents have participated in three open meetings and workshops with the local Authority (organised under WP2 activities of CIVITAS DESTINATIONS). Their participation mainly aimed to understand and contribute to the urban sustainable mobility plan and to the SUMA concept, objectives and case studies providing some comments and considerations.

SUMA was moreover advertised in the local press, in ElbaSharing website (www.elbasharing.com) and through other different local web portals active on the Elba island.

In any case, some considerations have emerged from the SUMA implementation in Elba, such as the following ones:

- special attention should be paid in the *choice of ICT provider* that has to be properly qualified to carry out the implementation of a highly complex system. Therefore, specific requirements about the capability of the potential provider should be clearly defined in the procurement docs.
- public procurements require long time to be finalised (in average 9-12 months across Europe for a bid of more than 200K€), in particular for the bid evaluation process and subsequent negotiation and contract signature with the company selected as winner of the procurement. Thus, it can be argued that it would have been less time-consuming and simpler to implement the Agency directly within the DESTINATIONS project, involving from the beginning a qualified IT provider as consortium partner. Moreover, the direct participation/involvement in the DESTINATIONS project could have further motivated the IT partner in complying with the platform development commitments and timing.
- special attention should be paid to the *testing procedure* of the different platform versions and to set up an adequate organisation/management structure.
- close cooperation among Public Administrations, Mobility Agencies and Transport Operators is required to set the enabling framework for SUMA operation.
- the technical and functional specifications need to be tailored around the mobility demand and the specific territorial context through an active involvement of relevant stakeholders and citizens.
- preliminary evaluation about the need to develop a new platform or to work/use the existing one(s) is essential taking into account the presence of different existing Mobility services Portal, App and in some case TNC (Transport Network Companies).

Other important considerations concern the Business Model (BM) and funding scheme. A specific Business Model detailing the financial schemes and revenue aspects and identifying the operational structure and related responsibilities was defined and outlined during the first two years of DESTINATIONS. The last project period was more focused on the definition of a specific SUMA management structure. With the IT platform already developed (although not “published” on the market) the Portoferraio Municipality, supported by MemEx, is analysing which could be the most suitable management model and organization among the main options reported in the following table:

| Management Options | Approach |
|--|--|
| 1. Agency and IT platform entirely managed by the Municipality | The IT platform and the Agency structure are managed directly by the Municipality. The Municipality closely monitor the different mobility services without any intermediation. All the costs related to the organization, operation, dedicated staff, maintenance, and promotion of the services are under the responsibility of Municipality. All revenues are for the Municipality and are used to partially cover the costs. Municipality may experience difficulty in finding specialised staff for the IT platform management. |

| | |
|---|--|
| 2. Only Agency operation entrusted to an external company | <p>The IT platform, Agency physical structure already released by the Municipality (e.g. the case of Elba) are operated/managed by an external Company entrusted by procurement and related contract service. The Municipality should in any case appoint specific staff for controlling and evaluating the service contract performances.</p> <p>Operation and maintenance costs are covered by the budget of the procurement. The revenue should be attributed to the external company in order to stimulate the activities and promotion of the Agency</p> <p>The service procurement could present some difficulties such as the definition of the right budget and of the performance indicators and the possible long length of the procurement process.</p> |
| 3. Agency and IT platform managed entirely by an external company | <p>The whole Agency service (IT platform, management, promotion, etc) is entrusted to an external company by specific procurement process. The procurement therefore should be focused not only on the requirements of the Agency management but also on the requirements and functions of the IT platform. Specific KPIs should be defined for the IT platform and Agency management. The right procurement budget is not easy to be defined. The procurement process could be complex and not easy to be managed by the Municipality. In any case, specific staff is needed for controlling and monitoring the service contract. A possible option is to directly entrust the Agency service to a Municipal company without having to start a procurement process. The risk is the possible lack of competences of the assigned company.</p> |

Table 1 - Possible options for the management of the Shared Mobility Agency

All the above options should be defined with respect to European and National procurement law and requirements and needs of the Municipality. In Elba, the costs of the IT platform have been subsidised by the EU commission. For other towns or urban areas starting from scratch, these costs should be considered and could impact on the procurement constraints for the selection of the most adequate company.

2.2 “Shared mobility services” cluster analysis

The main focus of the cluster “Shared mobility services” was the design and development of the web platform in Elba (ELB4.1,4.2, 4.3 and 4.4) dedicated to plan, manage and coordinate different ride/asset sharing services. Elba, however, was not the only site of CIVITAS DESTINATIONS to develop a web platform. Rethymno, under measure RETH 6.1¹ dedicated efforts in the development of a Sustainable Mobility Agency to provide information on new quality services for tourists related to sustainable mobility and transport.

Despite having similar terms (“sharing”, “platform”, “Agency” etc.) and presenting the main general objective to decrease the car modal split rate in favour of active, collective and clean modalities, the two measures (or platform or Agency) present different functions, approach, application and provide different service schemes and typology.

In Rethymno, the Sustainable Mobility Agency is basically a user information platform to inform (mainly) tourists about the bike and scooter sharing systems available in the city that could be

¹ Further information is provided in the deliverable “D6.3 Demonstration Report for measures targeted to mobility demand management and increased awareness of sustainable mobility” of the CIVITAS DESTINATIONS project

used to visit the island. This platform is also oriented to promote the “culture” of shared mobility services in terms of “sharing” an “asset” like car, bike, e-bike and (e)scooter.

In Elba, instead, the “Shared Use Mobility Agency” is mainly focused to “share” the ride(s) among users through the notice board, to provide mobility information to the users (residents and tourists) and to integrate the mobility services with PT services. For this, the IT platform is realised around a unique data layer collecting and integrating data related to the different actors and mobility services active on the Elba Island.

The Shared Used Mobility Agency (SUMA) realisation was supported by Local Authorities (Elba Municipalities) since it helps in answering the dispersed and specific needs of residents and tourists not covered by the conventional PT bus service. SUMA can be considered as an essential component of the overall mobility system integrating the conventional PT service in order to reduce the use of the cars by tourists during their permanence in the island and supporting the greener hotels industry approach.

The SUMA concept is not strictly related to a specific territorial area such as an “island” nor small-medium size “urban areas”, but can be personalised also to cities and large towns. SUMA integrates different collective mobility services situated between the classic door to door “taxi” service and the conventional bus service (fixed route and time). SUMA can be also considered the first block of *Mobility as a Service (MaaS)* solution, based on the key role of ride sharing services with the possibility to be personalised on the requirements and characteristics of rural areas or small/large urban areas. SUMA also allows the integration of other relevant components of the mobility system (integration of data, payment tool, user information and feedbacks, service KPI validation and evaluation tools, etc.).

Moreover, the SUMA solution developed in Elba could act as reference experience for understanding if the realisation of alternative platform(s) for managing ride/asset sharing services, with respect to existing ones, is reasonable and advantageous in the current web application market dominated by the Transport Network Companies (TNC) and car companies.

In this context, the SUMA booklet, elaborated by MemEx to facilitate the transferability of SUMA concept, includes a series of practical guidelines and recommendations on design aspects, organisation and operation scenarios that could be useful for CIVITAS stakeholders, local Authorities and policy makers looking for a similar proved solution.

From the experiences of Elba and Rethymno, some key questions arise:

- at which level the Agency could be integrated with the PT services?
- which role should be given to the Local Authority in the Agency sign off and management?
- which level of involvement/partnership of private sector (mobility or tourism operators) is necessary?
- which level of common data provision and tools (web, app) integration is necessary among the different local actors and stakeholders?
- which “dimension” should the Agency present in terms of type, scale, and services with respect to the different areas and mobility service situation?

Specifically, in SUMP development, the policy-makers should consider the SUMA concept as **component of the overall mobility system** especially as a complementary and feeder part of PT services.

Another important aspect to be taken into account is that at the beginning of the implementation and official launch phase the support of the Local Authorities (municipalities) in terms of resources and preliminary organisation is necessary (SUMA initially was supported by the CIVITAS DESTINATIONS project). During the implementation phase, it is necessary to define a specific Business Model for managing the Agency after the sign-on. At the very beginning of the DESTINATIONS project, the Business Model was based on the hypothesis that a local start-up company could have the responsibility of the day to day management of the Agency (like in the option n°2 of Table 1). The start-up therefore should cover all the aspects (organisation, operation, professional staff, etc.) to operate this type of business. This option was taken into account at the beginning of CIVITAS DESTINATIONS supported also by the decision of the Municipality to acquire the IT platform by procurement process. During the IT platform realisation period this choice was indeed confirmed. Therefore, after the positive acceptance of the platform, Portoferraio Municipality will appoint a company through a specific procurement as indicated in option n°2 of table 1. The company could be a start-up but, in any case, should present the capability for carrying out the related work. The technical documents for this procurement was already defined by the Administration with a specific call for tender.

Two clear prerequisites should be taken into account for the possible success of the SUMA Agency:

- a. achievement of clear, effective and positive results (from the platform implementation and organisational aspects to the achieved “real number” of rides) during the testing phase (as carried out in DESTINATIONS)
- b. the ride/asset sharing services should have been planned as “support” and complementary mode of PT service and should be clearly defined in the SUMP

Finally, a synthesis of the overall aspects is reported in the following SWOT analysis applied to SUMA.

| STRENGTHS | WEAKNESSES |
|--|---|
| <ul style="list-style-type: none"> ▪ Mobility Integration in terms of information provision on mobility and PT services including sharing services. ▪ Demand aggregation. ▪ Interaction between mobility demand and service offer involving all the stakeholders and transport operator ▪ Provision of different services with respect the different typologies of “clients” (B2C, B2B, B2A) | <ul style="list-style-type: none"> ▪ Investment costs, in particular for the ICT platform realisation ▪ Operation costs planned for a medium and long term ▪ Uncertainty of the financial coverage of costs despite of the possible revenue generated by the commercial agreements with the networking operators |
| OPPORTUNITIES | THREATS |

| | |
|--|---|
| <ul style="list-style-type: none"> ▪ Mobility requirements and needs in evolution ▪ Behaviour change towards to the asset/ride sharing concept in the different transport modalities more than the property of car ▪ Internet 2.0 new modalities for service assessing/use ▪ Future extension on other rural areas/ municipalities | <ul style="list-style-type: none"> ▪ Competition with the operator of bike sharing e car sharing services ▪ Competition with the private bike and e-bike use ▪ Policy based on the key role of car ▪ PT services investment reduction |
|--|---|

Table 2 – Shared Mobility Agency SWOT analysis

3 New and extended public e-Bike system

3.1 LIMASSOL - LIM 4.2 Expansion of public bike sharing system, including e-bikes

In Limassol, the expansion of the bike sharing system offers more options to tourists to encourage them to follow more routes and to visit more points of interest in the area. Tourists have been informed about the bike schemes through the promotional material placed in hotels, tourist information offices and other locations all over the Limassol region, through the mobile application and the campaigns that have been implemented.

