2020 CiVITAS
Cleaner and better transport in cities

DESTINATIONS

D7.1 Users' needs and requirements, ex-ante evaluation, service design and ITS specifications for PT enhancement. (Output of Tasks 7.2)

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LIM – Limassol
LPA – Las Palmas
MAL – Malta
MAD – Madeira
RET – Rethymno

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EXECUTIVE SUMMARY

This report details the results of the user needs analysis, the definition of service requirements and ITS specifications for all the WP7 demonstration measures in each site as outputs of Task T7.2. It also looks ahead to the implementation phases of the various measures across the six project sites and within the measure categories.

Chapter 1 introduces the WP7 objectives and peculiarities and provides a description of the measures per cluster category.

Chapter 2 presents the user needs analysis and requirements at site level, highlighting the key stakeholders interested in the development of WP7 measures and analysing the similarities and differences of the stakeholders' categories involved by each site.

Chapters 3, 4 and 5 present the design of each individual measure, grouped into the three identified clusters. This structure allows for immediate comparisons to be made about the design and preparation work in different sites and hence experience and knowledge to be exchanged.

1. Introduction

1.1 WP7Overall Objectives

WP7 aims at designing, implementing and demonstrating the sites' measures targeted for the improvement of public transport (PT) service as backbone for sustainable and attractive tourist destinations.

The main objectives and tasks of WP7 activities are:

- To design, implement and demonstrate new/enhanced PT services in terms of flexibility, routing and timetables properly targeted to comply with tourist mobility and well integrated in the overall mobility offer of the sites (all sites).

- To design, implement, deploy and demonstrate ITS-enabled solutions to increase the attractiveness of PT towards the tourist and leisure transport demand:

    - Info-services to offer easy and common access to integrated information on PT and tourism services removing the barriers for PT use for leisure trips (Madeira, Las Palmas de Gran Canaria, Elba, Limassol); and
    - Smart payment systems to increase the flexibility of the PT offer for tourists (i.e. access to promotional tariff) and to facilitate the interoperability of payment tools (i.e. sell of bundle of services package) (Madeira, Elba).

- To enable the adoption/extension of electric and low emissions fleet to increase the attractive potential of the sites in terms of sustainable destinations and to support the take up of innovative PT services suitable for leisure demand (Madeira, Las Palmas de Gran Canaria, Rethymno, Limassol).

In order to provide the activities related to site coordination, the measures have been clustered as follows:

1) Improve PT services, introducing new lines and increasing the quality of service.
2) Introduce clean vehicles, clean fuels and efficient driving for PT fleets.
3) Improve integrated mobility and tourism travel information and payment services. In particular, measures in this cluster will play a relevant role in the project answering mobility needs (flexibility, improved accessibility, integrated access to mobility and transport info, etc.) generated by tourist demand and partially by residents.

1.2 WP7 Structure and Tasks and D7.1

Overall, WP7 activities are broken down into a number of cross-site and vertical tasks addressing the specific phases and operations of the piloting life cycle.

- Task 7.1 Cross-site coordination of pilots targeted to PT enhancement.
- Task 7.2 User-needs analysis, stakeholders' involvement, service requirements and supporting technologies design for pilots targeted to PT enhancement.
- Task 7.3 Site preparation, solution deployment supporting actions and demo setup for pilots for PT enhancement.
- Task 7.4 Demonstration of improved PT services for tourists and residents.
- Task 7.5 Demonstration of electric, hybrid and liquefied petroleum gas (LPG) buses (and eco-driving).

- Task 7.6 Demonstration of integrated mobility and tourism information and payment services.
- Task 7.7 Data collection for ex-ante, process and impact evaluation of piloting for PT enhancement.
- Task 7.8 Local dissemination and communication of piloting for PT enhancement.

In this context, the Deliverable D7.1will detail the results of the user-needs analysis, the definition of service requirements and the details of service and ITS specifications for all the sites as an output of Task T7.2

1.3 WP7Measure Clusters

1.3.1 Improved public transport services for tourists and residents

The demo sites will implement improved PT services that connect main tourist attractions, airports and cruise terminals. Improved PT services will be a topic of a technical workshop during the first consortium meeting.

	Improved public transport services for tourists and residents(WP7 Task 7.4)
MAD 7.2	Attractive PT
LPA 7.1	Communication for the introduction of the Bus Rapid Transit (BRT)
RET 7.2	Improved PT for tourists and citizens
ELB 7.1	Improve PT services for tourists
LIM 7.1	Improvement of PT routes, timetables, ticket procedure and bike transportation on buses to make the service more attractive
MAL 7.1	Integration of ferries into the PT network

Table 1 – Measure Clusters. Improved public transport services for tourists and residents

MAD 7.2– Horários do Funchal (HF), with the support of Secretaria Regional da Economia,Turismo e Cultura (Sretc),and Camara Municipal do Funchal (CMF, will jointly carry out PT marketing approaches, in order to make it more appealing for tourists. This goal will require a set of interventions, such as 40 redesigned bus stops, implementation of 1 interactive mupi, 5 restyled front office desks, teaser videos to showcase PT services and a completely brand new image for PT and its drivers.

LPA 7.1 - In Las Palmas de Gran Canaria, a new BRT system will be realised that connects the main points for tourism and leisure. Guaguas will carry out an innovative information campaign to point out the BRT´s advantages. It will include a 3D movie and dedicated sessions for target users.

RET 7.2 - PT services assessment studies and PT users' surveys will help to improve the PT services to serve both tourists and citizens' needs. Rethymno, supported by TUC, will introduce new thematic PT routes and two excursion routes for cruise passengers. PT service will be improved through 3 new attractive smart bus stops with real time travel information, attractive information packages and bike racks on selective bus routes. Over 50 bus drivers will receive safe driving and eco-driving training.

ELB 7.1 - Under the leadership of Rio Marina, supported by Portoferraio, involving also the other island municipalities PT services on main axes and feeder services will be redesigned - Shared Mobility Agency (WP4).

LIM 7.1 - Based on the user needs analysis, LTC will propose improvements to the PT service, regarding routes, timetables and ticketing procedures with the aim of selecting the most suitable for piloting during the project. To promote the integration between the bicycle and PT, bicycle racks will be installed on 20 buses.

MAL 7.1 - TM will coordinate the piloting of a new PT route to connect the ferry landing sites situated on both sides of the Valletta peninsula, the main Bus Terminal outside the City Gate and the P+R Facility outside Valletta. The route will be served through one mini bus retrofitted to LPG or duel fuel.

1.3.2 Electric, hybrid and LPG buses (and eco-driving)

	Electric, hybrid and LPG buses (and eco-driving) (WP7 Task 7.5)
MAD 7.1	Electrical vehicles and clean fuels for PT and urban and interurban fleet
LPA 7.2	Hybrid buses in the urban bus fleet
RET 7.1	Introducing electric vehicle for PT
LIM 7.2	Creation of an electric bus hop-on hop-off service in the old town
MAL 7.1	Integration of ferries into the PT network

Table 2 – Measure Clusters. Electric, hybrid and LPG buses (and eco-driving)

MAD 7.1 - AREAM will coordinate the development of several pilot tests, which includes pilot test with urban electric buses, the evaluation of the performance of 5 electric or hybrid buses and the demonstration of photovoltaic systems in tourism and interurban buses. In addition to this, the work plan includes an eco-driving incentive programme and tests with tyre pressure monitoring system kit in urban buses.

LPA 7.2 - Guaguas will test the adaptability of 3 hybrid buses to be introduced in its fleet.

RET 7.1 - Rethymno will operate (rent) 1 electric mini bus, accessible to people with disabilities to operate a pilot route that connects the main parking stations of the municipality and the beach. The e-bus will serve the school and University communities during winter time. An electric car will be purchased for the activities of the technical department of Rethymno Municipality, to be a moving promotional element for electromobility.

LIM 7.2 - LTC and Limassol Municipality will demonstrate two Hybrid buses hop-on hop-off service.

MAL 7.1 - TM will retrofit one minibus to use LPG, or dual fuel technology, for testing the operation of a PT route to connect the ferry landing site to the Park+Ride facility outside Valletta.

1.3.3 Integrated mobility and tourism information and payment services

ITS solutions will be tested to improve accessibility to PT focusing on tourist mobility: i) clear and accessible pre-trip / on-trip information on sustainable mobility options at tourist destinations; ii) open data on PT that can feed travel planners and apps from different providers and different countries; iii) co-operation with tour operators and long distance operators; iv) multi-lingual information; v) integrated payment services and promotional ticketing offers.

	Integrated mobility and tourism information and payment services(WP7 Task 7.6)
MAD 7.3	Smart PT traveller information service
MAD 7.4	PT Smart Multi-task Ticketing System, in open standards
LPA 7.3	Real time mobility and tourism information services
LPA 7.4	Integrated payment solutions for mobility and tourism
ELB 7.2	Integrated payment
ELB 7.3	APP for user real time information
LIM 7.3	PT traveller information system
LIM 7.4	Mobility application and travel planner for smart phones to provide real time information

Table 3– Measure Clusters. Integrated mobility&tourism information and payment services

MAD 7.3 - HF, SRETC, CMF, AREAM and ARDITI will demonstrate advanced user information systems both pre-trip (website and integration of multi-operator trip planners) and on-trip (10 new on-street infopanels) and fleet control system that also offer assistance to travellers.

MAD 7.4 - HF, with the cooperation of SRETC, CMF and AREAM will develop and implement an interoperable ticketing system for different mobility and touristic services in Madeira, perform a complete pilot ticketing system and create a revenue split centre and web services farm.

LPA 7.3 - GUAGUAS and SAGULPA, will improve the real time mobility information offer already available integrating sharing services (WP4) and other mobility information (i.e parking) and it will extend the real time information at bus stops with 20 screens that will be powered with solar energy.

LPA 7.4 – A ticketing system will offer integrated access tickets for tourists to use PT and enter tourist attractions and leisure events. Equipment for Smart Card validation will be introduced on vehicles of the new BRT network. Before the arrival of the BRT system, this equipment will be installed on the current articulated buses to check the adaptability and technical communication between several cancellation points and the ticket machine.

ELB 7.2 - Rio Marina Municipality, with the support of Portoferraio Municipality and MemEx, will analyze the possibility of extending the local PT payment card used in another transport basin to ELBA for PT services and the integration of other mobility services. Design and implementation of service payments by mobile SMS/APP through and web portal (as module of Sharing Platform) will be done.

ELB 7.3 - An innovative AVL system based on APP and certification module will be provided by MemEx and tested both for the provision of infomobility services and validation of operated services (to act on planning/operation level to gain reliability).

LIM 7.3 and LIM 7.4 –Limassol, with the support of LTC and the Limassol Bus Company, will install info-panels at 25 smart bus stops of the sea-side connection linking the tourist area to the city and old town. The Limassol bus company will install electronic scrolling signs on buses, providing information to users (next stops, ticket purchasing).

2. User Needs Analysis &Requirements at Site Level

2.1 Madeira

2.1.1 Recognised needs and goals

WP7 in Madeira comprehends four measures. This set of measures aims at implementing and demonstrating initiatives that are likely to improve the PT service, regarded as a backbone for a sustainable and attractive tourist destination.

In the island, there are 5 companies providing PT services in different areas. All these PT providers operate in specific areas determined by the Regional Authority for Transport so there is no direct competition between them. Currently, there are no buses running on alternative fuels, only diesel fuel.

Horários do Funchal fleet, for example, had in 2016, an average age of 19 years old, with almost half of its 158 buses being Euro I or pre-Euro. During the past years it became increasingly important to find new funding schemes that could help supporting a large fleet renewal. However, it is not only a matter of funding. There are severe orographic constraints. The streets in Madeira, especially in Funchal, are very narrow and steep, hence it is not possible for a regular bus to operate on all urban routes. Most buses have to be adapted to local characteristics by Horários do Funchal maintenance staff at the operator depot.

Funchal experienced the use of small electric buses some years ago (back in 2006), in the so-called Eco Line which deployed a fleet of four mini Gullivers. But the buses proved to be unreliable and the service was substituted by a diesel fleet of mini-buses. Even though alternative fuels and clean vehicles could hardly be considered a sound choice for PT Operators in Madeira Island, technology is being developed at a high pace, and it is time to have a new comprehensive insight on the possibilities to operate a fleet of green buses in such difficult topographic conditions. This is envisaged as a field test for manufacturers all around the world.

MAD 7.1		
Target group	**Needs**	**Goals**
Tourists/ visitors and Residents	– Improvement of air quality and noise reduction in urban space – Reduction of fossil fuel dependency – Increased use of clean fuels – Leverage a PT fleet renewal with low emissions solutions	– Increase use of PT amongst visitors – Improve attractiveness of PT – Reduce environmental impact of PT – Promotion and uptake of electromobility – Behavioural change of residents – Promotion of sustainable mobility modes
MAD 7.2		
Target group	**Needs**	**Goals**
Tourists/ visitors and residents	– Enhance accessibility and comfort at bus stops – Need to improve service with more attractive appearance. And innovative tools – Nurture PT staff towards a more commercial attitude	– Ease the access of tourists and residents alike to PT related information – Improved options and services for tourists – Improved comfort and satisfaction of the PT users
MAD 7.3		
Target group	**Needs**	**Goals**
Tourists/ visitors and	– Need to improve information	– Improve the mobility information for all

residents	system in PT service – Need to integrate transport information with touristic information – Poor PT service quality must be improved with new technological solutions	types of users – Improvement of quality of life – More attractive tourist destinations and PT satisfaction – Raise awareness towards alternative modes of transport
MAD 7.4		
Target group	**Needs**	**Goals**
Tourists/ visitors and residents	– Enhance smart ticketing solutions – Contribute to turn Madeira into a more attractive touristic destination	– To increase PT demand – To improve PT attractiveness – To integrate in one tariff tool mobility and touristic services

Table 4– Madeira Needs and Goals

In the previous CIVITAS project, Horários do Funchal have developed a sustainable fleet plan, which envisages the need to further test new buses powered by alternative fuels and assigned to specific routes. The company has also studied the over cost related to the provision of PT in an outermost island.MAD 7.1. will contribute to this debate through, for example, the demonstration of electric and/or hybrid buses.

During last ten years PT usage has been capable of tackling the severe decrease in PT users especially within residents. Local partners involved in this WP7 all agree that DESTINATIONS brings exciting opportunities for the liaison between tourism and transport in terms of incentives, information given and marketing approaches to tourists. This is where MAD 7.2. fits in. It is also time to focus on new technological services that can be of value for PT planners and for tourists and locals themselves. This is why partners will demonstrate advanced user information systems both pre-trip and on-trip and will also benefit from an interoperable ticketing system for different mobility service in MAD 7.4.

Touristic potential of sustainable mobility options represents the distinguishing factor that are likely to improve PT services and make it appealing for all, tourists and locals.

2.1.2 Key Stakeholders

Drawing from the stakeholders listed in D8.1 Stakeholder Maps and Guidelines and the Measure Description Form, key stakeholders including their expected interested and powerare collected in the table below.

Stakeholder		MAD 7.1	MAD 7.2	MAD 7.3	MAD 7.4
Municipality of Porto Santo	Power	High			
	Interest	High			
Regional Electricity Company (EEM)	Power	Low			
	Interest	Low			
Other regional PT operators	Power	Low		Low	Low
	Interest	Low		Low	Low
DRE (Regional Education Authority)	Power		High		
	Interest		High		
Hotels in target area	Power		High	High	
	Interest		High	Low	

M-ITI (Madeira Interactive Technologies Institute)	Power		Low		
	Interest		High		
ACIF (Chamber of Commerce)	Power		High		High
	Interest		Low		Low
Other municipalities of Madeira	Power		High		
	Interest		Low		
University of Madeira	Power		High		
	Interest		Low		
Local Communication Channels	Power		High		
	Interest		Low		
APRAM (Harbours Administration of Madeira)	Power		High		
	Interest		Low		
Association for handicapped people	Power			High	
	Interest			Low	
Schools in the target area	Power				High
	Interest				Low

Table 5– Madeira Stakeholders

In MAD 7.1. AREAM has prepared a pilot test campaign with CaetanoBus-Siemens, and scheduled a pilot test of their electric bus on several different PT routes along the Region. AREAM has also strived to contact several international bus manufacturers to convince them to perform future tests with electrical buses in Madeira and Porto Santo. Among the companies contacted are the following: BYD, Irizar, Solaris, VDL and Volvo.

AREAM has defined the baseline indicators for Madeira Evaluation Plan (D9.1) and defined the requirements for the procurement for the acquisition/ development of PV kit to help run tourism buses.

In MAD 7.1 HF has prepared the procurement schedule: acquisition of energy efficient safe driving support systems – to be installed in 20 buses – procurement to be launched shortly; acquisition of tyre pressure control systems to be installed in 50 buses – procurement currently taking place and acquisition of five plug-in hybrid buses - procurement currently taking place.

As for MAD 7.2., HF has started to work with the municipality in view of the incoming European Mobility Week, preparing PT promotion campaigns and initiatives. The company has also liaised with the municipal authority that manages access to the main beaches of Funchal and jointly agreed a protocol including mutual discounts.

MAD 7.3. and MAD 7.4. measure leaders have been developing similar contacts, with companies that can provide joint products (AVL integrated with the new ticketing system). Most of the companies are domestic-based. In addition to the above, the smart PT traveller information service has also contacted the local association for handicapped people in order to capture their views about the difficulties felt by this group of citizens when using PT services and related products (such as the mobile application).

2.1.3 Target User Groups

Residents and tourists are the main target users that will benefit from Madeira measures within the Civitas DESTINATIONS project.

2.2 Limassol

2.2.1 Recognised needs and goals

The transport system in Limassol is inconvenient and not very well developed. There is a need for an improved and upgraded PT timetable, ticketing service, routes and connections. In addition, there is a need to combine cycling with the use of PT by installing bike racks on buses. This will allow cyclist to combine sustainable mobility modes for their leisure trips. The old ticketing system on buses is causing delays. Improving the PT ticketing services with the use of new technology will save time and make the bus routes more time efficient. The changes of ticketing machines will be in context of Ministry's updates for PT.

There is no hop-on hop-off service in Limassol town. The old town area is becoming increasingly attractive to visitors and locals resulting in high traffic and parking problems. Such a service, efficiently connected with PT routes from the tourist area, will enable travellers to visit attractions in Limassol town, without the use of a rented car. The fact that the service includes audio guides offering the tour in different languages is an additional advantage. This service will be an added value to Limassol as a destination since it will provide for the first time a chance to visit the most interesting places with a single price, combining sustainable mobility modes in a very easy manner. The experience of visitors is expected to be enriched by this service.

The lack of real time travelling information discourages tourists and locals from using sustainable mobility modes in their everyday lives and for travelling around Limassol. This measure will ensure the installation of electronic scrolling signs inside buses, informing the PT users about the following stops, so that they (especially tourists) know where to get off the bus, the end of route, bikes on buses, ticket purchasing, etc. Visible and noticeable signs noting the bus stop name will be placed at bus stops informing users of their expected waiting time. The service will make PT more attractive and user friendly. The system will enable people to use real time information and plan their travelling accordingly. It will also provide tourist information that can be useful in ensuring an enriched tourist experience.

LIM 7.1		
Target group	**Needs**	**Goals**
Tourists/ visitors and Residents	– Improvement and upgraded PT timetable, ticketing service, routes and connection – Bike racks on buses	– Save time and make bus routes more time efficient – Combine cycling with PT – Reduce CO_2 emissions
LIM 7.2		
Target group	**Needs**	**Goals**
Tourists/ visitors	– Improved options and services for tourists – Visitors' experience to be enriched.	– No hop on/hop off service – audio guides offering tour in different languages – Decrease number of rented car and Less traffic noise in the city centre
LIM 7.3 & LIM 7.4		
Target group	**Needs**	**Goals**
Tourists/ visitors and residents	– Lack of real time travelling information – Integrate transport information with touristic information – PT service to be improved with new technological solutions	– Improve the mobility information for all types of users – Improvement of quality of life – More attractive tourist destinations and PT satisfaction – Raise awareness towards alternative modes of transport

Table 6– Limassol Needs and Goals

The goal is to reduce CO_2 emissions, minimise traffic noise in the city centre and lessen energy consumption, contribute towards public health and safety, change habits of local people and tourists and increase the total share of citizens that use sustainable mobility modes.

2.2.2 Key Stakeholders

The below list of stakeholders have been identified for consultation:

Stakeholder		LIM 7.1	LIM 7.2	LIM 7.3	LIM 7.4
Cyprus Tourism Organisation (CTO)	Power	Low	High		Low
	Interest	High	High		High
Limassol Bus Company	Power	High		High	High
	Interest	High		High	High
Ministry of Communications &Works	Power	High	High	High	High
	Interest	High	High	High	High
Tour guides association	Power		High		
	Interest		Low		
Hotels and tourist businesses	Power		Low		Low
	Interest		Low		High
Local authorities	Power		High	High	High
	Interest		High	High	High

Table 7 – Limassol Stakeholders

The Cyprus Tourist Organisation was involved in recording complaints from visitors regarding inconvenient PT routes, connections and timetables. The Limassol Bus Company and the Ministry of Communication and Works will be involved in improving the accessibility of PT routes and timetables, improving the ticketing system with new technologies and the installation of bike racks on buses.

Limassol Bus Company will provide information and appropriate permissions for the creation of hop-on hop-off routes. The Ministry of Communication and Works is informed about the implementation of the measure and will provide necessary support. Limassol Bus Company provides information for planning of the measure.

The tour guides association will assist in designing the tours including interesting places to visit and will assist with the audio tour text. Hotels and tourist businesses will be involved in promoting the hop-on hop-off service to their guests.

The Limassol Bus Company will provide an acceptance letter for the installation of the electronic scrolling signs inside the buses as well as ensuring that the system will be maintained in the long run. The Ministry of Communications and Works will be involved in approving and supporting this effort and possible expanding the system all over Limassol and in other regions. Local authorities will provide support to determine the bus stops that need to be upgraded, provide electricity and technical service and other support to materialize this measure.

To date, Limassol has collaborated with the main key stakeholders and main involved actors. Limassol is collaborating with the Ministry of Communication and Works, the Limassol Bus Company and the Cyprus Tourism Organisation information offices.

2.2.3 Target User Groups

Residents and tourists are the main target users that will take advantage of the Limassol measures within the Civitas DESTINATIONS project.

2.3 Las Palmas de Gran Canaria

2.3.1 Recognised needs and goals

The main goals of WP7 measures in Las Palmas de Gran Canaria are:

- Reduced emissions / increase air quality
- Reduced energy consumption
- Reduced the congestion.
- Improved overall urban accessibility
- Enhanced social cohesion
- Improved cost effectiveness of transport services
- Enhanced attractiveness of tourist destinations

Las Palmas de Gran Canaria has already developed a sustainable urban mobility plan (SUMP) (2009-2012) where a detailed diagnostic of the mobility was set up and the result was a set of strategic measures for urban mobility. Some of these measures have already been carried out and others are still waiting to be implemented.

According to the SUMP, the modal split in Las Palmas de Gran Canaria concluded that 67% of all trips were undertaken using private cars, either as a driver or a passenger and only 12% of all trips belonged to urban PT.

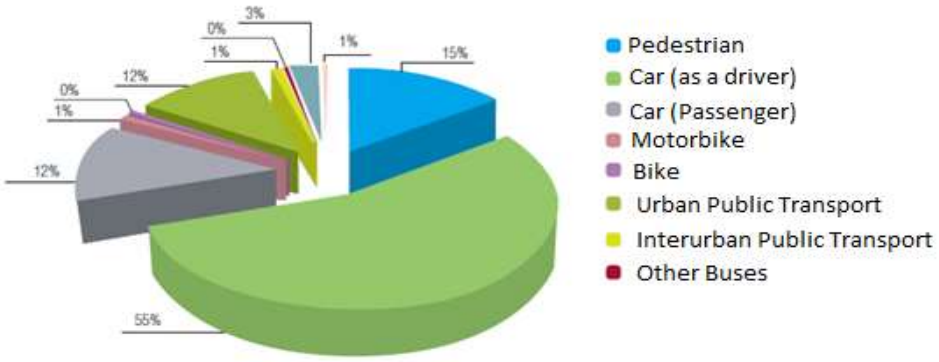

Figure 1- Modal Split in Las Palmas de Gran Canaria

In order to improve the uptake of a sustainable mobility behavior among the residents and citizens of Las Palmas de Gran Canaria and to reduce the congestion and pollution of private cars, the SUMP proposed a set of actions focused on the improvement of urban PT, parking management, public bike system and pedestrianisation.

Within all these measures, there were two main actions focused on the improvement of urban PT:

1) Enhancement of the PT network. This measure was carried out in 2013.However, for the implementation of the BRT system, another modification and improvement of the current urban PT network will be carried out to better adapt to the new system.

2) Development of a BRT. This measure is being developed in parallel and it is expected to be set up by the beginning of 2021, its project has already been drafted, in fact, works have started in june 2017).

Civitas DESTINATIONS is supporting Las Palmas de Gran Canaria to make urban PT more attractive and convenient not only for citizens and residents but also for tourists and visitors by implementing a complete set of actions.