Four bike parking facilities were installed in the Limassol city and one bike parking facility in the rural area for general use. At the beginning of the DESTINATIONS project, 10 e-bikes and 20 conventional bikes were available for rent and the bike sharing company Next Bike CY increased its fleet to 120 bikes thanks to the project. Organising various events to promote the use of bicycles and to create awareness, all bike rental companies were invited to participate. The number of e-bikes available for rent has been increased to 21.

The bike sharing system is operated by the bike sharing company after signing an agreement with Next Bike CY. The bike sharing company is responsible for the operation and the maintenance of the system. The bike sharing system is self-sustainable with fees and memberships. With the expansion of bike sharing services, tourists and residents have the opportunity to use the expanded services and make their



Figure 3 – Limassol Bike Sharing Station

leisure trip more comfortable. The users have the chance to cycle in different areas of Limassol region with the leave/park the bike in any station of the network.

Residents and tourists find easier to use the bike in their everyday life, since they can cycle to different places. The number of users of the bike sharing system has been increased 40% in 2019 in comparison to 2018, statistics reveal that more people (October 2019: 6493 users, October 2018 :3604 users) are using the public bike sharing system.

Stakeholders are the following: Bike sharing Company (Next Bike Cy), Limassol Municipality; other Municipalities in Limassol Region; bike and e-bike rental companies.

Municipalities gave permission for the installation of bike sharing stations. More tourists and residents are using the bike sharing system and travel around Limassol.

3.2 RETHYMNO - RETH 4.2 "Building a sharing mobility culture"

Rethymno initiated new shared e-mobility solutions, as a result of private-public cooperation; the first dockless e-bike sharing system in Greece and a new e-scooter sharing system were launched, aiming to promote modal shift towards sustainable modes of transport, to both residents and visitors. The measure delivered:

- An 1,5-month pilot testing of an innovative dockless e-bike sharing system with 300 e-bikes
- A new dockless sharing system with 300 e-scooters
- A web-based mobile phone application and new payment methods for bike-sharing; prepaid cards for tourists available in hotels
- Large-scale campaign (including social media) to promote sharing mobility modes
- Safe driving campaign for e-scooters

Rethymno launched the first free-floating bike-sharing system in Greece, which was put in pilot operation in June 2018, as a private investment. More than 2.120 subscribers were active and used the bikes during the pilot operation and within the first semester of operation (by February 2019). During the operating period, difficulties related to the timely collection for charging and maintenance, and spatial re-distribution of the e-bikes were detected. The fact that cycling was not a mainstream choice for commuting and that the system was operating below its capacity led to increased operational costs challenging its economic sustainability, especially during winter when the tourist routes were lost. Problems related to equipment damage and lack of spare parts were also detected. Therefore, the Municipality, together with the investor, decided to withdraw the system, aiming to re-launch in May 2020 an improved service in terms of e-bikes quality and performance and lower number of e-bikes. The upgraded system of 50 free-floating e-bikes, will be supported by experienced municipal staff and additional publicity material.

Nevertheless, the innovative shared e-bike system unlocked the shared vehicles' potential, triggering more private investors to enter the local market. As a result, a new private investment for an e-scooters sharing system was introduced in Rethymno in July 2019. The system was marked as highly accepted since its initiation; 27.000 e-scooter rides were performed during the first month of operation and 11.000 users have been registered during July and August 2019, in just 2 months of operation, indicating a strong interest from citizens and visitors.

Data collection and analysis, performed by the investors, regarding the usage of e-bike and e-scooter sharing systems allowed them to study service adjustments to adequately cover users' needs and to identify the areas with higher demand; an efficient spatio-temporal framework for the e-bike and the e-scooters re-distribution was defined. Awareness campaigns and promotional activities, press releases and media interviews, free rides, and safe driving sessions enhanced public motivation to use alternative modes for last-mile transportation within the city.



Figure 5 – The dockless e-bikes system in Rethymno (top right and left), official launch of the system by Mayor of Rethymno Municipality and LIME (top middle)



Figure 4 – Map depicts the e-scooters use allocation for the city of Rethymno



Figure 6 - The e-bikes sharing scheme in Rethymno, promotion of the system in EMW2018 (right)

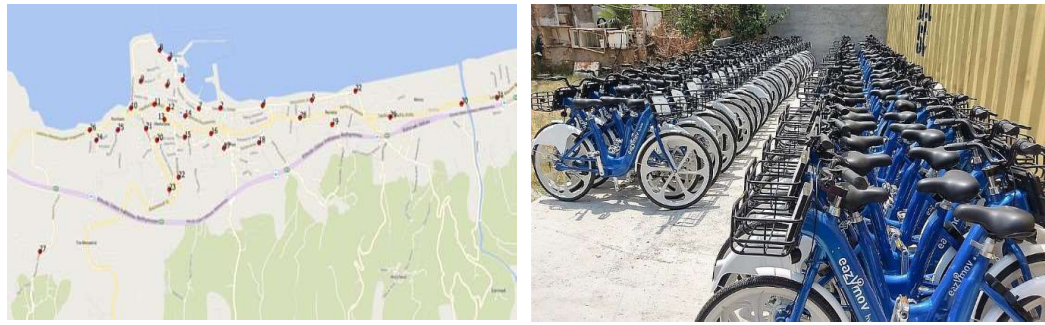


Figure 7 - The e-bikes sharing system fleet (right) was distributed to 32 spots (map on left) to cover and serve the total city of Rethymno

Learning points and reflections from the implementation

The previous bike-sharing system of Rethymno Municipality proved rather inefficient to serve citizens' and visitors' needs as limited shared stations and bikes were available on only a few specific city centre spots. The limitation of docking stations and available bikes around the city, in combination with the high maintenance cost and the capital cost for sufficiently expanding the system led the Municipality to explore different solutions and investment schemes. The selected free-floating scheme allows the distribution of e-bikes to cover the wider municipal area of Rethymno, also providing a more convenient service for the users in terms of "obtaining and returning" the bikes, demonstrating a "free-point-for-release" style. A major benefit for the Municipality was that the investment was done by a private operator. A baseline survey revealed citizens' mobility preferences and perceptions and defined dockless sharing vehicle schemes as the most suitable solution.

Considering that e-vehicle sharing systems are mainly private investments, a number of difficulties may occur in terms of seamless operation of the system and validation of its quality. A period of pilot operation is, therefore, crucial for identifying the real contribution that these services could provide to the overall mobility offer and system. For instance, it is necessary to have the possibility to access the data related to Origin and Destination of the trips, the number, and the typologies of the users. Having these data implies a negotiation with the private provider for complying in particular with privacy constraints related to the user's information but also to the financial aspects. Clearly a potential success of the pilot period will facilitate similar requests from the Municipality. Moreover, for the financial aspects, during the pilot period the seamless operation could also be verified in detail to understand the possibility to integrate the payment options used for the other services.

The lack of regulatory framework about the e-scooters movement, reflecting the public acceptance and safe circulation of e-scooters, was highlighted as a mandatory issue to be addressed at national and EU policy levels.

Investing in increased road safety, cycling infrastructure, awareness and public engagement and motivation to enable people to learn and use more of this type of systems is of major importance in order to improve acceptance and operation in full capacity.

Residents' and tourists' involvement

The shared mobility services acceptance, from residents and tourists, was at the core for the successful implementation and viability of the measure. Users' opinions and needs, both from residents and tourists, were recorded during workshops, consultation events, "design days",

and open-air laboratories as a basic step to define the system requirements and design functionality.

Rethymno further promotes a shared mobility culture through targeted promotional campaigns, in collaboration with the e-scooter operator. Citizens were informed about the newly-launched sharing modes through informational activities, tailored exhibition boards, citizen “design days” and open-air events. Promotional material was designed and distributed to hotels, touristic kiosks, and hotspots, to motivate tourists towards the use of sharing schemes for urban transportation. Informational events and e-scooter safety training sessions were held during European Mobility Week 2018 and 2019, to facilitate the e-scooters’ safe use considering that the regulatory framework is still in preparation. A survey questionnaire was designed to measure citizens’ and visitors’ awareness, and users’ satisfaction regarding the newly introduced shared mobility services.

Stakeholder engagement

The Municipal Tourism Board, the Hoteliers Association, the Association of Travel and Tourist Agencies, the local unit of the Technical Chamber of Greece, the Atlas Cycling Union and the University of Crete are amongst the stakeholders that Rethymno Municipality and TUC cooperated with, to build-up a shared mobility culture.

Hotel associations and cyclist unions proved more active in promoting the shared mobility culture and the new services launched in the city.

The private investors operating the e-vehicles sharing schemes were in close cooperation with Rethymno Municipality, to ensure a win-win situation, particularly in the case of the e-bike system re-launch.

Cumulative effect from the combination of DESTINATIONS measures

The promotion of the sharing mobility culture is the result of a group of measures such as the *RET 3.1-Active healthy and inclusive mobility for all*, with extended cycle network and links to public transport service lines, and *RET2.1-SUMP WATCH* development, aiming to increase the modal shift of greener alternative modes. *RET6.1-Sustainable Mobility Agency for tourists/visitors*, is further promoting the shared mobility services as the best alternative of last-mile transportation.

Funding unlocked due to the measure

The engagement of the Municipality and the continuous efforts in promoting shared mobility have attracted private shared mobility operators and resulted in new investments for relevant services. Rethymno achieved a significant increase in private investments in micro-mobility services, estimated around 150.000€ for the 300 e-Bikes systems and 100.000€ for the 300 e-scooters. Further funding was unlocked by Rethymno, receiving a 70.500€ ERDF funding for the installation of a free municipal bike-sharing system with 18 e-bikes and 1 e-bike for disabled people, stationed for free at a bio-climatically redesigned square, which will be in operation by April 2020.

3.3 MALTA - MAL 4.1 Promoting e-bike sharing and car sharing

The promotional campaign developed under measure MAL 4.1 supports the bike sharing services being launched by the private sector, and the car sharing system that has been launched late in 2018 through a government concession tender. Shared mobility services are a new but rapidly growing phenomenon in Malta. It is therefore important to promote these services to encourage their use and make their added value known.



Figure 8 - Poster promoting car sharing

While residents may have encountered these kinds of systems abroad, the majority of the population needs to be educated as to how these services work. Therefore, the initiative was taken to develop and disseminate the Information and Awareness Raising Campaign on bike and car sharing and cycling safety. The Information and Awareness Campaign was launched in November 2018, by means of infographics and informative videos on the topics of bike sharing, car sharing and cycling safety (as part of the National Cycling Strategy which was launched at the same time) on social media, TV, radio and printed media:



Figure 9 - Posters created as part of the promotion campaign

While encouraging the public to make use of shared transport services as an overall theme, the Campaign has focused on two messages separately and targeting specific target audiences per message:

- Through one branch of the Campaign, the public was presented with educational material on cycling safety.
- The second branch of the campaign directly promoted car sharing and focused on educating the public on the service itself while highlighting its added value and advantages.