LPA 7.1		
Target group	**Needs**	**Goals**
Tourists/ visitors and Residents	– Communication of the new BRT system	– Raise awareness about the new BRT system – Communicate construction works of BRT system – Minimize inconvenience to neighbours and visitors – Behavioural change of residents – Promotion of sustainable mobility modes
LPA 7.2		
Target group	**Needs**	**Goals**
Tourists/ visitors and residents	– Improvement of air quality and noise reduction in urban space – Reduction of fossil fuel dependency – Increased use of clean fuels – Leverage a PT fleet renewal with low emissions solutions	– Increase use of PT amongst visitors and residents – Improve attractiveness of PT – Reduce environmental impact of PT – Promotion and uptake of electromobility – Behavioural change of residents – Promotion of sustainable mobility modes
LPA 7.3		
Target group	**Needs**	**Goals**
Tourists/ visitors and residents	– Need to improve information system in PT service – Need to integrate transport information with touristic information	– Improve the mobility information for all types of users – Improvement of quality of life – More attractive tourist destinations and PT satisfaction
LPA 7.4		
Target group	**Needs**	**Goals**
Tourists/ visitors and residents	– Improve smart ticketing solutions – New PT tickets focused on tourism needs – New payment equipment for BRT service	– To increase PT demand – To improve PT attractiveness – Increase the number of touristsusing PT services – To test new payment equipment before BRT arrival

Table 8– Las Palmas de Gran Canaria Needs and Goals

2.3.2 Key Stakeholders

The below list of Stakeholders have been identified for consultation:

Stakeholder		LPA 7.1	LPA 7.2	LPA 7.3	LPA 7.4
Cabildo de Gran Canaria (Regional Government)	Power	High	High	High	High
	Interest	High	High	High	High
Autoridad Única del Transporte de Gran Canaria (Regional Transport Authority)	Power	High	High	High	High
	Interest	High	High	High	High
Autoridad Portuaria de Las Palmas (Harbour Authority)	Power	High			Low
	Interest	High			Low
Patronato de Turismo de Gran Canaria (Gran Canaria Tourism Board)	Power				High
	Interest				High
Federación de Empresarios del Transporte (Business Transport Federation)	Power		Low		
	Interest		High		
Clúster Canario de Transporte y Logística	Power		Low		
	Interest		High		
F.E.H.T. – Federación de empresarios de Hostelería y Turismo de Las Palmas. (Business Federation of Hotels and Tourism of Las Palmas).	Power				Low
	Interest				High
GLOBAL (interurban PT operator)	Power	Low	Low		Low
	Interest	High	Low		High
GEURSA	Power	High		Low	
	Interest	High		Low	
Schools and University	Power	Low			
	Interest	High			
Local Police Department	Power	High			
	Interest	High			

Table 9– Las Palmas de Gran Canaria Stakeholders

There are mainly two different categories of WP7 stakeholders in Las Palmas de Gran Canaria. Some of them are closely related to PT management and development, while others are necessary and will help to attract tourism market to PT.

Cabildo de Gran Canaria and Autoridad Única del Transporte are involved as Authorities in charge of PT policies and management at island level. Cabildo de Gran Canaria has committed to funding part of the MetroGuagua implementation that is being constructed in parallel way to the Civitas DESTINATIONS project for which communication activities is partially funded by Civitas DESTINATIONS.

Meetings with Autoridad Portuaria de Las Palmas has been held and will be held because its collaboration is needed to carry out part of the MetroGuagua layout that will affect the harbour area. Furthermore, meetings with schools, neighbourhood associations and local police representatives are planned to carry out specific mobility plans for the MetroGuagua construction works. GEURSA is already working with Guaguas Municipales to draft and award the projects for the MetroGuagua construction works.

Gran Canaria Tourism Board and tourism business associations will be taken into account to develop new tourism urban PT tickets.

2.3.3 Target User Groups

The main target users that will take advantage of Las Palmas de Gran Canaria measures within Civitas DESTINATIONS will be:

- Citizen and residents (Urban PT customers and people who do not use urban PT in order to change their mobility behavior).
- Urban PT drivers and workers.
- Trade unions of Guaguas Municipales.
- Tourists and visitors.

2.3.4 Gap in the market

To date, urban PT in Las Palmas de Gran Canaria has focused on satisfying the mobility needs of citizens and residents of Las Palmas de Gran Canaria, particularly education, employment and leisure trips.However, in future and partly due to Civitas DESTINATIONS, Guaguas Municipales will explore a great potential market: the tourists that arrive at Las Palmas de Gran Canaria.

2.4 Malta

2.4.1 Recognised needs and goals

Two of the most visited tourist destinations are within the Valletta Region: Valletta and Cottonera. Moreover, two of the most popular tourist resorts are also located within the Valletta Region; Sliema and St Julians. These three locations are very conveniently connected by a ferry network with routes connecting Sliema to Valletta and Valletta to Cottonera.

Apart from the ferry network, bus transport and hop-on-hop-off buses connect the tourist resorts to the most popular tourist attractions, and yet 22% of all tourists still opt to hire vehicles during their stay on the island. This, together with the fact that Malta is a major tourist destination, receiving 1,807,269 tourists in 2015, further exacerbates the problem of congestion which is most evident in the Northern and Southern Harbour regions.

Currently there is no direct link between the ferries and the bus transport in Valletta, making the service heavily under-utilised. The current infrastructure further hinders an increase in patronage due to the topography and the steep hill from the ferry landing site in Marsamxett to the city centre. The objective of this measure is to better connect the two points and create an integrated PT system which is more accessible and user-friendly for tourists and residents alike.

TM will coordinate the piloting of a new PT route to connect the ferry landing sites with the city centre. The route will be served through one minibus retrofitted to LPG and ITS applications will be installed, making the service even more accessible. Once implemented, this will be the first intermodal real time information system in Malta.

MAL 7.1		
Target group	**Needs**	**Goals**
Tourists/ visitors and Residents	– Connect ferries and buses services (integrate PT system)	– More attractive tourist destinations and PT satisfaction

	– Add real time information system in the intermodal service	– Raise awareness towards alternative modes of transport – To improve PT attractiveness – Decrease rented car in city centre

Table 10– Malta Needs and Goals

2.4.2 Key Stakeholders

The below list of stakeholders have been identified for consultation for MAL 7.1 (Further integrate ferries into the PT network):
Transport Malta is the lead partner for the further integration of the ferries into the PT network measure and will see to the overall design and implementation of the measure. The Valletta Local Council and the University of Malta will provide assistance and guidance according to their area of expertise. The Ministry for Sustainable Development, Environment and Climate Change, which is responsible for LPG and alternative fuels, will be consulted during initial stakeholder consultations as well as at the bus conversion stage. The Ministry for Transport and Infrastructure and the Malta Tourism Authority will also providetheir support. Below is a list of the main governmental stakeholders identified for this measure:

Stakeholder		MAL 7.1
Ministry for Sustainable Development, Environment and Climate Change	Power	High
	Interest	High
Ministry for Transport and Infrastructure	Power	High
	Interest	High
Ministry for Tourism	Power	High
	Interest	High
Transport Malta	Power	High
	Interest	High
Malta Tourism Authority	Power	High
	Interest	High
Valletta Local Council	Power	Low
	Interest	High

Table 11– Malta Stakeholders

Below is a list of the main stakeholders from the business sector identified for this measure

- Marsamxetto Ferries
- Minibuses Co-operative
- Malta PT

Transport Malta has compiled a list of stakeholders who will be directly/indirectly impacted by the measure. Initial stakeholder consultations have started being carried out in order to compile and analyse user needs and assist with baseline data collection. This will help with the design of the bus route and the specifications for the ITS system.

A study will be commissioned to assess how accessibility from the Marsamxett ferry landing site to central Valletta can be improved. The study is required to identify which technology should be used, in which part of the fortifications the intervention can be carried out (if any are required at all), estimate the costs and analyse feasibility. A tender is currently being drafted for commissioning this study. Prior to this, Transport Malta was involved in discussions with the partners of this measure in order to define the weighting systems for the selection process.

2.4.3 Target User Groups

The target group of this pilot initiative are the tourists visiting Valletta and the major attractions in Cottonera and the nearby touristic resorts of Sliema and St. Julian's. The local residents will also benefit from better connections since Valletta is a major employment node with more than 7% of the total national employees. This fact explains the heavy congestion experienced during the peak morning hour when there is an influx of workers commuting towards the city. The region currently generates 18,076 inbound trips/km^2/hour and 12,709 outbound trips/km^2/hour during the morning peak. Therefore, improving on a system which encourages commuters to shift from land to sea transport will greatly contribute towards the reduction of congestion within the region. Maritime ferry services have a great potential in reducing such congestion and increasing the national modal split which currently stands at just 1% for ferry.

2.5 Rethymno

2.5.1 Recognised needs and goals

Rethymno has two measures within WP7, (RET 7.1) - Introducing electric vehicle for PT and (RET7.2) - Improved PT for tourists and citizens. Both measures target residents and visitors, while specific group of users are identified per measure, such as cruise visitors, students and disabled people. The overall goal is the upgrade of the current PT system and services and the behavioural change towards collective passenger transport. The following table presents the recognised needs and corresponding goals per target group.

RET 7.1		
Target group	Needs	Goals
Tourists/ visitors (including eco-tourists)	– New round route to facilitate sightseeing in the city centre and access to the beach	– Improve the environmental profile of the city – Increase use of PT amongst visitors
Residents of Rethymno	– Reduce CO_2 emissions – Increased use of clean fuels – Launch of electric vehicles in PT in the region	– Promotion and uptake of electromobility – Behavioural change of residents – Promotion of sustainable mobility modes
People with disabilities	– Accessible PT routes amongst key attraction points in city centre	– Improve mobility and accessibility for disabled people – Increase inclusion
University students	– Alternative PT transport options for the University community	– Familiarisation of the young generation with EVs – Promotion of sustainable mobility modes
RET 7.2		
Target group	Needs	Goals
Tourists/ visitors (eco – tourists)	– Reduction of car hire – Thematic routes for specific	– Improved mobility options and services for tourists

	groups of visitors (eco-tourists) – Convenient PT schedules	– Improved comfort and satisfaction of the PT users – Promotion of local alternative tourism and increase of eco-tourists
Cruise visitors	– Better connection with key attractions and regional areas – New routes to cover needs of one day visitors	– Increase satisfaction of cruise visitors – Increased use of alternative modes
Residents of Rethymno / PT users	– Attractive PT services and sufficient links between modes	– Increase PT use and satisfaction of users
PT, municipal and private fleets	– Reduce CO_2 emissions and noise – Reduce road accidents	– Raise awareness and increase capacity on eco and safe driving amongst drivers
People with disabilities	– Accessible PT services and routesin the region	– Improve mobility and accessibility for disabled people – Increase inclusion

Table 12– Rethymno Needs and Goals

2.5.2 Key Stakeholders

Stakeholder		RET 7.1	RET 7.2
PT Operator - KTEL	Power	HIGH	HIGH
	Interest	HIGH	HIGH
Regional Unit of Rethymno	Power		HIGH
	Interest		HIGH
Hellenic Institute for Electric Cars	Power	HIGH	
	Interest	HIGH	
Region of Crete -Directorate of environment and spatial planning	Power	HIGH	
	Interest	HIGH	
Hoteliers Association	Power	LOW	LOW
	Interest	HIGH	HIGH
Chamber of Commerce and Industry of Rethymno	Power	HIGH	
	Interest	HIGH	
Association of Citizens of the old town	Power	LOW	
	Interest	HIGH	
Region of Crete -Directorate of Tourism	Power		HIGH
	Interest		HIGH
Municipal Tourism Board	Power		HIGH
	Interest		HIGH
Municipal Port Authority Trust of Rethymno	Power		HIGH
	Interest		HIGH
Association of Travel and Tourist Agencies, Tour Operators	Power	LOW	LOW
	Interest	HIGH	HIGH
Association of Tourist Bus Drivers	Power		LOW
	Interest		HIGH

Parents and Teachers associations - School boards	Power		LOW
	Interest		HIGH
University of Crete	Power		HIGH
	Interest		HIGH

Table13– Rethymno stakeholders

The key stakeholders of measure 7.1, essential to the implementation and operation phase (local PT operator and the Hellenic Institute for Electric Cars), are already cooperating with the local partners.

Rethymno Municipality is planning to rent an e-bus that will be used for the pilot demonstration. Collaboration with the local PT operator is foreseen for the introduction of more e-buses and hybrid buses and their proper incorporation into the PT fleet after the pilot project ends.

Furthermore, the municipality is going to buy an e-car that will be used for the needs of the technical department.During the measure lifetime, the Hellenic Institute for Electric Cars, will provide advice when necessary, support communication activities and promote the Rethymno example nationally.

During this measure, cooperation is also foreseen with transport planners for proper design and implementation actions, as well as cooperation with hotels, travel agents, and tourism stakeholders to inform and promote the pilot beach route/e-bus route to tourists. Promotional material will be displayed at their facilities; this will emphasise the environmental benefits to tourists. The engagement of local citizens associations aims to promote the use of the beach route to citizens, challenging car free lifestyle.

For the implementation of measure 7.2, the early engagement of the PT operator is essential to achieve the upgrade of the existing PT services and the efficient cooperation for the design of new routes. The cooperation with the PT operator contributes to the operation of new routes and schedules and to the redesigning of the bus stops.

After several meetings concerning the planned activities, opportunities and challenges, the PT operator agreed to collaborate on the fulfillment of the measure. The improvement of the PT services is in the best interest the PT operator and PT users. In order to succeed, there will be further consultation with other stakeholders from the tourism sector.

Cooperation with PT drivers and the Association of Tourist Bus Drivers is foreseen for participation in the safe eco driving sessions. Hotels, tourism authorities and citizen associations will provide support to the adequate participation of citizens and tourists in surveys to measure satisfaction along with the promotion of the new routes and services.

2.5.3 Target User Groups

The target user groups include:

- Residents of Rethymno
- Tourists/Visitors (eco tourists) and Cruise visitors
- People with disabilities
- Students (during the winter time)
- PT drivers

2.6 Elba

2.6.1 Recognised needs and goals

Elba general problems/needs

Elba road network is suitable for residents' needs, but it is overcrowded during peak season, where a total of around 43.000 cars circulating along the island's roads have been recorded. The road network is structured along two main axes connecting Portoferraio with Procchio and Campo nell'Elba municipalities on one side, and with Porto Azzurro, Capoliveri and Rio municipalities on the other side.

In the tourist season these road axes are crowded by tourist cars and freight vehicles arriving at Portoferraio and Rio ferry terminal and going to different parts of the island.

The main problems affecting island mobility and accessibility are:

- Concentration of arrival/departure traffic flows in Portoferraio (where the main ferry terminal is located) resulting in congestion in the central part of the island and in a general de-qualification of tourist centres and reduction of island accessibility; traffic congestion (more than 2 thousand cars every day during peak season) along the unique road that connects the two main Ports in Rio Municipality (Cavo and Rio Marina);
- Very high percentage of people using private vehicles for island mobility (private car is used by 80% of tourists), resulting in significant congestion in the summer period, that cause difficulties in mobility, high level of pollution and several other related issues;
- Very high traffic flows concentrated in the inner city centres of the different municipalities due to the peculiar characteristics of the island road network;
- Low use of PTs services (only 14% of the PT offer). The mobility offer is fragmented in terms of ticketing, information, marketing, accessibility and cooperation and it is ineffective in providing integrated solutions able to comply with emerging needs and requirements.

It is clear that the problems mentioned above produce a wide range of related issues that negatively impact the overall quality of the environment, citizens' lives and tourists' stays, such as, among the others:

- Traffic congestion in the city centres of the 7 Municipalities;
- Parking difficulties and consequent unauthorized parking on the most important beaches;
- Noise pollution and road safety issues;

Furthermore, PT services (mainly the extra urban ones) have often to deal with significant passenger increase in the summer period (over 30% increase during the peak season) and may be inadequate to duly respond to the increased demand, thus pushing passengers to make use of different (private) means of transportation.

Elba Island strategic goals

The general objectives of the Elba Island DESTINATIONS project include the integration of sustainable mobility solutions for the needs of both residents and tourists in order to reduce private car use, thus improving mobility and living on the island.

In summary, the overall objectives of the project are:

- Improved local mobility, particularly in the summer, with reduced use of private vehicles and greater use of environmentally friendly forms of mobility;
- Emission reductions / increased air quality;
- Reduction of energy consumption;
- Increase of the overall urban accessibility;
- Improvement and increase of the use of PT.

Portoferraio and Rio Marina user needs

During the 5 workshops/assemblies held in Portoferraio and Rio Marina for the DESTINATIONS project's illustration and citizen involvement, the situation of the Elba PT service was examined.

The results confirm that PT service problems and user needs in the island concern the low frequency and the poor quality of the service. On the other hand, the low use of PT (especially in the winter) does not lead the service provider to invest very much in its upgrade.

Other problem is the difficulty in buying the bus tickets in the local stores due to the fact that they have no interest in selling these because of the low profit margin and the need to pay for the tickets for sale in advance. Citizens asked for the possibility of expanding the options for buying bus tickets.

Citizens confirm the need to keep the paid shuttle service from the residential centres at the end-of-day beaches for each summer in order to reduce the traffic and crowding of the parking lots.

ELB 7.1		
Target group	**Needs**	**Goals**
Tourists/ visitors and Residents	– Improvement of PT service (especially in summer)	– Reduce private car use – Emission reductions / increased air quality – Reduction of energy consumption – Increase of the overall urban accessibility – Improvement and increase of the use of PT.
ELB 7.2		
Target group	**Needs**	**Goals**
Tourists/ visitors and residents	– Improve PT payment solutions (integrated payment)	– PT payment by SMS – Improvement and increase of the use of PT.
ELB 7.3		
Target group	**Needs**	**Goals**
Tourists/ visitors and residents	– Improve information system in PT service	– Improvement of quality of life – More attractive tourist destinations and PT satisfaction

Table 14– Elba Needs and Goals

2.6.2 Key Stakeholders

Stakeholder		ELB 7.1	ELB 7.2	ELB 7.3
CTT Nord	Power	high	high	low
	Interest	high	medium	low
The municipalities of Portoferraio and Rio Marina	Power	medium	medium	high
	Interest	high	high	high
The Province of Livorno	Power	high	medium	low
	Interest	high	medium	medium
Providers of seasonal transport services to tourists to the beaches	Power	low	low	medium
	Interest	medium	medium	high

Tabla 15– Elba stakeholders

Main stakeholder engagement

A specific meeting was held in Portoferraio in May with all stakeholders interested in improving the mobility of the island of Elba. Part of the meeting was dedicated to conventional transport services. This was attended by local PT managers and the Province of Livorno who declared themselves interested in collaborating on the development of the project.

In addition, an agreement was signed between the municipalities of Portoferraio and Rio Marina and the local service provider to make some improvements to the PT service.

2.6.3 Target User Groups

The WP7 measure users are the resident citizens and the tourists using conventional PT services as well as those using the shuttle services to go to the beaches during the summer season.

2.7 Summary of user needs analysis and requirements at site level

There are three main categories of WP7 stakeholders among each Civitas DESTINATIONS site.

- The first group is closely related to PT management, development and operation.
- The second group is related to tourism particularly in encouraging tourists to use PT.
- The third group form different types of public administrations (local as well as regional)

Apart from these three main categories, each site will engage other stakeholders more focused on the development of their own measures. (e.g. Madeira and Las Palmas de Gran Canaria will engage education stakeholders while Madeira and Rethymno will involve the Chamber of Commerce).

In Elba, some stakeholders related to tourism are missing. As such, the main stakeholders just comprise transport companies and public administrations.

Most measures are designed to solve problems related to mobility and to offer better and more attractive PT to citizens and visitors. This includes urban PT users as well as people who do not currently use PT, but could become PT users due to Civitas DESTINATIONS measures.

3.Demonstration of Improved Public Transport Services for Tourists &Residents

3.1 Collaboration among DESTINATIONS Sites/partners

	Best Practice requirements: user needs, stakeholder involvement or measure design?	Supplier of BP?	Measures with synergies	Details of planned exchanges between measure leaders
ELB 7.1	- BP to know how the other PT operators/authorities have developed new bus stop shelters. - BP in beach services acquisition/operation	Guaguas, HF	MAD 7.2, LIM 7.1, RET 7.2	
LIM 7.1	- Installation of bike ramps on buses will encourage the use of PT with cycling in the region	HF	MAD 7.2, ELB 7.1, RET 7.2	
LPA 7.1	n/a			
MAD 7.2	- Best practice with tourist market: o Information package o Touristic tariffs o Cross selling strategies o Specific communication campaign at hotels o Cultural agenda and PT service · Role of intermodal solution and touristattraction · Information strategies at airport · Information strategies with tourist operators and travel agencies · Ticket selling agents strategy	Guaguas, HF	ELB 7.1, LIM 7.1, RET 7.2, MAD 3.1	
MAL 7.1	n/a			
RET 7.2	- Identification of transport needs of the guests from cruises; Design of services/packages for cruise visitors, how to link with sustainable mobility choices - How to build efficient assessment studies for existing PT services; methods, surveys, questionnaires, tips, lessons learnt (tourists, citizens) - Efficient campaigns/materials to drive behavioural change with regard to eco/safe driving; available training content. - Business models related to specialised PT services (cruises, seasonal routes, et.al) - Examples and ideas about smart / attractive bus stops – signage; relevant equipment - Ideas to upgrade PT ticketing system, serving better visitors needs	HF, Guaguas, LTC, TM, UoM, META GROUP	MAL 7.1. MAD 7.2, LIM 7.1, ELB 7.1	

Table 16– Best practice and knowledge exchange matrix Task 7.4

There are identified synergies between measures of Madeira, Elba, Limassol and Rethymno within this task where improvement of PT services will carry out in terms of routes, timetables, ticket, etc.

Guaguas Municipales carried out a reorganisation and optimisation of its network in 2013 (where free transfer between buses was set up and routes and timetables were improved) and thanks to that, urban PT travelers have increased. Furthermore, Guaguas Municipales is involved in the development of a new urban PT high capacity system, also known as BRT or “MetroGuagua”.

Experiences, procedures and ideas of what Guaguas Municipales has carried out and is implementing to improve the urban PT service can be share with Civitas DESTINATIONS partners through technical workshops.

3.2 ELB 7.1 Improved Public Transport services for tourists

3.2.1 Measure Design

3.2.1.1 Detailed Description of Measures to be implemented including city context

Elba Island is located around 10 km far from the Tuscan coast and is the 3rd biggest Italian Island, with an overall area of 223 square km. It is the main Island of the Tuscan Archipelago. ELBA counts a total of around 33.600 residents (2009), which almost doubles during the tourist season. Elba territory is divided into 7 municipalities, which all belong to the Province of Livorno. These are: Portoferraio, Campo nell’Elba, Capoliveri, Marciana, Marciana Marina, Porto Azzurro and Rio (After a referendum held in October 2017 and the following regional law 65/2017, the municipalities of Rio Marina and Rio nell’Elba were merged in one, creating the Municipality of “Rio”.)

Although only two municipalities Portoferraio and Rio Marina are partners of the CIVITAS DESTINATIONS project (since they are ports connected to the continent and are therefore most concerned with mobility problems) most of the measures concern the entire island of Elba

Figure 2– Administrative organisation of Elba

The measure ELB 7.1 Improve PT services for tourists covers a number of actions to improve PT services for tourists to which residents can also benefit.

The main actions were addressed to the public operator on the island (CTT Nord) and partly to the PT operator (TIEMME) on the mainland connecting the Venturina railway station to the boarding port (Piombino) for the island.

Another important action will be to increase the seasonal transport services for tourists and residents from the centres of Portoferraio and Rio to the surrounding main beaches. These services are planned to start from summer 2017 and the objective is to expand and increase them in terms of frequency and destinations starting from summer 2018.In particular regarding Rio Municipality (where there are two of the three main ports present in Elba), in order to improve mobility for tourists and residents during summer season, we want to decrease the use of private cars along the unique street that connects the two main ports in our municipality (Port of Cavo and Port of Rio Marina). During peak season we have more than two thousand cars every day along this unique road artery creating traffic congestion. Our aim is to decrease the use of private cars offering a functional public transport service to connect ports and the main touristic destinations (beaches, centers of towns, port).

After a negotiation conducted by the municipalities of Portoferraio and Rio Marina and with MemEx's active collaboration, an agreement was signed with both CTT Nord and TIEMME, where the two companies and in particular CTT Nord are committed to:

- Agree a review of the route of the various PT conventional lines on the island and their frequency.
- Improve the quality of the service in terms of punctuality and efficiency of the means of transport.
- Provide information through the Advanced Vehicle Monitoring (AVM) system to the users both by means of information panels at stops and through a dedicated Appin Italian and English.
- Gradually activate the indication of routes and stops on vehicles.
- Specific collective services for tourists during the summer period.
- Gradually activate the Wi-Fi network on new cars in service.

3.2.1.2 Project Partners working on measure, roles and responsibilities

The Municipality of Rio Marina has coordinated the economic technical agreement with the two public provider companies CTT Nord and TIEMME assisted by the Municipality of Portoferraio. This is in regard to the realization of user needs that have been highlighted by the surveys.

MemEx made a major contribution by promoting the convention between the municipalities of Elba, the transport companies and the Province of Livorno (promoter of PT) and suggesting the contents.

The Municipality of RioMarina, supported by the Municipality of Portoferraio and MemEx, will be responsible for realizing the outcome of discussions at the convention.

3.2.1.3 ITS Technology, system or service requirements

The AVM system, in addition to permitting the operator to control the fleet, can also provide real-time information about the arrival of buses at various stops.

CTT North already has this system on board its vehicles, but at the moment does not provide information to users through specific panels or APP. In the agreement signed CTT Nord has undertaken to provide this service.

TIEMME is also committed to providing real-time information about the various ferries departing from Piombino harbour to the island.

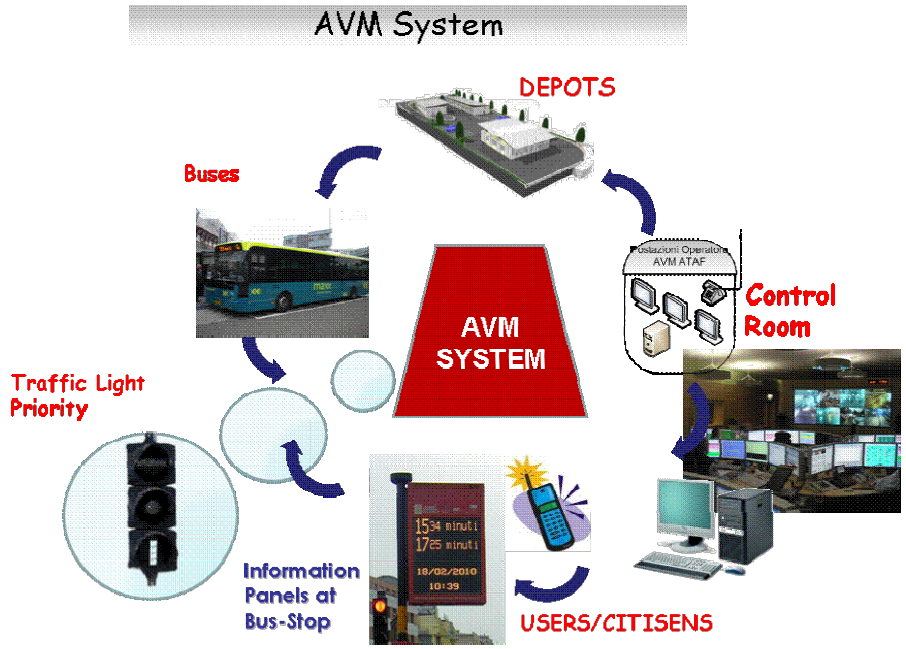

Figure 3 – ELB 7.1 AVM system

3.2.1.4 Procurement of services

The real-time user information was provided in the agreement between Portoferraio and Rio Marina and CTT Nord. The financial offices of these municipalities have drawn up the assignment contracts that have been approved by the related town councils.