The impact of the introduction of shared mobility services in Malta, and the accompanying Information and Awareness Campaign has been evaluated through a series of surveys with a sample representative of the Maltese population (residents). While every promotional opportunity, including radio and TV interviews, was maximised and the information was integrated in national EMW activities in order to increase dissemination reach, the impact on awareness and acceptance is not measurable yet. The introduction of shared mobility services in Malta is still very recent, and not all segments of society are ready to embrace such forms of transport. However, when looking at the aggregated dataset of the surveys, it becomes clear how younger respondents have a more positive attitude towards both bicycle and car sharing, as well as that the higher the education level of the respondent, the more positive the attitude to shared mobility services.

There exists the risk that the uptake of cycling as a mode of transport, remains low. While the public is conscious about the environment, personal transport choices are influenced by convenience and cost rather than by the environment. To this effect, as part of this measure, the study procured was done in order to focus the campaign in the following direction: “How much time and money will you save if you make use of this service”. It is believed that by making people directly understand what can be gained, it would be easier to convince the public to take up the service.

3.4 LAS PALMAS - LPA 4.1 Public e-bike system

The first bike sharing scheme operated in Las Palmas de Gran Canaria (called *LPAbyBike*) in the past aimed to foster urban cycling but was not as successful as expected due to some obstacles and barriers. The former *LPAbyBike* bike sharing scheme suffered some key technical problems – the bicycles were not suitable for Las Palmas weather (humidity, salt, etc.), high rates of vandalism and also financial difficulties (it was not economically sustainable due to the high dependency on public funds).

Besides all this, the *LPAbyBike* bike sharing scheme was not aligned with other sustainable mobility policies of the city notably the Sustainable Urban Mobility Plan (SUMP). For instance, it did not contribute to the objective of promoting multimodality as it was not integrated with the public transport system, nor did it help to boost cycling as it was implemented alone without an effective package of measures (more parking facilities or bike lanes).

The DESTINATIONS funding was an opportunity to overcome some capital costs barriers to replace the former *LPAbyBike* (the Municipality of Las Palmas de Gran Canaria and Sagulpa were struggling to allocate enough budget to purchase all the necessary equipment) and launch a new bike sharing scheme called *Sítycleta*.

Within DESTINATIONS, the city launched and operated a new larger digital-based bike system that replaced the former bike sharing scheme (LPAbbyBike). The *Sitycleta* is a station-based bike sharing (SBBS) system that includes 40 new bike stations (with a capacity of 10 bikes per station), 5 of which also have smart totems placed at touristic areas that offer real-time information, 35 solar-powered smart signs, 375 smart bikes with a solar-powered on-board computer that connects with the central servers by GPRS, 20 e-bikes and 2 adapted bikes accessible for physically impaired people. The *Sitycleta* service is available in several languages from 7 am to 11 pm, 7 days a week.

The allocation of funding for the *Sitycleta* is assured in the short term: in fact, revenues earned from parking management are used to fund this new sustainable mobility service (push & pull strategy). However, Sagulpa is concerned about the financial sustainability of the system in the long term. This is why Sagulpa has been looking for innovative revenue streams such as sponsorships, but they are still far from reaching that goal (revenues only covered 44% of the overall costs of the system in 2019).



Figure 10 - Solar-powered station.

Source: Sagulpa



Figure 11 - User of the *Sitycleta*.

Source: Sagulpa

The **areas of innovation and success factors** of *Sitycleta* are the following:

- **High-quality equipment:** the new bikes are resistant to salty air (thanks to the Aluminium frame and anti-corrosion treatment) and have an electronic anti-theft mechanism in the front fork controlled by an on-board computer. The former bike sharing scheme (*LPAbbyBike*) had a quite high vandalism rate (an average of 200 incidents per year were registered and 7 bikes were stolen every month). The mix of the anti-theft mechanism and the onboard computer that allows real-time tracking of the bicycles contributed to a reduction of the vandalism rate (only 40 incidents were registered in 2019 compared to over 230,000 usage of bikes).
- **Digital-based service:** bikes are equipped with an on-board GPS device that allows self-tracking and location in real time:
 - The data gathered by the on-board computers makes the management of the system easier (availability of bikes at each station, favourite routes and stations, average trip times, etc.). It also helps Sagulpa to optimise the efficiency of its rebalancing operations to serve the maximal demand as possible.
 - The on-board tracking system makes the system more flexible, making the transition from station-based sharing scheme (current) to free-floating easier.

In fact, the main barrier to switch from station-based to free-floating is not technological but the fear to disordered parking of shared bikes in the narrow streets of the flat area of the city.

- Being a digital-based mobility service helped integrate the new bike scheme into the overall urban mobility system (users can register/log in at the stations by using the same contactless card they use to ride urban buses).
- **Integrated system:** the stations enhance the attractiveness of public space and the integration of different services first of all at the bus stop. For instance, the coordination with other actions of the Bicycle Master Plan such as the new bike lanes network helped to enhance its effectiveness in promoting modal shift.
- **Communication strategy:** several communication campaigns and activities were carried out (online tutorials, social media, public events, etc.) and some were tourist-oriented.
- **Tourist-oriented:** the registration is free of charge and before renting their first bike tourists have to confirm their payment method (that can be a credit card). The system requires a deposit of 1 € which can be used in all fare types.

In April 2019 – a year after the launch of the new service – Sagulpa began a pilot that focused in promoting the use of e-bikes between the flat and hilly areas of the city. The results of the pilot have not been impressive in terms of number of rentals or share of e-mobility:

- The share of e-bike rentals accounts for only 1%-2% of the overall number of rentals of the bike sharing scheme. The *Sitycleta* fleet is mainly based on smart bikes (375; 95% of the overall fleet) and there are only 20 e-bikes available (5% of the fleet).
- The number of e-bike rentals is very irregular along the year which makes it difficult to identify any usage pattern of the e-bikes based on the month or season.



Figure 12 - E-charging station. Source: Sagulpa



Figure 13 - Sitycleta e-bikes. Source: Sagulpa

However, thanks to this pilot, Sagulpa is learning a lot about the operational stage of shared mobility services based on digital and electric solutions:

- Assessing the pros and cons of station-based systems (the current *Sitycleta* scheme) and free-floating schemes, especially the rebalancing costs
- Analysing the best location of e-chargers along the city
- Comparing maintenance costs of smart bikes and e-bikes

The **overall result** of the measure is summarised below: There are 36.059 monthly users and 15.863 (44%) are active (November 2019).

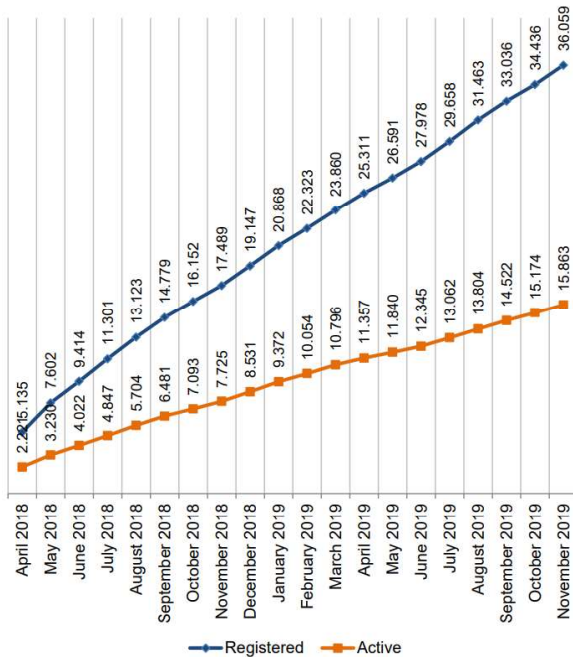


Figure 14 – Bike sharing monthly users in Las Palmas

The total distance ridden in 2019 was 1.142.504 km and thus there were 192 tons of CO₂ avoided (Sagulpa uses electric vans for the rebalancing operations so there are no CO₂ emissions linked to this activity).

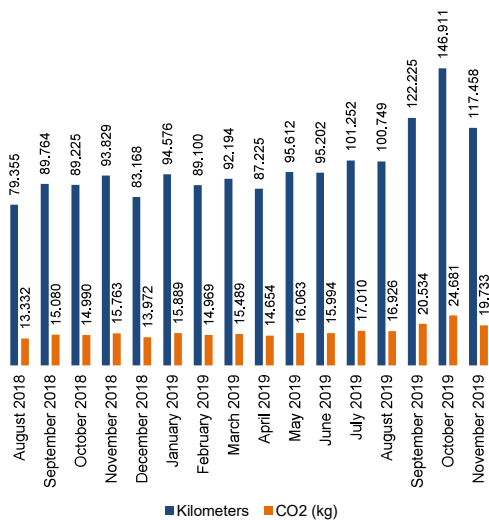


Figure 16 – Total distance ridden with BS

In working days, the number of daily users is 900. The average rentals per bike ratio is 3,5 on working days and 2,1 on weekends.

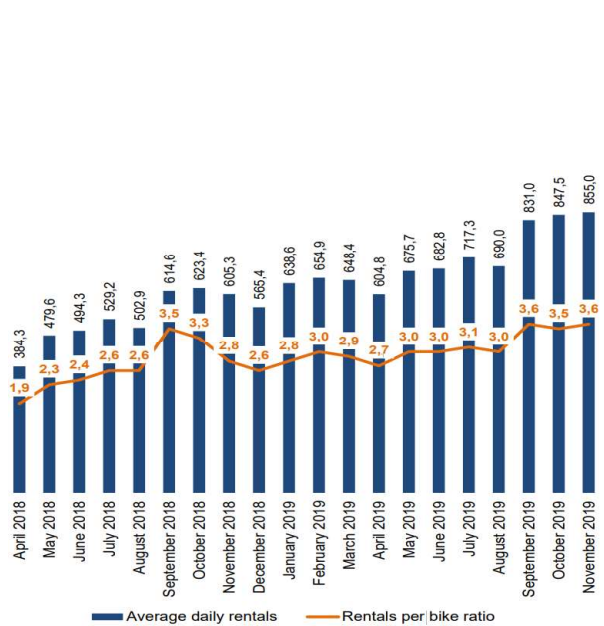


Figure 15 - Average rentals per bike ratio

Most of the users pay a yearly fee (67%).