For the transport of tourists and residents to neighbouring beaches, both the municipalities of Portoferraio and Rio Marina have already drawn up call for tenders for the assignment of the service. For this basic service to reduce the use of private cars, some extra races that increase the frequency at peak hours will be funded by the DESTINATIONS project

3.2.2 Measure ex-ante evaluation

The ex-ante evaluation (i.e. the expected results at the end of the project due to the implementation of the related measure) was listed in the category of impacts towards the transport system and society and analysed on the basis of three impact indicators: utilisation level, system performance and citizens'satisfaction with the transport system.

The AVM system that is expected to be installed on the basis of the signed agreement between CTT (PT provider) and PF and RM will allow more control of bus regularity, reporting real trip time and will give users information on the buses' arrival times. This measure will make PT more efficient and attractive for both residents and tourists. Thanks to the AVM installation, the greater efficiency of PT will be measured according to the service performance indices (punctuality and number of lost trips)

The ex-ante estimation for PT utilization is an increase of 10% of the PT users (i.e. from the present 700.000/year to 770.000 /year).

It should be noted that the estimate is very challenging as in recent years the trend has been a reduction in the PT user mode share.

Regarding the system performance concerning the timeliness of the service, an excellent result of 98% isestimated.
User satisfaction is estimated to increase from the current 30% to 60%.

3.2.3 Implementation Plan

The first milestone concerns the user needs collection and analysis. Numerous inquiries were made (M6) and a survey of students of all Portoferraio schools was undertaken to understand the greatest problems and needs regarding PT.

The user needs analysis led to the definition of the agreement between municipalities and service management companies (M8)

Before month 12, meetings between municipalities and PT providers will be held to agree the actions to be defined on the agreement base. The agreement covers:

b) Payment Instruments and Packages Integrated within the WP6 T6.1- WP7 T7.2 project measures:
b1. Launch of urban and interurban payment by SMS; and
b2. Definition of integrated mobility / stay packages for tourists**).**

c) Information to users in the WP7 T7.3 measure of the project:
C1. Using the AVM system to examine in detail the lines of exercises on the ELBA;
C2. Installation, full operation and maintenance of at least 4 panels for station information to the users;
C3 Installation, full operation and maintenance of at least 2 information panels at bus stop;
C4. Operational startup of the APP for real-time user information;
C5. Realisation of the English version of the information user's APP;
C6. Gradual activation of the routes and stops indication vehicles; and
C7. Gradual activation of the Wi-Fi network on new vehicles.

CTT is committed to activating the above measures by the end of summer 2018. Being all the system active in other areas served by CTT and the main technology already installed in the bus the PT service providers on the island

3.2.3.1 Risks and constrains

The only risk is that CTT, while having signed the agreement with Portoferraio and Rio Marina (now “Rio”) municipalities, fails to implement or delays the realization of some measures. However, to date, CTT has shown full availability to fulfill the commitments made.

3.3 LIM 7.1 Improvement of PT routes, timetables, ticket procedure and bike transportation on buses to make the service more attractive

3.3.1 Measure Design

3.3.1.1 Detailed Description of Measures to be implemented including city context

In Limassol, measure LIM 7.1 will provide an improved PT service that serves the needs of tourists and local people. Better designed routes and timetable adjustments will ensure that the service is convenient and attractive to increase the number of PT users. Bike racks will enable the combination of cycling and PT.
The local tourist information offices have been recording complaints from visitors regarding inconvenient PT routes, connections and timetables. A meeting between the Cyprus Tourism Organisation, Limassol Tourism Company, Limassol Bus Company and the representative of the Ministry of Communication and Works took place in which the recorded complains from tourists regarding the use of PT was presented. Suggestions and solutions have been made for improvement on PT routes and timetables.
The ticketing procedure will be upgraded and replaced by a new system. This will be implemented in collaboration with the Ministry Communications and Works. At least 10 PT routes and timetables will be improved and 20 bike racks will be installed on buses.

3.3.1.2 Project Partners working on measure, roles and responsibilities

In Limassol, the Limassol Tourism Company is the main project leader for this measure and will be responsible for implementing activities, leading to an improved and upgraded PT system in Limassol.

3.3.1.3 ITS Technology, system or service requirements

In Limassol, no new technology systems will be required.

3.3.1.4 Procurement of services

Data for bike rack specifications have been collected and tender documents are ready to be published according to the public procurement laws of Cyprus.

3.3.2 Measure ex-ante evaluation

For this measure, baseline data has been collected by carrying out surveys, estimations and through data collection. Limassol has identified the following impact indicators under transport and society.

1. Transport:For ‘’Accuracy of time keeping’’ there is no baseline available, since the Limassol Bus Company does not collect this type of data. It is however estimated that at least 55% of buses will arrive on time after the implementation of this measure (ex-ante).

2. Society:For ‘’Acceptance’’ and ‘’Awareness’’, it is estimated that after the implementation of this measure 65% will be aware and accept this measure (ex-ante). There is no baseline for this measure under the acceptance and awareness impact indicators since it has not been implemented yet. The ‘’Citizens satisfaction on public transport’’ impact indicator will be measured through carrying out surveys. As per the survey results of 200 participants, 14% of the population is satisfied with the PT system. It is estimated that more than50% of citizens will be satisfied with the PT network after the implementation of this measure. Finally, the impact indicator on ‘’Perception of accessibility level of service’’ is measured

using anindex of ‘’accessibility’’ perception on a 5-point scale. Most service user’s perception of accessibility level of services was rated 1 on the 5-point scale. It is estimated that after the implementation of this measure, the rate of accessibility perception will increase to 2 on the5-point scale.

3.3.3 Implementation Plan

1. Meetings with the tourist information offices to collect information (November 2016-December 2016).

A meeting between the Cyprus Tourism Organisation Information Offices and the Limassol Tourism Company took place to record information regarding tourist satisfaction on PT services. The Local Tourist Information Office has been recording complaints regarding inconvenient PT routes, connections and timetables.

2. Meetings with the Limassol bus company, the Cyprus Tourism Organisation and the representative of the Ministry of Communications and Works (December 2016- February 2017).

Several meetings with the Limassol Bus Company, representative of the Ministry of Communications and Works and tourist information offices of the Cyprus Tourism Organisation took place aiming to find solutions regarding bus timetables, routes and connections.

3. Determine specifications for bike racks on buses and permissions (May 2017- August 2017).

Specifications for bike racks have been determined and the Limassol Tourism Company is in the process of acquiring permission by the Limassol Bus Company for the installation of racks on buses.

3.3.3.1 Risks and constraints

In Limassol, no risks and constraints have been identified.

3.4 LPA 7.1 Communication for the introduction of the new Bus Rapid Transit (MetroGuagua)

3.4.1 Measure Design

3.4.1.1 Detailed Description of Measures to be implemented including city context

One of the most ambitious projects in Las Palmas de Gran Canaria is the MetroGuagua system that will connect the two most important areas of the city (where almost 75% of urban PT trips take place).

The new MetroGuagua system will have an important impact on the public space and mobility of the city. MetroGuagua will be not only an urban PT project, but also a city project, where all the facilities surrounding the BRT lane will be improved by adding cyclist lanes, and widening sidewalks and green areas in priority over provision for private vehicles.

The investment project of MetroGuagua will include:

- Dedicated bus lanes for the BRT;
- Traffic light priority at all intersections along this route;
- Real time information at BRT stops (Smart and improved BRT stops);

- Smart cards and payment before entering the vehicle; and
- Clean vehicles.

The construction works of MetroGuagua might cause some inconvenience to neighbours and visitors. For this reason, the main goal of this measure is to carry out a communication campaign in order to raise awareness of the importance and scope of the project, given that the BRT will bring economic and environmental benefits as well as facilitating an eco-friendly city where pedestrians are the main players.

With this objective, a 3D film simulating a real BRT trip (of about 4 minutes) will be recorded. Furthermore, in order to present the film on social media and other communication platforms, the film will be shot in other available versions like full or ultra-high definition (Full HD o 4K).

In addition, dedicated information sessions for target users as elder people, journalists, students or neighbourhood associations are being carried out.

3.4.1.2 Project Partners working on measure, roles and responsibilities

The main partners of Civitas DESTINATIONS working in this measure are Guaguas Municipales, the organisation in charge of urban PT services in Las Palmas de Gran Canaria and the Municipality of Las Palmas de Gran Canaria, the organisation in charge of the mobility and city planning service.

Both of them need to work in a coordinated way (so a communication commission has been established where periodical meetings are held) together with the police department, the media and Geursa (the municipal company in charge of drafting the project).

3.4.1.3 ITS Technology, system or service requirements

This measure (LPA 7.1) could be divided into two different actions.

1) Services to produce a 3D film and HD versions.

   The main output is to produce a 3D film simulating a real BRT trip (of about 4 minutes). Furthermore, in order to present the film on social media and other communication platforms, the film will be shot in other available versions like full or ultra-high definition (Full HD o 4K).

   Shooting a 3D film is a very complex and specialised task. Therefore, it is necessary to follow the recommendations of a company with experience and knowledge in this sector. So the services of a company have been contracted to prepare the tender documentation, to support Guaguas Municipales during the tender process, and to follow the works of 3D film production.

   In order to do a great 3D BRT production, a comprehensive and multidisciplinary team will be needed. For that reason, the staff will be composed of several professionals as film producer, light and sound technicians, actors, makeup artists, musicians, etc.

   It is expected that more than 100 people will be involved in this production. Moreover, technical equipment as camera car, HD drones, movie set, etc. will be used.

2) Dedicated sessions for target users.

MetroGuagua construction works have been phased to avoid or reduce the inconvenience caused to citizens and residents. For each of these phases, a specific mobility plan of the area will be developed (to make neighbours' mobility easy during and after the works phases).

To be able to explain those mobility plans and all the issues related to MetroGuagua system, dedicated sessions for target users are being carried out.

Some of the target users that are attending these sessions are:

- Stakeholders;
- Schools, nurseries, students, parents;
- Journalists;
- Neighbourhood associations; and
- Elder associations.

3.4.1.4 Procurement of services

It is expected to publish a tender process in summer 2017 to subcontract the services of an expert company to carry out the 3D film.

3.4.2 Measure ex-ante evaluation

For this measure, baseline data will be collected by estimations and by carrying out surveys. Las Palmas de Gran Canaria has identified the following impact indicators that will allow the evaluation of the measure's implementation under the Society category: Awareness and Acceptance.

- Awareness: Index of "awareness" about the new BRT (Likert scale). Awareness in terms of the percentage of citizens and tourists that are aware of the new BRT system. The goal is to increase citizens' and tourists' awareness of the new BRT system (MetroGuagua) and the level of awareness after the measure implementation is expected to increase by 10%.
- Acceptance: Index of "acceptance" about the new BRT (Likert scale). The goal is to increase citizens' acceptance of the new BRT system (MetroGuagua)and the level of acceptance after the measure implementation is expected to increase by 10%.

Impact category	Impact indicator	Unit of measure	Baseline	Ex-Ante
Society	Awareness	Index of "awareness" about the new BRT (Likert scale)		Increase of citizens' awareness on the new BRT
Society	Acceptance	Index of "acceptance" about the new BRT (Likert scale)		Increase of citizens' acceptance of the new BRT

Table 17– LPA7.1 ex-ante evaluation

3.4.3 Implementation Plan

The measure will be implemented in different stages depending on the development of the MetroGuagua constructions works.

1. 3D film development (July 2017 – September 2018)

For the production of the MetroGuagua 3D film, Guaguas Municipales has already contacted an expert in this kind of film technology to get support with the tender and production process (the tender process expected to be undertaken in summer 2017). The public launch of the 3D film is expected in September 2018 so the rest of the phases of the 3D film will depend on the conditions of the company that wins the tender process.

2. Dedicated Sessions for target users and meetings with stakeholders (June 2017 – 2021)

Regarding the dedicated sessions for target users, the number of meetings held, will depend on the numbers of schools, stakeholders and associations related to each section of the MetroGuagua project.

For example, in June 2017, the two first phased works of MetroGuagua system started, so in parallel, meetings with neighbours, schools, stakeholders and journalists took place.

Furthermore, there have been other meetings and events to explain the project at public level.

- 24/11/16 Public event to officially present MetroGuagua to the citizens.
- 15/02/17 Signature of a loan with the EIB for the MetroGuagua project.
- 15/05/17 Meeting with the Media to explain the project.
- 19/06/17Meeting with schools to explain the project and specific mobility plans for BRT works.
- 20/06/17 Meeting with schools to explain the project and specific mobility plans for BRT works.
- 23/06/17 Meeting with the media to explain specific mobility plans for BRT works.

For those meetings, audiovisual material and a model of the MetroGuagua route has been produced.

Figure 4 – LPA7.1Audiovisual material for dedicated sessions to target users

3.4.3.1 Risks and constraints

The communications activities of MetroGuagua is strongly linked to its construction works, so any delay, changes or issues related to the works may directly affect the communication strategy and planning.

3.5 MAD 7.2 Attractive public transport

3.5.1 Measure Design

3.5.1.1 Detailed Description of Measures to be implemented including city context

Attractive PT is regarded by the PT operator Horários do Funchal, as well as other regional authorities, as of paramount importance, to push tourists to choose PT and avoid private modes of transport for their leisure trips during their visit. Promotion of car rental and other private transport services are nowadays very aggressive, and some of them communicate a poor image of PT services, so it is essential to have a persuasive PT communication and commercial strategy, capable of being competitive with other modes.

By targeting tourists when they arrive in Madeira (either in the airport or in the port) or even before landing in Madeira (using social media for example) one aspires that they use less energy and environmentally damaging modes of transport.

To turn PT into a more attractive service, a set of actions/outputs ought to be implemented, as outlined in the bullets below:

- Redesign bus stops layout, to be more comfortable and attractive in order to reduce the perception of the bus waiting time. This intervention will target three areas where local partners feel that resources will impact most, namely the touristic areas of Monte, Botanical Garden and Pico dos Barcelos (a popular viewpoints);
- Punchy/commercial videos about what to do in Funchal using public transportation. These videos will be displayed on regional TV, in the main gateways of entrance, in the stakeholders websites and also at tourism fairs;
- Development of inspirational videos to be used at specific training campaigns targeting bus drivers. These videos are expected to guide bus drivers and other PT staff towards a more commercial approach focusing on clients' expectations and needs;
- Better image and look of the PT company's "front office" to combine tourism and transport information and back-office as well (e.g. using a platform to sell tickets online);
- Use of smart marketing techniques through social media to showcase the activities implemented and also to collect opinions and suggestions;
- Promotion of touristic events on buses and bus stops;
- Installation of 5 interactive panels in the PT Operator sales and information outlets (Teleférico, Pinga; Alfândega; Marina and Anadia); and
- Installation of one digital mupi in the port facilities or nearby.

3.5.1.2 Project Partners working on measure, roles and responsibilities

Partner short name	Activities description
HF	HF is directly responsible for the coordination and realisation of the measure.
SRETC	Will support some of the other measure actions.
CMF	Is the partner mainly responsible for carrying out the interventions at bus stops and will support some of the other measure actions.
MEMEX	Considering that there are several technological equipment, the project ITS leader will be a focal contact point
GUAGUAS	WP7 leader
Rethymno Municipality	(RET 7.2) - Improved PT for tourists and citizens
Rio Marina Municipality	(ELB 7.1) - Improve PT services for tourists

Table 18– MAD 7.2Project Partners working on measure, roles and responsibilities

3.5.1.3 ITS Technology, system or service requirements

At a first stage, several technology-driven actions will take place in the frame of this measure. Below is a list of actions where technological solutions will be sought:

- Innovative/interactive digital systems to manage queues at HF selling desks, with virtual tickets and with the ability to increases the effectiveness of marketing and advertising campaigns;
- CMF will most likely seek forward-looking solutions for bus stop improvements in three designated areas, Pico dos Barcelos, Monte and Jardim Botânico (Botanical Garden) (liaison with measure 3.1.) and the west part of the city were tourists are mainly located;
- Creative videos (both for training and for commercial purposes) will be produced upon tender;
- Interactive panels will be developed with the help of students from Madeira Interactive Technologies Institute so that human-computer interaction can be better explored;
- HF will contact national and international suppliers of digital mupis; and
- HF will either develop its own online selling platform or adhere to an existing one.

3.5.1.4 Procurement of services

A joint procurement of digital mupis is being considered as SRETC intends to purchase one mupi themselves. This initiative could help to decrease unitary costs related with the implementation and installation of the equipment.

In addition to the above, the purchase of equipment and the launch of subcontracting processes will follow what is foreseen in the measure description, that is to say:

HF (Sub): “Service to develop PT service (videos, social media, thematic routes, etc.) (35,000€).”

HF (OGS): “Materials to promote PT service, on bus stops, buses, and others points of interest” (35,000€).

HF (Equi.): “Equipment for the front office” (43.000€). This equipment includes 5 digital panels and two mupis, video surveillance cameras for HF sales and information outlets and a queue management system).

CMF (Sub.): “Communication support and small infrastructures for bus stops refurbishment” (50,000€)”.

CMF (Equi.): “Awareness campaigns to promote public transport” (38,000€).

3.5.2 Measure ex-ante evaluation

Impact category	Impact indicator	Unit of measure	Baseline	Ex-Ante	Target Group
Society	Satisfaction rate with the queue management system targeting PT users *(CIVITAS Core Indicator 41 - citizen satisfaction with transport system)*	%	Due to be collected by August 2017	new target (not in GA):	PT users (both tourists and locals)
Society	Satisfaction rate with the queue management system targeting PT staff *(CIVITAS Core Indicator 41 - citizen satisfaction with transport system)*	%	Baseline will be collected retrospectively in M 25	new target (not in GA):	PT front office staff
Society	Satisfaction rate with the new information supports (digital panels and mupi) *(CIVITAS Core Indicator 41 - citizen satisfaction with transport system)*	%	Due to be collected by August 2017	new target (not in GA):	PT users (both tourists and locals)
Economy	Revenues of touristic tickets (daily ones) *(CIVITAS Core Indicator 1 - average operating revenue)*	€	*Data from tickets sold in 2016 will be introduced by May 2017*	+ 10% revenues of daily tickets	PT users
Transport system	Number of PT user (tourists and residents) *City specific indicator*	pax (derived from nº of tickets sold)	*Data from tickets sold in 2016 will be introduced by June 2017*	+ 10% tourist PT users (average of 6.000 tourist passengers riding PT per day)	Tourists using PT service
Society	*CIVITAS Core Indicator 40 - acceptance level* of the new training videos	%	Baseline is zero as the product is new	new target (not in GA): At least 80% of drivers stating that videos are useful or very useful (Likert scale) for their profession	PT drivers
Society	*Number of views of the promotional videos (CIVITAS Core Indicator 39 - awareness level)*	n.º	Baseline is zero as the product is new	new target (not in GA):	Tourists / PT users

Table 19– MAD 7.2 ex-ante evaluation

3.5.3 Implementation Plan

The first twelve months of the project were instrumental for carrying out small incentive campaigns to see how the effect on demand and how far it is possible to create a mind-shift among regular private transport users. This was the case of the “bring a friend campaign” which was implemented, evaluated and disseminated though local, regional communication channels, but also through the CIVITAS one (see, for example, the CIVITAS MOVE newsletter 30 where these activities were reported). Other communication materials were produced and are displayed below:

Figure 5 – MAD 7.2 Campaigns

This measure entails several technological products that were benchmarked and investigated throughout the design and specifications phase. Even though no tender procurement drafts were written, some research work was carried out and can be breakdown and described below making the match with the designated tasks:

Mil.	Milestone /activity description	Concluded?	Month forecast	Current situation
	Design and specifications		*1-8*	
7.2.1.	Define the monitoring system and collect a baseline	Y	1-5	Contribution to the draft evaluation plan.
7.2.2.	Market survey on new ITS tools (innovative software to manage queues; surveillance cameras; online platform, digital panels and mupi). Analysis of technical requirements	N	1-5	HF has contacted several technology suppliers but no equipment has been purchased yet. The current situation is as follows: *Digital mupis* – HF wishes to purchase not one but rather two digital mupis, one indoor and the other one outdoor. *Queue management system* – the system should have already been implemented but it is delayed. The company is considering many options among manufacturers and procurement (e.g. renting vs purchasing). *Interactive panels* – the purchase will be performed as soon as the software is decided (and the software which will be used will be the one which the website is based upon). *Video surveillance cameras* – purchase is being postponed so than the cameras can fit both MAD 7.2. and MAD 3.1.purposes.

				Online selling platform – it is linked with the website whose tender has not yet been launched. *Videos* – there has been some meetings to define the training video script but nothing has been formally decided yet. Aside from technological equipment, HF has also worked in another action during this preparation phase: *Bus stops* – HF has already redesigned the communication at some bus stops in the city centre that are served by buses that give tourists access to some of the most notable places around the city.
	Communication and dissemination		*1-42*	Horários do Funchal has implemented, evaluated and disseminated the "bring a friend campaign". The company has also launched a "children's day" promotion, in which free bus services are offered to children's during the month of June (locals and tourists alike, as all information materials were translated into English). The company has also signed a cooperation protocol with the municipal company who manages the access to the local beaches, so that beach users who take the bus are granted discounts.

Table 20– MAD 7.2 Implementation Plan

3.5.3.1 Risks and constraints

The relationship between this measure and others can delay the purchase of some equipment that can be used for more than one measure (e.g. surveillance cameras) or that severely rely on other measures (e.g. the online platform to sell tickets).

3.6 MAL 7.1 Integration of ferries into the Public Transport

3.6.1 Measure Design

3.6.1.1 Detailed Description of Measures to be implemented including city context

TM will coordinate the piloting of a new PT route to connect the ferry landing site in Valletta with the city centre. A number of possibilities exist on how the current access from Marsamxett ferry landing site to central Valletta can be improved. As part of the initial stages of this pilot, a study will be commissioned to assess all possibilities and identify the most viable option. The study is essential to estimate costs and feasibility, identify technology needs and the interventions to be carried out.

The pilot will have three cycles which will best assess actual demand for the service. Each of the cycles will target different peaks of tourist travel as well as residents' commuting needs. The first cycle will coincide with the spring seasonal tourism peak; between mid-March and mid-April. The second cycle will be between mid-July and mid-August, covering the summer peak and the third cycle will target resident's demand covering mid-October to mid-November. This is the period when schools reopen after the summer recess and congestion is rampant. The cycles were chosen specifically to avoid sporadic mobility demand, such as during the Christmas period, which give an unrealistic view of general commuting patterns and demands.

Data monitoring of travel patterns during the three pilot cycles will be able to determine whether a full year operation should be put in place or, in case of low demand, whether a seasonal operation should be considered. The data will also be used to fully design an Action Plan including implementation timelines and the budget needed. This will be included as part of the measures forming part of the SUMP (WP2).

The objectives of this measure are to encourage a sustainable transport behaviour and instigate a modal shift from private vehicular transport to PT for both tourists and locals. The measure will improve accessibility and the attractiveness of PT, improve inter-modality and increase PT links. This has the potential to reduce congestion by shifting traffic from the road to the sea. The measure will deploy one new shuttle bus converted to LPG for use in the pilot.

3.6.1.2 Project Partners working on measure, roles and responsibilities

Transport Malta is the lead partner for this measure while the Valletta Local Council and the University of Malta will provide support based on their respective expertise.

3.6.1.3 ITS Technology, system or service requirements

One variable messaging sign (VMS) will be purchased and installed at the ferry landing site to show in real time the departure and arrival time of both the ferry and the bus. The VMS will be backed by the Management and Monitoring System which will be available at the Transport Malta National Traffic Control Centre which will come into effect in the medium term as part of an ERDF funded project.

3.6.1.4 Procurement of services

Transport Malta will publish a tender for the Cost-Benefit Analysis (CBA) of the possible options of connecting the ferry landing site in Marsamxett harbour to Valletta city centre. As part of this study, the most viable option will be identified and fully costed including the costs of any interventions that need to be carried out.

Another tender will be published by Transport Malta for the procurement and installation of the VMS and the related software, which will give real-time information of the ferry and bus arrival and departure times.

A separate collective service tender will be published by Transport Malta for the preparation of the promotional material for dissemination.

3.6.2 Measure ex-ante evaluation

The evaluation of the measure includes social impact indicators and data collection on the fuel consumption of the bus that will be deployed for this pilot. Surveys with users will be carried out in April 2019 (Month 32), August 2019 (Month 36) and January 2020 (Month 41).

The impact on society will be measured through surveys that will elicit:

- The level of awareness, in terms of the percentage of citizens and tourists that are aware of the new route and services provided to connect the ferry landing site in Marsamxett Harbour to

central Valletta. The level of awareness after the measure implementation is expected to increase by 10%; and

- The level of users' satisfaction with the new bus route, in terms of the percentage of users that are satisfied with the new service and infrastructure. The level of satisfaction of the users after the measure implementation is expected to be 20% of respondents who are completely satisfied.

Data on the fuel efficiency of the new bus will be collected in collaboration with the transport operator. The initial data collection exercise will be carried out prior to the conversion of the bus to LPG in December 2018 (Month 28). Further data will be collected during the pilot in August 2019 (Month 36) and after the pilot testing is concluded in January 2020 (Month 41).

3.6.3 Implementation Plan

Transport Malta compiled a list of stakeholders that will be impacted by the measure as well as those entities who can assist with baseline data collection; baseline analysis and user needs analysis. In Month 8, consultations with these stakeholders were initiated with the priority of collecting baseline data as well as designing the specifications to be included in the tender for the Options Analysis and CBA as well as for the tender for the procurement of ITS infrastructure.

A tender for the Options Analysis and CBA will be prepared and in Month 20 the expertise will be subcontracted. The study, which will be concluded by Month 27, will identify technological requirements, interventions and their costs as well as an estimation of costs and fesability analysis for all the identified options of connecting the ferry landing site with Valletta city centre.

Based on the outcome of the study, the pilot will be designed; including the publishing of a tender and the procurement of ITS equipment and installation; the conversion of a bus to LPG and the design of its operation including the mapping of its new route.

The real-time information system will be tested and verified in Month 28 and the pilot will be launched in Month 31. A press conference will be held to launch and further promote the pilot. Once the first pilot phase is launched, monitoring and data collection will start. The results obtained will be disseminated at a press conference which will mark the pilot closure.