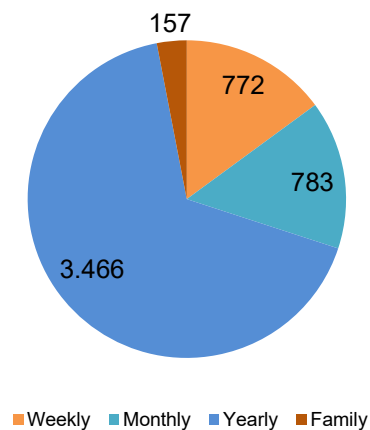


Figure 17 – BS Fee typology

The **main lessons learnt** from the implementation of the new Sítycleta bike sharing scheme in Las Palmas de Gran Canaria are summarised below:

- It is better to consider the specific needs of the more vulnerable target groups from the start of the design stage of the project – such as elderly people, physically impaired, etc.
- The business model of bike sharing companies has to be adapted to the city needs and requirements. Next Bike provided the infrastructure (stations, bikes, etc.) at the beginning of the project and Sagulpa pays a monthly fee for using the software management platform.
- It is crucial to engage the key local stakeholders in order to fine tune the bike sharing scheme (location of the stations, multimodality options, etc.).
- The bike sharing scheme should take into account the shape / urban structure of the city (flat areas vs. hilly areas, narrow streets, etc.).

Sagulpa is in close contact with some other cities (La Laguna and Mogán in the Canary Islands; and Limassol, Elba and Malta at a European level) to share with them these lessons learnt and to foster knowledge transferability and experiences about sharing mobility services.

31% of registered customers are foreign. Tourists use the bike sharing scheme more during the peak-season (November-March).
 Top 3 nationalities: Germany (17%); United Kingdom (15%) and Italy (8%).

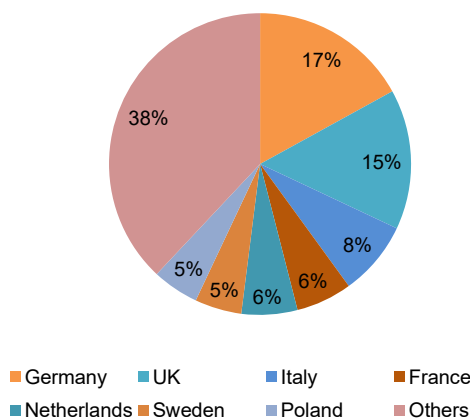


Figure 18 – BS customers per countries

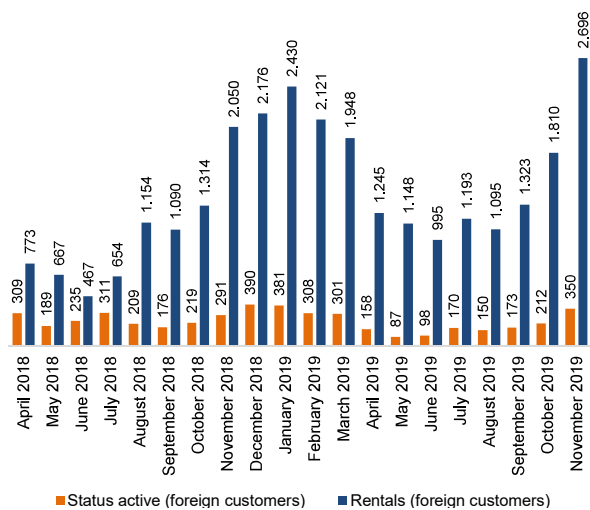


Figure 19 – BS use by tourists

Nowadays, Sagulpa is working closely with representatives of targets groups that proved to be the key to success of the new bike sharing scheme such as the cyclists’ users association (*Las Palmas en Bici*: <http://www.laspalmasenbici.org/>), schools and high schools and associations of disabled people.

In 2019, **fees and memberships covered only 20% of the Sítycleta’s costs** (the bike sharing scheme was launched in April 2018). After several meetings with local stakeholders, Sagulpa identified **sponsorships** as a new source of revenue. These sponsorships allow private companies to fund stations located in proximity to their business or designated high visibility market locations. Up to now (beginning of 2020), three companies have joined the Sítycleta as sponsors: *Hiperdino* (the largest supermarket chain in the Canary Islands), *Centro Comercial Los Alisios* (the largest shopping mall in the island) and *Language Campus* (a

language centre that hosts international students). Sponsors pay the costs of implementing new station(s) in the nearby of their business and cover all costs of rebranding the bicycles (vinyl, etc.).

Moreover, the good results of the *Sitycleta* have shown the potential of shared mobility in Las Palmas de Gran Canaria. In 2019, a private initiative launched a moto-sharing system with the support of Sagulpa. The aim of this sharing service is to provide a non-pollutant alternative for last-mile urban trips.

3.5 “New and extended public e-bike system” cluster analysis

The measures of this cluster are based mainly on the use of bikes both by means of sharing services and promotion campaigns pushing active mobility. The success of these measures in the DESTINATIONS sites confirmed even more the **importance that active mobility has gained in the last years in the overall scenario of mobility system**.

This cluster focused on the “**asset**” **sharing services** specially e-bike/bike and e-scooter in Rethymno, Malta, Las Palmas and Limassol under different service schemes and contract/responsibility scenario.

Both in **Las Palmas** and in **Rethymno**, the former existing bike sharing systems have been replaced by new ones which have proven to be more successful than the previous ones. For example, in the case of Las Palmas, the new system better answered to the city mobility plan indications and goals (better integrated with the existing PT services and cycling lanes, having a higher level of technology that ensures greater safety and reduces vandalism, having higher number of stations and bikes and more suitable stations distribution in the city). In Rethymno, a first pilot test period was pivotal to understand that a large scale dockless e-bike sharing system (operated by a private operator who undertook the investment/operation/maintenance costs) – the first implementation in Greece – would have represented a better option than the previous bike sharing services based on limited number of fixed dock station and operating under municipal resources.

In both cases the new bike sharing systems unlocked the shared vehicle's potential, attracting private investors to enter the local market: for example, in Rethymno the e-scooter sharing system was introduced with private investment. Malta (MAL 4.1) and Rethymno (RET 4.2) have seen significant increase in private sector investment in micro-mobility services. Local stakeholders suggest that this resulted from tourist towns offering lucrative potential markets for their products. Also because of regulations allowing companies to set up e-Bike and e-Scooters sharing schemes. It can be concluded that operators consider tourist towns as emerging and commercially attractive sites for investing in shared mobility services.

In Las Palmas, the Bike Plan focused on bike mobility (elaborated in 2013 and updated in 2016 and again in 2018-2019) helped to prioritise the Bike Sharing scheme as relevant component of the overall mobility in the city, to boost multimodality and to improve mobility management at a city level (in fact, the data generated by the new bike sharing scheme is an opportunity to improve mobility management in the city). The new bike sharing service was designed as a part of a **push and pull mobility strategy**: part of the income generated from parking management was used by Sagulpa to launch and operate this new bike sharing scheme. However, to date the system does not reach an equilibrium between operation costs and

revenues and is far from being economically sustainable. In this case the support of private sponsors (such as the major shopping centres in Las Palmas that have started to sponsor the bike stands set up costs) could guarantee the upkeep of the service and **become a new funding model.**

In all the four sites, successful EMW (European Mobility Week) events, large-scale information and awareness campaigns (radio, TV, social media) helped to promote the uptake of sharing mobility modes, showing the relevance of municipality support in promoting the shared mobility and in attracting private investment.

Moreover, the Public-Private Partnership could be a real option if the tourism operator or segment could be involved. As exemplified in Malta and Rethymno, the sharing system operators worked closely with the tourist sector to increase revenue and to maximise the channels of promotion of the services.

As a specific action for increasing the efficiency of the services and to increase the revenue with the collaboration of the tourist sector, in Limassol, the new five bike parking facilities were installed in specific tourist areas in order to guide tourists in some commercial areas and to increase the potential demand of services in support these areas.

Key findings for the CIVITAS Family

Analysing and comparing the different solutions and results of the four sites involved in the “New and extended (e-)Bike Sharing” cluster (see table 3 below for more details), it is possible to underline some main aspects that could be taken into account by a **Local Authority** in considering to implement bike sharing service:

- Firstly, it is necessary to develop a **detailed feasibility study** at least of the following elements:
 - business model in terms of “real” cost for the authority for the implementation of different BS schemes (including sponsor, advertising spaces, park lots, shelter, etc.)
 - dimensions and distribution of the fleet (considering the main origin/destination matrix)
 - parking areas (both for dock based and dockless schemes) in particular for the rebalancing process that could affect the carbon footprint provoked by the van used for relocating the bikes in the different parking areas/docking stations
 - specific problems (from vandalism to pedestrian and user safety) related to the station and service operation

These aspects should help the Municipality to understand if the bike sharing is the most “convenient” measure in favour of the bike use and which real benefits it brings at sustainable mobility level.

- Bike Sharing solution should be designed as component of **the overall Mobility Plan**: the BS should be considered as key elements of a smart city and should be integrated – thus, not in competition – with the other PT services.
- The authority should define in detail the type of procurement and contract to be signed with the service provider (from the availability of space for the bike-station to the incentive and relation etc.) including the role of possible advertisement contract.
- The authority should define in detail the support conditions and organisation aspects (PPP collaboration, competition or collaboration with PT services and PT operators).

Tourists may be a main target group for operators in touristic island destinations as they are much accustomed to use bike sharing services in their home town – they can play a critical role and provide a critical mass of users/revenue. Investing both in infrastructure (increased road safety, cycling infrastructure) and behavioural aspects (awareness, public engagement, motivation/incentive) to enable people to learn and use more such type of systems is of major importance in order to improve acceptance and operation in full capacity.

Moreover, the analysis of other BS services operated in other European towns cross-checked with the above results allows to put forward these further considerations:

- A Bike Sharing service can be economically sustainable if there is a substantial use of each bike per day (on average 5 trips per bike, although this figure also depends on the number of city inhabitants and the density) and low operating costs
- Sponsorship could be one of the revenue categories that could contribute to reduce the operational costs and to help the Bike sharing service to be economically sustainable
- Bike Sharing service can be more efficient if the price could be integrated with other mobility service tariff schemes
- Bike Sharing services could be supported through the development and promotion of mobile applications for booking and paying for different services (CS, BS and scooter, PT services, etc.)
- Bike Sharing services should be supported through specific Municipal regulations (in terms of use of bike lanes, dock areas, parking areas, access to pedestrian zones, recharging stations, etc) and this could be taken into account once the stakeholders have to make decisions on this type of service