Communication and dissemination will take place between Month 28 and Month 39. During this time, a communication plan will be drawn up and a marketing plan designed. Prior to the launch of the pilot, the promotional campaign will take off to inform the public of the new link and encourage its use.

3.6.3.1 Risks and constraints

Political involvement and support could be a challenge to obtain. By actively involving all stakeholders, particularly politicians, from the inception stage of the pilot phase this risk should be mitigated.

The requirements of users should be well understood from the early stages in order to prevent potential faults in planning. This should be supported by data collection structures that should be in place during measure piloting.

The attractiveness of PT should be improved. This pilot project will be well-promoted to address the behavior change that is required. The new bus route that will provide a connection from the ferry landing site to central Valletta together with the accompanying infrastructure with real-time information should attract new users and create a shift in the modal split for the duration of the pilot.

3.7 RET 7.2 Improved PT for tourists and citizens

3.7.1 Measure Design

3.7.1.1 Detailed Description of Measures to be implemented including city context

Many tourists and citizens tend to hire cars to reach the main attractions and sites of interest. Existing PT services are not sufficient and attractive enough; there is a lack of time punctuality and long waiting time for connecting routes. The PT services are mainly designed for citizens and do notsatisfy the needs of the tourists visiting Rethymno Municipality. Cruises visitors and one day visitors are increasing and currently the best way of visiting the main touristic attractions of the municipality is by using a taxi or renting a car. There are several beautiful rural bike routes and an increased interest in cycling. However, buses cannot support the combined use of PT with cycling in the region while there are no bike racks on the buses, thus preventing the transportation of bikes.

The measure aims to improve the PT service in the area with better designed routes, schedules and comfort. The assessment of existing PT services and infrastructure, along with the identification of tourists' interests/ needs via surveys will be taken into account to redesign appropriate itinerariesincluding the assessment of the current siting of PT, bike,EV charging and parking stations, cycle and walking paths and new insight on linkages with hotel transport needs. Within the measure, new access plans will be created for main attraction areas in the greater area currently visited mainly by hired cars. The improvementof PT timetable and infrastructure (bus stops, bike racks) along with eco driving training of the PT drivers will provide improvedPT services to residents and tourists.

Expected outputs:
- PT users' satisfaction survey (samples of citizens and of tourists);
- PT improvement study (routes and service); rescheduled PT time plan during touristic season;
- Launch of attractive - 'Smart' bus stops;
- Bike racks in selective bus routes;
- 2 new routes (1 or 3h) to key points for cruises visitors, information package, information panels;
- 2 new PT routes, including proposal for ecological walks and bio food alternatives, information package with routes, timetables, tips;
- Safe and eco driving training sessions of PT drivers. Guidebooks distributed to professional drivers of PT, municipal and private fleets; and
- Capacity building workshop of regional and national urban planners.

By making PT more convenient and attractive, tourists have more incentives to use it for their everyday trips, while the city will establish an attractive, car independent lifestyle. By reviewing and rescheduling services according to real seasonal needs, operational savings can be found during off-peak periods, whilst providing more capacity during the peak. The potential impact of rerouting buses to and from hotels offers a large potential modal shift away from more polluting modes and hired cars.

The new provision of walking and cycling infrastructure will be in accordance to the peak and troughs of demand resulting from the fluctuating tourist numbers. Also, new infrastructure will be launched to enable better mobility for disabled people at main attraction points, including infrastructure for the accessibility to beaches and the introduction of touristic day routes and tailor made maps, especially for disabled people.

More specifically, the goals of the measure are:
- Improve PT routes and timetables, improved comfort and satisfaction of the PT users;
- Increased use of PT by tourists and residents;
- Enable bike transportation on selective PT routes;
- Offer thematic routes to specific groups of visitors;
- Behavioural change of visitors to change from rent car /taxi to PT;
- Increased capacity of PT operators; and
- Improved skills and attitude of PT drivers

3.7.1.2 Project Partners working on measure, roles and responsibilities

In the table below the involved project partners and their role and responsibilities are described.

Project Partner	Role	Responsibilities
Rethymno Municipality	Measure Leader – Beneficiary	Measure implementation. Interact with the PT operator. Propose new routes, improved services. Deliver information packages and attractive PT signage.
Technical University of Crete	Measure support	Technical support. Coordination of surveys, contribution to the design information packages and promotional materials. Safe and eco driving training sessions of PT drivers and training materials

Table21– RET 7.2Project Partners working on measure, roles and responsibilities

3.7.1.3 ITS Technology, system or service requirements

Within the measure, “smart” bus stops, including electronic signage with real time information will be implemented. Rethymno Municipality, in cooperation with the local PT company, is currently finalizing the technical specifications of the “smart” bus stops. The complete description of the system will be available at a later stage (end of 2017). The installation of systems is planned for June 2018.

3.7.1.4 Procurement of services

A service is subcontracted to the Sustainable Mobility Unit of NTUA, the subcontractor of SUMP for Rethymno, in order to assess existing PT services and the current system’s efficiency including the assessment of current siting of PT, bike, EV charging and parking stations, bike/walking paths and new insight on linkages with hotel transport needs. The subcontractor will undertake the rescheduling of timetables and design new routes to respond to real needs across the year and advise on the design of 2 new routes to serve cruise visitors and the design of 2 new routes integrating ecological walk and cycling alternatives.

Another subcontract includes the service on PT user needs and satisfaction level field survey and analysis of findings.

Procurement of service is foreseen for the organisation of the PT drivers' eco and safe driving sessions, for the design of promotional materials and information package for cruise visitors and for the production of eco and safe driving guidebooks.

3.7.2 Measure ex-ante evaluation

The evaluation of the measure includes social, transport and economy impact indicators. The data collection for the measure's evaluation is planned in March 2018, August 2019 and June 2020, before, during and after the measure's implementation correspondingly.

The selected indicators are presented below.

The impact on society will be measured through:

- **The level of awareness**, in terms of the percentage of citizens and tourists that are aware of the new routes and services provided in the PT system. The level of awareness after the measure implementation is expected to increase by 10%.
- **The level of citizen's satisfaction with transport system**, in terms of the percentage of PT users that are satisfied with the PT services and infrastructure. The baseline value of the indicator will be available in August 2017. The level of satisfaction of PT users after the measure implementation is expected to increase by 10%.
- **Perception of accessibility level of service**, in terms of the user's perception of the physical accessibility of the service and how convenient it is for them to reach the nearest PT stop. The baseline value of the indicator will be available in August 2017. The level of accessibility of the PT users after the measure implementation is expected to increase by 5%.

The impact on transport will be measured through:

- **Accuracy of timekeeping**, in terms of the percentage of the total arrival times of PT vehicles that are within a given interval around the time shown in the timetable. The baseline value of the indicator will be available in August 2017. The average accuracy of timekeeping after the measure implementation is expected to increase by 25%.
- **Average occupancy**, as the average number of passengers per PT vehicle per trip. The baseline value of the indicator will be available in August 2017. The average number of PT passengers per trip after the measure implementation is expected to increase by 5%.

The economic impact will be measured through

- **The capital costs average operating revenues** and **the average operating costs** of the new PT services and infrastructure and will be defined at the end of the implementation of the measure.

3.7.3 Implementation Plan

- M1. User needs study (September2017);
- M2. Assessment of existing PT services (November2017);
- M3. Operate new/redesigned PT routes (May 2018);
- M4. Information packages, promotional materials (May 2018);
- M5. Install bike racks and attractive bus stops on selective routes (June 2018);
- M6. Study on cruise visitors interests (August 2018);
- M7. Users' satisfaction survey (October 2018); and
- M8. Suggestions for optimisation based on surveys and stakeholders findings (February 2019).

The engagement and commitment of the PT operator is crucial for the development and success of the measure. Within this scope, several contacts and meetings have taken place with the PT operator and the Sustainable Mobility Unit of NTUA in order to work together for the development of the measures, the implementation of the user needs study and the assessment of the existing PT services. The introduction of the new routes and the redesign of PT time plan will be carefully planned in order to address the real needs of citizens and visitors and to provide a comfortable and accurate service, after the assessment of the existing PT services which is on-going. Furthermore, the bus drivers' behavior and professional competence should be assessed and improved if required.

3.7.3.1 Risks and constraints

Existing behavioral inertia and car dependency could be a challenge to the success of the measure that can be addressed by the behavioral change campaign, improvement of services and time schedules, more attractive fleet and better information (real time) for bus timetables to enable change.

The improvement of attractiveness and infrastructure of the PT operator requires big investment in human and economic resources; this could be a barrier to the improvement of services in the extent required to motivate change of habits in mobility modes.

3.8 Summary of Improved public transport services for tourists and residents

Within the task 7.4 "Demonstration of improved PT services for tourists and residents" will benefit two key areas.

In Elba, Limassol, Rethymno and Malta, the main partners working for the WP7 measures have got the commitment of local or regional PT companies and operators as well as public administrations to ensure an improvement of routes, timetables and even the quality offered to the customers in terms of technological issues (such as real time information, smart ticketing/payment, bike racks, etc.) to better adapt PT to the demand of residents and visitors.

In Madeira and Las Palmas de Gran Canaria, the PT companies are directly involved in WP7 measures and they have focused on the promotion and communication of urban PT, aiming to get a better image of PT among citizens and tourists (through dedicated sessions for target users, promotional and commercial videos, improvement or acquisition of marketing infrastructures, etc.).

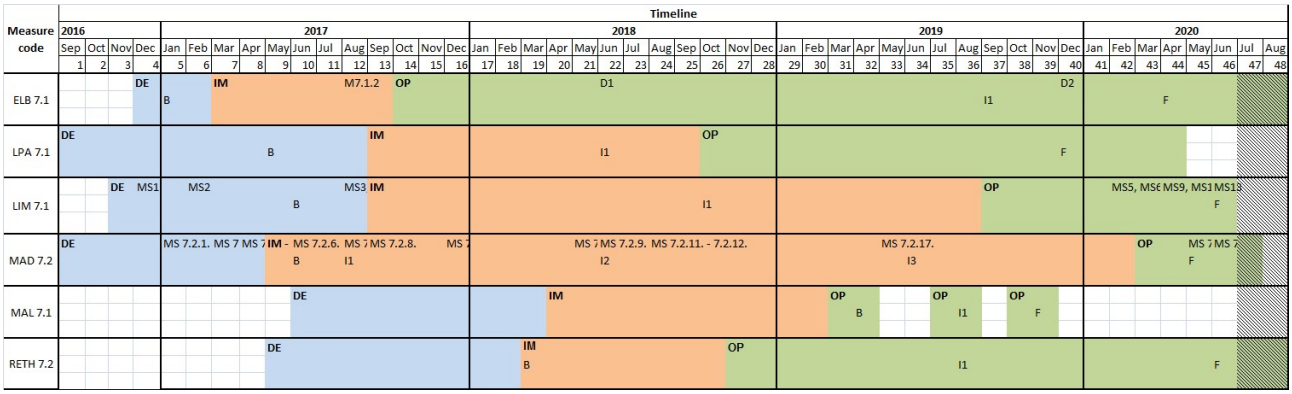

Table 17– Demonstration of improved public transport services for tourists and residents Gantt Chart

3. Demonstration of Electric, Hybrid &LPG Buses &Eco-driving

4.1 Collaboration among DESTINATIONS Sites/partners

	Best Practice requirements: user needs, stakeholder involvement or measure design?	Supplier of BP?	Measures with synergies	Details of planned exchanges between measure leaders
LIM 7.2	- Introducing a sustainable mode for tourists and residents to be able to travel around the old town. Introducing the first hybrid buses in town. BP needs for audio guides	HF, Guaguas and Other sites PT operators	MAD 7.1, RET 7.1, LPA 7.2,	Share criteria about suppliers, maintenance conditions and technical requirements.
LPA 7.2	- Maintenance and repair conditions, evaluation impacts of Hybrid and Electric buses in the PT fleet operation . - Electrical vehicles in Islands with slopes.	HF and Other sites PT operators	MAD 7.1, RET 7.1, LIM 7.2,	Share criteria about suppliers, maintenance conditions and technical requirements.
MAD 7.1	- Electric buses test/running in Europe. - Stakeholders in the scope of electric buses manufacturing involvement in our EV bus pilot test: we already made some contacts with EV bus brands, but we want to compromise them more in our activity. - Hybrid/electric buses purchase practices in other PT companies and evaluation impacts in the PT fleet operation. - Eco-driving monitoring equipment's and evaluation proceedings in other PT companies: HF will install eco-driving monitoring equipment's in 20 buses, and it would be profitable the experience exchange with other PT companies. - Tyres monitoring pressure in PT buses in other PT companies and evaluation proceedings: HF will install tyrepressure monitoring equipment's in 50 buses, and it would be profitable the experience exchange with other PT companies. - Electrical vehicles in Islands with high slopes.	Guaguas and Other sites PT operators	RET 7.1, LIM 7.2, LPA 7.2,	Share criteria about suppliers, maintenance conditions and technical requirements.
MAL 7.1	n/a			
RET 7.1	Efficient assessment studies and users; methods, surveys, questionnaires, tips, lessons learnt (tourists, citizens) - Business models for replication potential (more routes/services/areas, addition of e-buses) - Best practices to promote electro-mobility both in PT and private cars, promotional campaigns, materials, contests etc	Guaguas, HF and Other sites PT operators, META GROUP	MAD 7.1, LIM 7.2, LPA 7.2,	Share criteria about suppliers, maintenance conditions and technical requirements.