ASPECTS AND CHARACTERISTICS OF BIKE SHARING SERVICES IN THE FOUR DESTINATIONS SITES

| | LIMASSOL | RETHYMNO | MALTA | LAS PALMAS |
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| Town Classification | Large (185,000) | Rethymno (approx. 60,000 inhabitants) is the capital of the capital of Rethymno regional area on the island of Crete. High seasonal fluctuation due to incoming tourism (during peak season accommodates visitors approximately 10 times its population in the nearby hotels) | The population of Valletta is 6,000 inhabitants. The Northern and Southern Harbour regions population is around 200,000. The whole inhabitants of Malta are just under 500,000. | Large city: 378.517 inhabitants (2018). The population of the Functional Urban Area (FUA) of Las Palmas de Gran Canaria is 632.018 inhabitants (2018) |
| Transport mode share | <p>Modal split:</p> <ul style="list-style-type: none"> - Car: 92.1% - PT: 1.5% - Bike: 0.7% - Walking: 5.5% | <p>Modal split approximately:</p> <ul style="list-style-type: none"> - 60% car users - 20% pedestrians - 10% public transport - 5% cycling - 5% taxi | <p>Modal split (2014):</p> <ul style="list-style-type: none"> - Car driver: 59.36% - Car passenger: 15.16% - Motorbike: 1.07% - Bus: 11.35% - Ferry: 1.01% - Bicycle: 0.27% <p>On foot: 7.6%</p> | <p>Survey 2012 (SUMP)²:</p> <ul style="list-style-type: none"> - 67% car - 15% pedestrian - 13% PT - 1% bikes/motorbikes - 4% others |
| Mobility strategy | <ul style="list-style-type: none"> - Modal shift - Town attractiveness - Leisure activity for locals and visitors - Welfare - Mobility of university students | <p>The mobility strategy focuses on:</p> <ul style="list-style-type: none"> increased bike sharing system attractiveness, increased safety of walking and cycling, enhanced PT attractiveness and services in order to achieve a modal shift to sustainable transport choices. Sharing schemes introduction aims to enhance the last-mile sustainable transportations within the city centre. Moreover, bike/scooter sharing systems provide an alternative eco- | | <p>“Plan Director de la Bicicleta” (Bike Plan) on bike mobility was elaborated in 2013 and updated in 2016, 2018-2019 to prioritise the actions to improve mobility by bike in the city. The BS scheme is an opportunity to:</p> <ul style="list-style-type: none"> Boost multimodality: new digital-based mobility services would help to integrate the new BS scheme into the overall urban mobility system. Improve mobility management at city level: The data generated by the |

² The Municipality of Las Palmas de Gran Canaria launched a tender for a household mobility survey within LPA2.1 (March 2020). Despite the tender already awarded, the lockdown implemented in Spain since March 14th 2020 delayed the beginning of work. The results of nation-wide survey about cycling mobility in Spain (Observatorio de la Bicicleta 2019) showed the following:

- 41,4% of the residents in the Canary Islands use the bicycle during the week (58,4% not)
- 16,5% of the residents in the Canary Islands use the bicycle on a weekly basis; 8,9% only during the weekends
- 9,6% at least once a month; and 6,4% less than once a month

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| Service objective | - Active mobility component - Tourist offer component | friendly- transportation for tourists, which are used to bike share in their own country The measure answers to the active mobility and E-mobility component: To launch a new –wide coverage – BS network; to promote a modal shift towards most sustainable modes; to introduce e-bikes; to increase bike use/ more active and healthier mobility; the e-bikes and e-scooters sharing systems addressed both tourists and citizens | Bike sharing services: - 1 by NextBike Malta (launched in 2016) – over 400 standard bikes + some e-bikes - 1 by Malta Public Transport (Tallinja Bike) 40 e-bikes sharing system (launched in 2018) | new BS scheme is an opportunity to improve mobility management in the city. The BS is addressed to both residents and tourists. Sagulpa assessed the needs and requirements of the key target groups (youngsters, commuters, tourists, elderly people, etc.) in the feasibility study that was carried out in the design stage of the service |
| Service extension | Four bike parking facilities were installed in the Limassol city (places of interests for tourists) and one bike parking facility in the rural area. The BS system is extended in the tourist area and along the coastal area as well as in the city of Limassol. The system was extended to the Limassol port to serve cruise visitors and the town centre to serve University students mainly. With the efforts of LTC, it was also extended to the commercial city centre. | <p>1. e-bikes sharing system Distribution of bikes around the city in 32 spots. The exact locations were defined based on the available public space (squares, pavements, etc.) according to the existing legislation on public spaces and pedestrian movement. The system operated as demand-based, the re-distribution of the e-bikes to different location is determined accordingly, by the demand. For the prioritisation of the final location, the convenience of users was considered based on the proximity of the selected locations to city's landmarks, points of interest for tourists, common daily routes of residents. The dockless e-bikes system covers the total city of Rethymno, including east and west suburbs https://doi.org/10.1016/j.rtbm.2020.100432</p> <p>2. e-scooters sharing system</p> | <p>- The majority of the BS Next Bike stations are located around the central urban area stretching from the capital Valletta to the tourist area and including the university and residential, commercial and employment centres</p> <p>Tallinja n3 E-bikes stations are located at the central bus station, at the ferry landing site in the Grand Harbour, and at the far tip of the city</p> | <p>Most of the bike stations are located in the flat part of the city. However, two stations for the e-bikes have been installed in the hilly part of the city in order to check a pilot test with e-bikes. Sagulpa plans to enlarge the bike sharing scheme twice next year:</p> <ul style="list-style-type: none"> - On the one hand, by opening 5 new stations in the flat area of the city alongside the Hoya La Plata – San José corridor (southern part of the city). On the other hand, by expanding the number of e-stations and e-bikes (5 new e-stations in the hilly neighbourhoods). |

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| | | <p>The e-Scooter sharing system which operates as a dockless system also, is distributed across the whole city and is based on demand. The scooters are re-distributed every day by the operator and are mainly concentrated at the most visited areas, which are along the city's long promenade.</p> | | |
| <p>Service features</p> | <p>-200 bikes -21 e-bikes -29 bike sharing stations LTC Installed only the bike parking facilities. 3 BS stations in collaboration with Next Bike and 2 bike stations for all (citizens and tourists). Regarding the 3 BS stations Next Bike CY, usually includes 5-10 bikes in each station depends on demand.</p> | <p>1. e-bikes sharing system - Operated by Bikeazy - 300 e-bikes (150 for pilot testing, total of 300 in official operation) - 2,123 subscriptions by 28th of February 2019, as recorded from the operator. 2. e-bikes sharing system - Operated by Lime - 300 e-scooters 11.500 registered users for the 2 first months of operation, July and August 2019 Both systems are dockless</p> | <p>Next Bike BS system: - 58 stations - over 400 bicycles Tallinja Bike: - 3 stations 40 e-bikes</p> | <p>40 bike stations (5 of them with smart totems placed at touristic areas) – ten bikes for each station; 20 e-bikes; 375 smart bikes; 2 adapted bikes accessible for physically impaired people. 36.059 monthly users and 15.863 (44%) are active (November 2019). Three e-vans (partially funded by CIVITAS DESTINATIONS within LPA4.2 measure) are usually used to rebalance bicycles. In working days, the number of daily users is 900. The average rentals/trips per bike ratio is 3,5 on working days and 2,1 on weekends; Most of the users pay a yearly fee (67%)</p> |
| <p>Service scheme</p> | <p>Dock-based bike sharing system Bookings can be made through an app, at the BS station terminal, on the website or calling a 24/7 hotline.</p> | <p>e-bikes sharing system: Dockless e-bike system “bikeazy” operated by Brainbox. “eazymov” mobile application presents the exact locations of the available bikes and the status of the battery for each available bike. In order to unlock a bike, it is required to scan the unique QR code. After use, each user will have to manually lock the bike. The charge is based on the minutes of use after the bike is unlocked. Cards and day passes are also available for users without smart phone technology. The system is owned</p> | <p>Both NextBike and Tallinja Bike are dock-based systems. Booking for Next Bike can be done through an app, hotline, website or at the terminals. Booking for Tallinja Bike can be done via an app and in some stations also through the terminal.</p> | <p>Dock-based BS system - Sign up for free. Sitycleta users can register through different ways (website www.sitycleta.com), smartphone App, directly at the Smart Totem, Customer support service by Phone number) - Payment data must be verified by a transfer or a charge of 1€ that will be deposited as initial balance, and can be applied to all rates. Once the customers' credit card has been loaded, the customer account is authorized immediately. The payment method can be changed at any time.</p> |

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| <p>Modality service acquisition</p> | <p>No procurement. NextBike Cyprus is the exclusive provider for the Limassol region. Nextbike was the first BS company that expressed an interest to start the system in Limassol. They received permission to set up their stations at municipal areas at a cost. The system grew very fast. No procurement. LTC held a letter from Next Bike CY that is the only provider in Cyprus. According to some exceptions including in the National Law for Public Procurement procedures, LTC followed the suitable procurement documents for direct awarding.</p> | <p>and managed by the private operator. - e-scooters sharing system Dockless e-scooter system operated by "Lime". A mobile app is available for users' subscription, providing in real-time the availability, location and battery level of e-scooters in the city. Registration, payment and reservation of an e-scooter (locking and un-locking) is provided through the application for smart devices.</p> <p>1. e-bikes sharing system Call for tender for the e-bike sharing system. The key requirements were for a dockless system with minimum 150 e-bikes to be operated in the municipality of Rethymno within 20 days of the signed contract. The contract with the providers was signed in July 2018.</p> <p>2. e-scooters sharing system The international firm of the e-scooter sharing system operator launched the system after an agreement with the municipality - initiation of the private investor.</p> | <p>These systems have been independently launched by private companies. Nextbike Malta is a local company, part of the international Nextbike franchise. Tallinja Bike is local.</p> | <p>- Rent a bike in several ways (by App, by the bike computer and at the terminal) Bicycles can be rented daily between 7 am and 11pm.</p> |
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| <p>Service requirements - Authority side</p> | <p>The municipality allows the setup of BS stations at pre-agreed locations, at an agreed cost.</p> | <p>e-bikes sharing system According to the agreement between the private company and the Municipality, the system will operate for five years with a minimum of 150 e-bikes (pedelecs). Municipality rented municipal space to the private investor, as a legal solution to provide the “stop-and-park” opportunity to the users. The overall operational and management issues have been defined by the private investor. e-scooters sharing system Similar to the e-bikes sharing system, the operational and system management issues have been defined by the investor. The agreement between the e-scooter operator and the municipality of Rethymno include sharing data of the usage.</p> | | <p>Sagulpa is a private company fully owned by the Municipality of Las Palmas de Gran Canaria. Amongst other services – such as the parking management, off-street parking facilities, etc. – Sagulpa is also responsible for operating and maintaining the bike sharing scheme.</p> |
| <p>Service Operator</p> | <p>According to the signing contract between LTC and Next Bike C.Y, Next Bike is the subcontractor operator.</p> | <p>1. e-bikes sharing system Dockless e-bike system “bikeazy” was launched in July 2018, with a pilot operation of 1,5 months. During the system’s operation, difficulties were detected, especially in terms of quality and durability of bikes. During the winter period, when the system was used far below its capacity, operational and maintenance costs were highly increased leading the Municipality and the investor to decide to withdraw the system. It was expected that the investor would re-launch an improved service of 50 free-floating e-bikes in May</p> | <p>Private operators with no relation to the Authority</p> | <p>Sagulpa, in house company, pays a monthly fee for using the software management platform. Sagulpa is the operator of the Bike sharing service, being responsible of all operations (maintenance, rebalancing, customer service, etc.). NEXTBIKE supplies the stations, bicycles and spares. Besides this, NEXTBIKE also provides the backend app.</p> |

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| | | <p>2020. Now on hold due to the COVID-19 implications.</p> <p>2. e-scooters sharing system</p> <p>A new private investment for an e-scooters sharing system was introduced, in Rethymno, in July 2019.</p> <p>The private investors operating the e-vehicles sharing schemes were in close cooperation with Rethymno Municipality, to ensure a win-win situation, particularly in the case of the e-bikes system relaunch.</p> <p>Operation suspended due to COVID-19 implications; LIME withdrew the equipment from all Greek cities.</p> <p>The overall operational and management issues have been defined by the private investor. No commitments defined from both sides.</p> | | |
| Investment/ capital and Operation costs | <p>Tariff for renting a bike: 2 euro/first 60 minutes; 1 euro/every additional minute</p> <p>Max 8 euro/24hrs.</p> <p>Annual subscription: €10 per month @ 120 mins per day (€120 a year)</p> <p>Monthly subscription: €20 per month @ 120 mins per day</p> | <p>The private investment of the 300 E-Bikes estimated around 150.000 euro.</p> <p>The private investment of the 300 E-Scooters is estimated around 100.000 euro.</p> | | <p>Costs of the service (2019): 436.000 Euro/year.</p> |
| Revenue aspects | <p>Advertisement on bikes</p> <p>- 1-19 bikes, 80 euro per bike per month</p> <p>- 20-29 bikes, 75 euro per bike per month</p> | <p>1. E-bike sharing system:</p> <p>1-day pass 19.90 euro for unlimited use</p> <p>3-day pass 29.90 euro for unlimited use</p> <p>5-day pass 39.90 euro for unlimited use</p> | <p>- Next bike sharing system the tariff scheme is the following:</p> <p>- For standard bikes: €1.50 for the first half hour, and €1 for every consecutive half hour for</p> | <p>Annual, weekly, and monthly tariffs are available, as well as for occasional use for any user who wants to have the opportunity to enjoy the bike).</p> <p>Sagulpa reached an agreement with four companies for the sponsorship of the Sitycleta bike sharing scheme.</p> |

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| | <p>- 50-99 bikes, 70 euro per bike per month</p> <p>- 100-172 ,60 euro per bike per month</p> | <p>Monthly subscription 14.90 euro + 0.50 euro every 15min</p> <p>Yearly subscription 89 euro + 0.50 euro every 15min</p> <p>Occasional users 1.00 euro first 15min + 1.50 euro every other 15min</p> <p>2. E-Scooter sharing system:</p> <p>1.00 euro to unlock + 0.15 euro per minute.</p> | <p>pay-as-you-go users, in addition to weekly (€15), monthly (€25), quarterly (€35) and yearly (€80) memberships, which include a free first half hour ride</p> <p>For e-bikes: pay-as-you-go rate (€ 3 for first half hour, €2 for every consecutive half</p> | <p>- Each sponsor pays 11.000 Euro/year that includes advertisements on the bicycles, the stations, and the app. In 2019 this sponsorship has only covered 3% of the overall costs of the system.</p> |
| Difference between costs and revenues | <p>Since the company does not have enough profit from advertisement and rentals is not able to reduce its rental prices. More activities are being carried out in order to keep the company sustainable.</p> | <p>Data are not available since the systems are operated by private companies.</p> | | <p>In 2019, revenues (users' fares and sponsorships) cover 46,33% of the overall costs of the service.</p> |
| Sponsorship Promotion | <p>The level of promotion of sponsorship is very high since is promoted on bike stations, website, and social media. However, the last year there is a reduction of the number of sponsors.</p> | <p>The level of promotion / sponsorship was totally decided by the private companies – data are not available. RETH and TUC initiated promotional activities to promote the sharing systems, aiming to increase awareness for their launch and motivate trial use.</p> | <p>Nextbike Malta works together with local sponsors (both private and public), which they promote on their bikes.</p> | <p>Up to now (beginning of 2020), three companies have joined the <i>Sityclefa</i> as sponsors: <i>Hiperdino</i> (the largest supermarket chain in the Canary Islands), <i>Centro Comercial Los Alisios</i> (the largest shopping mall in the island) and <i>Language Campus</i> (a language centre that hosts international students). Sponsors pay the costs of implementing new station(s) in the nearby of their business and cover all costs of rebranding the bicycles (vinyl, etc.).</p> |

Table 3 - Characteristics of the (e)bike sharing systems in the four DESTINATIONS sites

4 Shared e-charging infrastructure

4.1 MADEIRA - MAD 4.1 Promote the uptake of clean vehicles by fleet operators

The measure aims to boost electric mobility in Madeira, spread knowledge and create adequate conditions to increase the use of electric vehicles among private and public fleets, and citizens.

Strategy for the Promotion of Electric Mobility in the Autonomous Region of Madeira

In 2017, aware of the importance of electric mobility for the reduction in dependency from fossil fuels and pollutant emissions of transport and for the increase in use of renewable energy in electricity production in the Autonomous Region of Madeira, the Regional Government adopted a Programme that set goals and actions to 2020 for the promotion of electric mobility, aiming to reduce the environmental and economic negative impacts of the transport sector in the Autonomous Region of Madeira.

Expanding the e-charging network

AREAM provided technical support to DRET (Regional Directorate for Transport and Economy) and the municipality, as well as other stakeholders in the following activities, aiming to expand the charging network in Madeira and Porto Santo Islands:

- The Regional Government planned the installation of the six e-charging stations in Madeira Island public grid: in Funchal, Ribeira Brava, Câmara de Lobos, São Vicente and Machico districts. The missing one is planned to be installed by the end of the project.
- DRET promoted the installation of charging stations in tourism sector through contacts with stakeholders from accommodation, restaurants, airport and shopping centres.
- CMF implemented a green tariff to outdoor parking slots, which allows a free charge for electric vehicles and a 50% discount for hybrid vehicles.
- AREAM released normative information about the procedures to be adopted by the municipalities in the scope of the licensing of new constructions, regarding the installation of charging stations in new households and service buildings.

In this scope, the following results were achieved:

- 5 public fast e-charging stations (Funchal, Ribeira Brava, Câmara de Lobos, São Vicente and Machico districts) were installed by Regional Government.
- 17 normal e-charging stations were installed by municipalities (11 were installed by CMF).
- 11 normal e-charging stations were installed by private companies for clients use in shopping centres, restaurants, hotels and the airport.
- 18 normal e-charging stations were installed by public organisations in the framework of the national fund Fundo Ambiental for auto-consume.

Promoting electric vehicles acquisition

In order to promote electric mobility in Madeira, several promotional activities took place:

- In October 2017, members of the Regional Government had the opportunity to experiment using electric vehicles in daily service trips for one week. Five electric vehicles were included in the demonstration. There was an estimated energy saving of 983 kWh (78%),

a reduction in carbon dioxide emissions of 213 kg (63%) and a €90 reduction in energy costs (72%), compared to the combustion vehicles. A satisfaction survey was addressed to drivers and there was, in general, a positive opinion about the use of electric vehicles, despite the initial negative impression.

- In September 2017, AREAM and DRET launched two brochures addressed to approximately 137500 households and private companies.
- In 2017, DRET launched MADEIRA MOVE campaign, addressed to the whole population with special games for children and schools. This campaign included events in the whole Madeira Archipelago promoting the use of the electric vehicles, sustainable modes and road safety.
- Concerning the acquisition of electric vehicles in public fleets, AREAM supported three public organisations with a technical and economic feasibility study for assessing the acquisition of electric vehicles, aiming to support the decision making in the renewal of fleets. Despite all information, barriers remain in the momentum of acquisition, namely the confidence in the technology, in batteries and the amount of investment.
- AREAM and DRET have participated in several initiatives on media to promote the electric vehicles use.

Incentive schemes for electric vehicle acquisition

- Since 2017, the Regional Government offers free charging in all charging stations of the regional public grid, as an incentive for users of electric vehicles.
- Aiming to accelerate the decision of acquiring electric vehicles in public fleets, AREAM released information of the National Fund, Fundo Ambiental, that finances the costs for renting or leasing of electric vehicles and charging stations, over a period of 48 months, and supported organisations in their applications. In this scope, five entities were awarded financing for 23 electric vehicles for four years. HF was one of the awarded entities, with three electric vehicles and charging stations. In four years, HF will save about 10.000 L of diesel, about €10.000 and 23.700 kg of CO₂ emissions.
- In 2019, DRET launched an incentive scheme to support the acquisition of electric vehicles by citizens and companies in Porto Santo Island. This initiative named PRIME-RAM, supported by the regional budget (€400.000), co-financed 42 vehicles. This measure was aligned with the Sustainable Urban Mobility Action Plan of Autonomous Region of Madeira (MAD2.1) and the initiative “Porto Santo Sustentável – Smart Fossil Free Island”.
- In April 2020, DRET launched the PRIME-RAM to the entire Autonomous Region of Madeira for 2020, with a grant amount of one million euro (€1.000.000) from the regional budget.
- AREAM will launch a campaign for the acquisition of electric vehicles for private companies and citizens. Electric vehicles’ dealership companies were invited to join the campaign under special conditions. In this scope, an online platform is being developed, where information will be provided about electric mobility, the contents of the campaign and an adhesion form for those that want to benefit from the special conditions. Under this campaign, parallel actions will be developed, such as awareness raising actions for citizens, training for automobile workshop workers and training for fire-fighters to deal with damaged electric vehicles.
- AREAM is studying the impact of electric vehicles on the energy system, namely on the electricity load diagram, on renewable energies integration in the energy mix and on CO₂ emissions.

Between 2016 and 2019, the number of electric vehicles in the Autonomous Region of Madeira increased from 100 to 420. This number of electric vehicles contributes to an estimated annual savings of 3.600 MWh of energy and of 860 tonnes of Co2 emissions.

The main barrier is some mistrust that persists about the technology and maintenance costs, and the high price of vehicles compared with the combustion ones. To overcome these barriers, the project acted in different aspects, namely through the organisation of several information, awareness and demonstration actions, workshops with the main decision makers, local actors and citizens, the reinforcement of the public and private of charging stations' network, the creation of incentives for the acquisition and use of EV, and the realisation of training sessions for automobile workshops workers and firefighters to address capability and safety issues. In all phases of the project, efforts were made to involve electric vehicle merchants, key players in the dynamic of this sector.

Private companies were the main drivers of the electric mobility sector, due to the bigger investment capacity and the tax incentives created at the regional and national level. By the end of the project it is expected that the increase of electric vehicles in Madeira will continue, due to the ongoing initiatives.



Figure 20 – E-vehicles uptake and promotion in Madeira

4.2 LIMASSOL - LIM 4.1 Electric car rental connecting Limassol with airport and port

Limassol Tourism Board, with the support of key stakeholders, **has installed seven EV-Charging stations, four with dedicated shelters**. The key stakeholders involved with different levels of commitment and contribution are the following: Cyprus Electricity Authority, Cyprus Ports Authority, Limassol Marina, Car Rental Companies Local Authorities and Limassol Region Municipalities that offer free parking offer for e-cars and Hermes Airports.

In collaboration with Electricity Authority of Cyprus (EAC) the best locations have been mapped to create a successful EV charging station network in Limassol region. After some delays in the installation due to difficulties to obtain urbanistic authorisations, two stations have been finally installed at New Port and at the Municipal Parking of Ypsonas Municipality in Limassol Region, and the other two will be installed by the end of June 2020 (delays caused by COVID-19) at the municipal parking of Mesa Geitonia Municipality as well as at another municipal area of Ypsonas Municipality. Both airports of Cyprus have EV-Charging stations.



Figure 21 - Construction works for the installation of EV – Charging point with shelters at New Port and at the municipal Parking of Ypsonas Municipality

The locations of the EV-Charging stations are shown in the Limassol Mobility app; maps and posters have been defined and printed to largely disseminate information about the existence and exact locations of the EV-Charging Stations. Maps are used as promotional material for the service and have been distributed to hotels, tourist information offices, shops and other commercial activities in the city.

Additionally, a market benchmarking has been carried out regarding new electric car sharing options in airports, ports, and Limassol tourist area. The research includes questionnaires and interviews with car rental companies. The research is currently on-going, information on the results will be included as long as the research will be concluded.

This measure aims to propose an additional option to use a sustainable mobility mode for locals and tourists



Figure 22 – Limassol Maps of the EV charging stations

wishing to visit the island. The installation and creation of EV-Charger stations in the road network is an incentive to car rental companies to introduce or increase the number of e-cars in their fleet and to create e-car rental services to connect the airports, port and Limassol tourist areas.

The current number of EV users in the island is slightly increasing and is currently set at 120. The Ministry of Transport, Communication and Works has planned financial incentives for buying an electric car. The Electricity Authority Cyprus (EAC) has undertaken the task of installing fast EV-charger stations on the motorways connecting the different regions of the island. The plan of EAC is to install **18 new EV-charging station** in all Cyprus. Six EV-chargers will be based on fast mode and the aim is to motivate people to use an e-car instead of a conventional car. The engagement of the EAC added extra value facilitating also the promotion of the EV use.



Figure 23 – EV Charging Station in Limassol

4.3 LIMASSOL - LIM4.3 Promote the uptake of electric vehicles, campaign on e-mobility

Promotional campaigns have been organised within this measure with the aim to raise awareness about EV modes and their positive impacts. Limassol Tourist Company prepared the promotional material for the electro-mobility campaigns: dedicated brochures, advertisements in hotels and lifestyle magazines, billboards, posts in local media, radio campaigns, a dedicated Facebook page updated on an ongoing basis, a web page on electromobility #poweruptoelectric, a promotional video etc. All this material helped promoting and conveying the idea that e-vehicle use is a new sustainable way of life.

The main following events were organised: 1st national seminar (July 2017); e-mobility in Limassol Marathon (March 2018); 5th Sustainable mobility conference (May 2018); 2nd national seminar (July 2018); EU mobility week (September 2018 and September 2019). In European Mobility Week 2018, LTC organised all the following activities: (cycling photo exhibition, competition, live link, bicycle showcase of the event and competitions, walking tour). All these events were successful in demonstrating people's interest to the e-mobility issue. Another communication campaign took place in European Mobility Week 2019 including various activities (photo competition, e-bike testing, showcasing of sustainable mobility products, bicycle challenge, walking with safety with students of primary schools). Residents and tourists participated in the organised campaigns and events. A total number of 2.500 people followed/attended the events and campaigns. Participants were very interested in all activities and the opportunities offered (e-bike testing etc). Participation in campaigns and events contributed in increasing awareness and interest in electromobility.



Figure 24 – Limassol E-mobility promotion campaigns

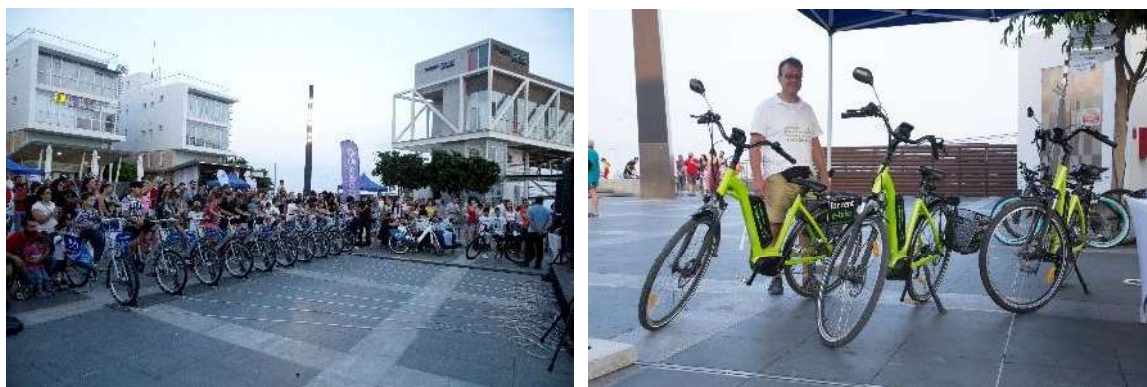


Figure 25 – Limassol Events on e-bikes

This measure together with the installation of the EV charging station (LIM4.1) helped in raising the number of private electric car owners in Limassol Region. Moreover, an increase in the number of e-bikes available for rent in Limassol region has also been achieved.

Active stakeholders are the following: Electricity Authority of Cyprus, Council for the promotion of Cycling, Ministry of Transport, Communication and Works, Cyprus Police, Limassol Cycling Club, Bike Sharing Company-Next Bike CY, Commissioner of the Environment, Bike and e-bike rental companies and Hotels.

The implementation of the CIVITAS measures gave the opportunity to Cyprus Electricity Authority and bike sharing and rental companies to increase the interests of the users to prefer more sustainable modes of transport in Limassol.

4.4 RETHYMNO - RETH 4.1 Uptake of electric vehicles by fleet operators

Rethymno promotes the uptake of electric vehicles, by introducing **the first public charging infrastructure in the region**, aiming to enhance the circulation of zero-emission vehicles by tourists and citizens. The measure delivered:

- Three EV charging stations offering free charging and parking spots for all e-vehicles circulating in Rethymno; the first public EV chargers at regional unit.
- Dedicated signage for the charging stations and the designated parking slots, incorporating elements to promote electro-mobility and support the sustainable profile of the city.
- Awareness and informational campaigns, including test drives and public events, to promote the uptake of electric vehicles.

Rethymno achieved to overcome regulatory barriers that occurred during the installation phase, acting as a reference for the definition of the national framework.

Data collected from the electric vehicles charging points (EVCP) use indicate that the number of e-cars circulating in Rethymno is slowly increasing. Rethymno is in collaboration with the Hellenic Electricity Distribution Network Operator for the potential installation of three additional EV charging points, within the administrative boundaries of the municipality, enhancing the city's EVCPs network.

Introducing electric vehicles as an alternative mode of transport in the region of Crete is a new challenge since residents are not very familiar with EVs and their benefits. Charging infrastructure is also rare in public spaces, and only a few e-cars are circulating in the whole region. The limited awareness and interest for EVs can be addressed by tailor-made campaigns highlighting the benefits of clean vehicles e.g., economic, operational, and environmental positive effects.

The analysis of currently available EV spots in the region of Crete and the future e-vehicle equipment supply patterns based on geographic, demographic, and policy-based EV trends, facilitated the identification of needs before the EVCPs installation. A cost-effective approach provided a new “charge-and-park” service aiming to promote the EVs uptake at a local level. Greek legislation requirements and limitations were also considered regarding the appropriate public spaces for new EVCPs installation.

Dedicated signage can be an essential component of a successful communication strategy, aiming to promote e-vehicles circulation. Therefore, the signage, design by TUC, provides a powerful message that enhances the city's profile as a sustainable destination.

Rethymno conducted successful awareness and informational campaigns, including test drives and public events during EMW2018 and EMW2019 and related campaigns (radio, TV, social media), to promote the uptake of the EVs targeting both locals and visitors. Residents were informed about the benefits of the new infrastructure, the cost, and energy-saving potential and the parking benefits around the city.

The regional authorities cooperated with Rethymno Municipality and the local team to investigate the potential expansion of charging infrastructure to the main entrances of the island. One-to-one meetings with fleet operators, car rental and taxi fleets, were conducted to motivate and boosting towards procurement of electric vehicles by identifying suitable incentives such as tax reduction.

The Association of Travel and Tourist Agencies and Hoteliers Association were engaged to promote the new service in tourists.

The promotion of e-mobility in Rethymno is the result of the implementation of a group of measures; RET 4.1- Uptake of electric vehicles by fleet operators and EV charging stations installed, RET 7.1-Introduction of electric vehicles into the municipal and public transport fleets, RET 4.2 – Building a shared mobility culture through the integration of new e-vehicles sharing schemes. Those cumulatively impact a slowly growing shift from private car use to cleaner transportation modes and towards cleaner vehicles and fuels.

Across the road network of the Region of Crete municipalities, publicly-owned EVCPs were available to offer free charges to residents and tourists. Rethymno provides this service enhancing and promoting the measure as good practice for replication from neighbour municipalities.

Funding unlocked due to the measure

The measure managed to unlock additional ERDF funding of 50.000€ for three EV charging stations; two will be installed in the city centre (fast chargers) and one will be installed adjacent to the national road network connecting Rethymno with Chania. Furthermore, by 2022, the Hellenic Electricity Distribution Network Operator plans to install three more EV chargers in Rethymno. The regional government also intends to procure EV chargers to be installed at selective locations at the regional level, expanding further the EV charging network on the island.



Figure 26 – EV Charging stations in Rethymno (top left), data use from charging points (top right) and EVs exhibition and test drives as part of promotional activities (bottom)

4.5 ELBA - ELB 4.5 EV legislation revision and charging infrastructures

The transition from fossil-fuelled mobility to electric mobility is one of the objectives of the strategic energy plan (PAES) of Elba. Elba island, though, did not have any specific regulation regarding EVs nor electric charging stations. In this measure, a handbook (“vademecum”) for fostering the use of clean vehicles, in particular EV and PHEV, was elaborated by the Portoferraio Municipality and Rio and shared with the other five island Municipalities. This handbook, focused on the suggested rules for the circulation of electric vehicles, includes several aspects: free parking in the blue line parking lots, free circulation in the LTZ, free charge at dedicated “green” reserved parking lots, managing the recharging stations and areas, etc.

Moreover, ENEL, the largest electricity provider in Italy, has agreed to install 15 charging stations in some key points in Portoferraio, 8 in Rio and a total of 50 charging stations on the whole island at its own expense (no operational costs for the CIVITAS DESTINATIONS project). This will lead to an additional measure output, as the initial number of recharging infrastructures foreseen to be installed in Portoferraio and Rio was 3.

This measure will foster the attractiveness of Elba Island for tourists by creating support conditions for the development of electric mobility with benefits for the environment and the tourism experience and the residents’ quality of life.

While the facilitation process with the other 5 Elba municipalities was successful (all agreed to the installation of the recharging infrastructure), the site is experiencing difficulties due to environmental, permit and national regulations which are delaying the installations. The first installations are at the moment scheduled for the summer of 2020; surveys will be conducted among citizens and tourists to find out the opinion of citizens and verify the real number of EVs circulating on the island. The handbook will be then updated with the indication of the charging stations as soon as these are installed.

Beside the Municipalities of Portoferraio and Rio, the other stakeholders identified at the beginning of the project were represented by the town police of Portoferraio, the Elba shopkeeper association and EV rental companies, and were actively involved and provided relevant suggestions on the elaboration of the “handbook” (in particular for the EV regulations within city centres).



Figure 27 – Enel e-charging station

4.6 LAS PALMAS - LPA 4.2 Fast charging EVs

The CIVITAS DESTINATIONS project supported Sagulpa to overcome some of the existing barriers for the uptake of e-mobility in Las Palmas de Gran Canaria.

On the one hand, the project co-funded **six new EV charging points** to boost the visibility of public recharging and therefore encouraging existing drivers of combustion cars to switch to electric alternatives. These EV charging points were supplied by a local company (*Microeólica Canarias SL*) and were installed throughout the city (two EV chargers at each of the following parking facilities of Sagulpa: *El Rincón*, *Subida de Mata* and *Fast Park*). Therefore, the EV chargers are only available for Sagulpa's clients who do not pay a fee for using them.

Each of them provides a power of 7kWh per phase which means that to fully charge an EV typically takes 3-4 hours. Their location was decided taking into account the electric power availability at Sagulpa's parking facilities.



Figure 28 – EV charger stations at Muelle de Sanapú and Muelle de Sanapú parking facility.

Source: Sagulpa

The project also supported the transition to public electrified fleets by **co-funding three electric vans** that replaced the previous diesel van fleet. These e-vans (Nissan ENV200) are being used in the daily operation of Sagulpa's staff (parking management enforcement, maintenance of parking facilities, etc.).

The EV charging stations co-funded by the project provided an **innovative added value** to the city:

- **Possibility to define data-based policies.** The energy consumption is monitored on a regular basis and the data gathered is a valuable source to identify charging patterns and assess the behaviour of EV drivers (average charging time, peak and off-peak charging hours, type of vehicles that use the chargers, etc.). This information will be used to design the enlargement of the EV charging stations across the city.
- **Solar charging.** The EV charging station located at the *Sanapú* parking facility is **partially powered by solar panels** (15% of the overall charging power). Sagulpa is assessing how solar charged EV stations could lead to a cost-effective solution for EV charging.
- **Public Private Partnerships (PPP).** Sagulpa is collaborating with Nissan in the enlargement of the EV charging network in Las Palmas de Gran Canaria.

The e-vans that are part of Sagulpa's fleet have also provided innovative issues:

- **Lead by example.** The public electric fleet is showing the general public the benefits of transitioning to EVs.

- **Building a knowledge base.** Sagulpa is gaining experience with the full EV supply chain. This knowledge is being transferred to other public bodies of the Municipality of Las Palmas de Gran Canaria with the aim of a further EV adoption and stimulating green jobs in both the public and private sectors.

The overall results of the 6 EV charging points in 2019 (first year of fully operational stage) are summarised below:

- The total energy consumption was 79.981 kWh.
- The EVs that used the charging stations of Sagulpa travelled approximately 533.207 Km (on average, an EV can travel 6,67 Km with 1 kWh). Therefore, the EV charging point helped to save around 50.121 litres of fuel and 66,65 tons of CO₂³.

Moreover, the EV chargers provided valuable data in order to define different user profiles:

- The *Sanapú* EV chargers are used mainly on the weekends, meaning people use them when visiting the surrounding area for leisure reasons (new Aquarium, marina, etc.).
- The *El Rincón* EV chargers are located in a Park&Ride facility and they are more used in the morning, when people go to work and leave their car charging there.
- The other EV chargers (located at *Subida de Mata*, *Elder*, *Metropol* and *Oficinas* parking facilities) are more used on working days during the night.

The overall results of 3 e-vans of Sagulpa's fleet are summarised below:

- Reduction of fuel consumption. The conventional vans that were replaced by the 3 e-vans consumed 18.222 litres of diesel between 2014 and 2016 (an average of 6.000 litres of diesel per year). Sagulpa is currently saving around 600 Euros/month on fuel (reduction of 75% of the overall fuel consumption).
- Reduction of CO₂ emissions (kg) by 50%.
- Reduction of maintenance costs of around 2.500 Euros/year (reduction of 71%).

The **cost of the energy supply infrastructure was the main barrier for the implementation of the EV charging points.** In Las Palmas de Gran Canaria, the installation of EV charging points requires an upgrading of local grids. Despite innovative solutions such as smart charging that will reduce peak loads, up to now reinforcements and upgrades are needed to prepare for the integration of EVs in the energy system.

The key success factor for the introduction of EVs in Sagulpa's fleet has been that full-EVs proved to be suitable for most of the fleet's use requirements. That helped to overcome one of the main existing barriers (range anxiety of some members of Sagulpa staff). Increased exposure to EVs have given many employees familiarity and comfort with the vehicles.

If Sagulpa was able to repeat the introduction of new EV chargers it would **include a payment system in the charging devices** from the beginning. Despite the business model (fees, memberships, etc.) still being under discussion, Sagulpa is fully aware that offering free charging leads to a lack of price transparency and a gift of public funds.

³ These figures were calculated using the following assumptions: 0.776 kg emissions of CO₂ per kWh of final energy consumption (source: *Instituto para la Diversificación y Ahorro de la Energía* (IDAE), Spanish Energy Institute)

Tourists are not the main target group of this measure. However, as rental car companies are replacing their conventionally-fuelled cars for environmentally-friendly fleets (hybrid, electric, etc.), they would become a key target group in the coming years.

Sagulpa is still in contact with some key stakeholders in order to continuously improve the EV charging network in Las Palmas de Gran Canaria. On the one hand, Sagulpa involves representatives of the association of EV users (*Asociación de Usuarios de Vehículos Eléctricos*, <https://www.auve.org/>) in the key steps of the decision-making process regarding the update of the business model, enlargement of the EV charging network, etc. On the other hand, Sagulpa is also in contact with local EV authorised dealers and rental car companies in order to find synergies and new ways to cooperate.

The enlargement and improvement of the EV charging network awoke the interest of key local stakeholders such as local EV authorised dealers. That encouraged new synergies such as the *mobility island* that Sagulpa implemented in 2019 in partnership with Nissan. This space includes:

- One fast EV charging point available 24 hours a day provided by Nissan available for EV with Chademo or Combo compatible chargers
- Two stations of the public bike scheme (*Sítycleta*): one of them has 10 anchor points for regular smart bikes and the other one has 10 more anchor/charging points for the e-bikes.

The goal is to provide the city of Las Palmas de Gran Canaria with infrastructure that allows a shift towards more sustainable mobility, with the tools to encourage the use of EV and shared mobility services. The regional government (*Cabildo de Gran Canaria*) is deploying a plan to enlarge the EV charging infrastructure across the whole island of Gran Canaria (<http://fluyecanarias.com/gran-canaria-recarga-vehiculos-electricos/>).

4.7 “E-Charging Infrastructure” Cluster analysis

The implementation of the measures of this cluster was successful in all the five sites involved and contributed to a further uptake of e-mobility initiatives at local level. For example, the first 3 publicly-owned EV charging points were the first to be installed in the whole of Crete, and the installation of additional charging stations has been planned in the near future in all sites. The development of the measures led to an increase of the number of electric vehicles in Madeira, Las Palmas and Rethymno and to the unlocking of regional and national funds for the acquisition of e-vehicles in Madeira and Rethymno. It is also worth mentioning that new public-private collaboration for the enlargement of the e-charging network arose especially in Las Palmas, Rethymno and Madeira, demonstrating the great importance of the involvement of private companies that, having a higher investment capacity, can accelerate the shift towards more sustainable mobility.

Key common elements for the success of these EV measures have been identified in:

- tailor-made information, awareness and demonstration campaigns with the main decision makers, local actors and citizens, highlighting the benefits of clean vehicles (e.g. economic, operational and environmental positive effects).
- electrification of the public transport fleet, boosting the visibility of EVs and showing the general public the benefits of transitioning to EVs.

- local incentives for the use and acquisition of EVs.
- realisation of training sessions to address safety issues.
- direct involvement of electric vehicle traders.

Key findings for the CIVITAS family

Analysing and comparing the solutions and results in each of the five sites involved in the “E-charging infrastructure” cluster, it is possible to underline some main aspects that could be taken into account by a **Local Authority** to establish/enlarge e-charging networks. For example, the local authority should take into account several issues, depending on the local context:

- need to have specific parking lots with dedicated horizontal and vertical signs
- need to understand the possibility of having double purpose dedicated lots (e.g. allow Municipal vehicles parking in these lots)
- need to understand the most suitable charging modality (slow, fast)
- need to have specific rules to foster the use of EV (e.g. free parking during the charging time, free electric charge, etc.)
- need to understand the most suitable business model for providing the services, for example:
 - private charging points only addressed to specific clients (e.g. hotel/camping guests, supermarket clients, etc.)
 - private station networks for public use (e.g. installed and managed by national electricity providers, public parking facilities, etc.)
 - public station networks (i.e. installed and managed by public authorities/entities for citizens, as a public services)
- need to have a specific app for accessing the recharging and reporting the services
- need to analyse in depth the cost for the equipment and installation, the maintenance, the electricity supply, and the control centre (if any)
- need to analyse the possible source of revenue coming from subscription/charging fees, parking fees, sponsorships, and public contributions

The experience in the DESTINATIONS project outlines the importance given by local authorities and efforts made for pushing a local large-scale adoption of electric vehicles. The enlargement of the of e-charging station network, the adoption of EVs in PT fleet, dedicated promotion and awareness campaigns and workshops, local incentives and investment in the infrastructure can certainly help to increase the number of EVs.

However, the growth of this market is far from being rapid. Several barriers, also identified by the five sites, are hindering a swift widespread adoption of these vehicles. In particular, the high cost for dedicated energy supply infrastructure and the need to reinforce and upgrade the local technology (e.g. local grids) to prepare for the integration of EVs in the energy system are the main challenges faced. The higher e-vehicle cost in comparison to conventional vehicles is one of the main barriers behind the reluctance of users to buy EVs. Moreover, the lack of a capillary charging infrastructure, and the still scarce autonomy of the e-vehicle generate a general fear and/or anxiety among users concerning safety issues and autonomy.

Although the results obtained by the measures developed in CIVITAS DESTINATIONS are promising, there are still challenges remaining in order to make EVs an effective alternative and sustainable transport mode in our cities.