Table 22– Best practice and knowledge exchange matrix Task 7.5

There have been identified synergies between measures of Madeira, Las Palmas de Gran Canaria, Limassol and Rethymno regarding experiences and knowledge about hybrid and electric buses, especially when it comes about suppliers, maintenance conditions and technical requirements.

The uptake of these types of ecofriendly technologies (especially electric and hybrid buses) in PT fleets on the islands are not very well developed due to the fact that most of the providers are based on the mainland and potential requirements for services could be very high and time-consuming since any damages will not be repaired locally.

4.2 LIM 7.2 Creation of a hybrid bus hop-on hop-off service in the old town.

4.2.1 Measure Design

4.2.1.1 Detailed Description of Measures to be implemented including city context

For measure LIM 7.2, Limassol will implement a hop-on hop-off bus service offering visitors and residents the chance to follow a route to visit a significant number of museums, archaeological sites and other landmarks in Limassol city centre. The service will be a circular route covering approximately 9km across the city centre of Limassol with a total of 15 stops at tourist attractions where service users will be able to get off the bus, spend time at the places of interest and get on the next bus to continue the tour using the same bus ticket.

Service users will be able to purchase their tickets from hotels and tourist information offices. Tickets fares will be determined according to standard European fares for this type of service as well as the company's operational costs that will be identified at the beginning of implementation.

The two hybrid buses will be of category M3-Class I as defined in the European Directive 2001/85/EC, with twenty five seats and space for standing to allow movement. The buses will be accessible to people with disabilities.

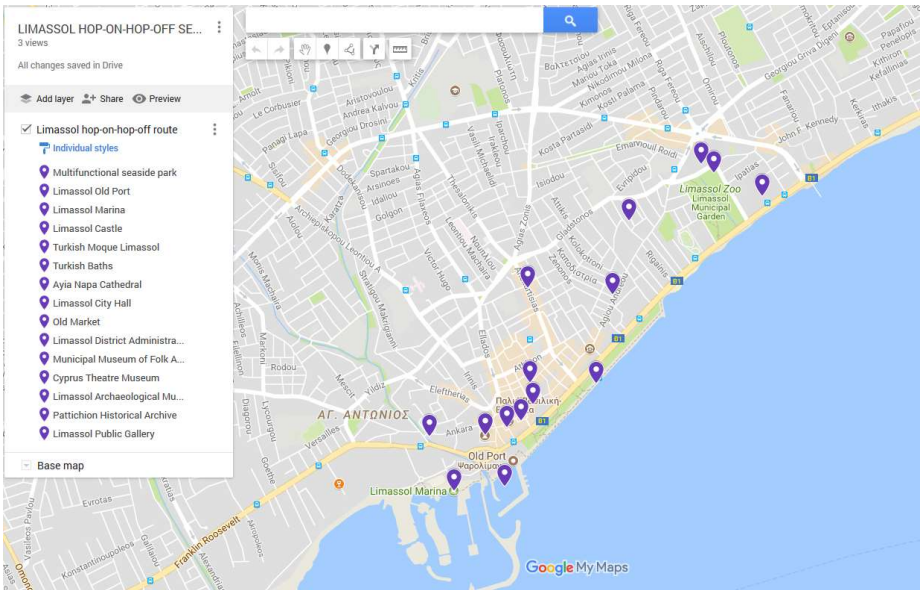

Figure 6 – LIM 7.2 The Limassol hop-on-hop-off service bus route

Audio guides will be available on these buses and will provide a full tour in five languages. Promotion of the service will take place in hotels, tourist information offices, urban buses, airport shuttle service and other points. Integrated services will offer the traveler the opportunity to use other sustainable mobility modes such as PT to get to the hop-on hop-off bus at a single price.

Hotels that are located further away from the Limassol city and old town will be approached to start their own shuttle service in order to transfer their guests to the old town. In addition, hotels will promote this service through flyers, adverts and banners.

To date, the Limassol Tourism Company has held several meetings with the Limassol Bus Company and the Ministry of Communication and Works to design the technical specifications of the hop-on hop-off buses and plan out the route. The tender documents for the purchase of the hop-on hop-off buses have been published for public consultation and comments through the official government procurement portal.

4.2.1.2 Project Partners working on measure, roles and responsibilities

In Limassol, the Limassol Tourism Company is the main project leader for this measure with the Limassol Municipality (partner no. 7) collaborating with the implementation of specific activities.

The Limassol Tourism Company will be responsible for preparing the specifications and procurement procedure for the purchase of buses, audio guides and promotional campaigns.

Limassol Municipality (partner no. 7) will collaborate to monitor the hop-on hop-off service and participate with the pilot testing of the service.

4.2.1.3 ITS Technology, system or service requirements

For the implementation of this measure, Limassol requires the purchase of hybrid buses, audio guides in five different languages and mechanisms for the accessibility of people with disabilities on buses.

The hybrid buses will be low floor, category M3-Class I, with 25 seats (According to the EU guidelines 2001-85/EK). The weight will be determined per EU standards. The dimensions will be 9m length, 2,5mwide and 3m height.

The minimum power output of the diesel engine (power and torque) must be:

- Low power: 138kW (12,5kW/tone of GVW) and high torque: 715Nm (65Nm/tone of GVW)

Hybrid drive system includes an integrated power train control system as well as and an electric motor of the same or better power and torque of the diesel engine.

The audio guides on buses will consist of a central content management software system (web based) with which the administrator will have total control and will be able to inform and to administrate the multimedia data that will transfer to users. Flat screens (24'') will be installed in front of every passenger seat providing information for specific landmarks as "Point of Interest"(POI) and the capability of personalised translation (handheld device). The available data will be added in the POI through the central content manager software administrator. Furthermore, passengers will be able to use handheld devices and will have the option to choose between five languages.

4.2.1.4 Procurement of services

Limassol has already published the tender documents for comments in the national gazette and will proceed with the procurement process for the purchase of the two hybrid buses.

A separate call for tender will be announced regarding the audio guides.

4.2.2 Measure ex-ante evaluation

For this measure, baseline data will be collected mainly by estimations and through data collection. Limassol has identified the following impact indicators that will allow the evaluation of the measure's implementation.

1. Economy: The ''Average operating revenue'' and ''Average operating costs'' has not yet been estimated for the ex-ante. Limassol needs to forecast the operating revenue and cost for the hop-on-hop-off service. Regarding the ''Investment Costs', the expected investment cost is €382,000 for the purchase of the hop-on-hop-off bus service. There is no baseline for these impact indicators, since this is a new measure for Limassol, no previous investment was made.

2. Transport: Traffic flow'' (peak/off-peak) data is not available, therefore there is no baseline for this impact indicators under this measure.

3. Environment and Energy: The identified impact indicators under the category of the Environment are the estimation of CO_2 emissions and vehicle fuel efficiency. There is currently no baseline or ex-ante data available for this measure.

4. Society: ''Perception of accessibility level of transport vehicle'', this impact indicator will be measured by the index of ''accessibility perception'' on a 5-point scale. There is no baseline available, since the hop-on hop-off bus is a new measure for Limassol. It is expected that service users will rate the level of accessibility 4 on the scale of 5.

4.2.3 Implementation Plan

1. Specifications of buses in cooperation with the Department of Road Transport (September 2016-December 2016). Limassol, in collaboration with the Department of Road and Transport, has determined the specifications of the hybrid hop-on hop-off buses.
2. Preparation of procurement documents and initiation of purchase process for buses (December 2016- February 2017).During this period, Limassol has prepared the tender documents and initiated the procurement process.
3. Bus tour plan in cooperation with Limassol Municipality, Limassol bus company and tourist guides association(February 2017- May 2017). In collaboration with Limassol Municipality and the Limassol Bus Company, a tour plan for the hop-on hop-off service has been identified.
4. Specifications and procedure for the purchase of audio guides (February 2017- May 2017). The specifications for the audio guides for the hop-on service have been determined.
5. Purchase and importing of buses (December2017- January2018).
6. Purchase of audio guides and installation (December 2017- January 2018).
7. Preparation of audio tour and translation in five languages (December 2017- January 2018).
8. Pilot test (January 2018).

4.2.3.1 Risks and constraints

The procurement process for the purchase of the hop-on hop-off buses has initiated with the publication of tender documents in National Gazette. The procurement process hasn't completed

yet due to institutional barriers that delayed the procedure of publication. In the case of the audio guides LTC is in the process of selecting suppliers which it has proven to be a challenge since there are limited numbers of companies in Europe.

4.3 LPA 7.2 Hybrid buses in the urban bus fleet.

4.3.1 Measure Design

4.3.1.1 Detailed Description of Measures to be implemented including city context

Guaguas Municipales, the urban PT company of Las Palmas de Gran Canaria has a fleet of 242 buses with an average age of 10 years. From those buses, 241 are diesel units and just only one is a hybrid bus.

In order to reduce CO_2 emissions, fuel consumption and improve the general air quality levels and contribute towards the reduction of congestion, Guaguas Municipales will acquire within Civitas DESTINATIONSproject three hybrid buses for the urban PT services to replace the oldest diesel vehicles.

The measure will include the following actions:

- Definition of specifications and preparation of tender documentation andmarket analysis for hybrid buses, choosing the appropriate vehicles for each case (orography, number of passengers, type of service, etc);
- Identification of the oldest diesel units to be replaced;
- Selection of routes;
- Purchasing of 3 hybrid buses;and
- Testing and demonstration of the new vehicles in normal operation.

4.3.1.2 Project Partners working on measure, roles and responsibilities

The main partner of Civitas DESTINATIONS working in this measure is Guaguas Municipales as the company in charge of the urban PT services in Las Palmas de Gran Canaria.

4.3.1.3 ITS Technology, system or service requirements

After analyzing the current fleet, the routes, the number of passenger and the investment proposals, the requirements for the hybrid buses were defined.

According to the main features of the next hybrid buses to be added to Guaguas Municipales fleet, they need to comply with the requirements collected in the tender documentation launched on 26/05/2017 in the Official Journal of the European Union.

The most important features are listed below:

- Accessibility:
  Buses must be considered low platform (i.e.low floor throughout the entire useful surface of the vehicle) with 3 doors and a ramp for access of people with reduced mobility.
- Dimensions:
  Length: 12 m;
  Width: 2.5 -2.55 m; and
  Height: 3.5 m (including hybrid batteries and air conditioner equipment).

- Engine:

The engine must comply with the maximum emission limits according to EURO regulations in force at the time of delivery of the vehicles.

The electric motor that provides the motricity to the wheels must have at least 147KW and a minimum torque of 2.000 Nm and will be series hybrid technology.

The buses must have a management engine system of maximum reliability and that allows a quick simple, effective and centralised diagnosis with the rest of the management devices that equip the bus. The power of the combustion engine will be higher than 240 CV / 176KW with an average torque of 1.000 Nm (measures in accordance with Directives 80/1269/EEC). The vehicles may be used on highways, requiring continuous speeds up to 80 Km/h.

In the case of emissions, vehicles must comply with Directives 88/77/EEC, 91/542/EEC and 72/306 EEC in the latest version 97/20/EEC or the regulations in force at the time of delivery of the units.

4.3.1.4 Procurement of services

A tender process has been launched on 26/05/2017 in the Official Journal of the European Union for the acquisition of three hybrid buses for the urban PT fleet of Guaguas Municipales.

4.3.2 Measure ex-ante evaluation

For this measure, baseline data will be collected by measurements, estimations and carrying out surveys. Las Palmas de Gran Canaria has identified the following impact indicators that will allow the evaluation of the measure's implementation under the Environment, Society and Energy categories.

Impact category	Impact indicator	Unit of measure	Baseline	Ex-Ante
Environment	CO_2 emissions	CO_2 toe	139,621 ton of CO_2/year for private cars 2,868 ton of CO_2/year for PT vehicles (buses)	130,877 ton of CO_2/year for private cars 2,535 ton of CO_2/year for PT vehicles (buses)
Environment	Noise	Index of people troubled by noise (Likert scale)		
Society	Awareness	Index of "awareness" about the new hybrid buses (Likert scale)		Increase of citizens' awareness on the new hybrid buses
Society	Satisfaction	Index of "satisfaction" (Likert scale)		Increase of citizens' satisfaction about the quality of the mobility system (transport infrastructure and service by mode)
Energy	Vehicle fuel efficiency	Toe	54,757 toe (tonne of oil equivalent) for private cars 11,975 toe (tonne of oil equivalent) for PT	51,328 toe (tonne of oil equivalent) for private cars 10,586 toe (tonne of oil equivalent) for PT

			vehicles (buses)	vehicles (buses)

Table 23– LPA 7.2 ex-ante evaluation

4.3.3 Implementation Plan

This measure has different stages, some of them depends on the tender process.

- Hybrid buses market study and hybrid buses specifications definition (Nov 2016 – Apr 2017)
- Tender Process (May 2017 – Jul 2017)

  The tender process was launched on 26/05/2017 in the Official Journal of the European Union for the acquisition of three hybrid buses for the urban PT fleet of Guaguas Municipales.

  The deadline for submitting applications ended on the 11th of July of 2017.
- Delivery of buses is expected in May 2018.

After the process for awarding the contract, the supplier will have an execution time for the supply of the three vehicles of 9 months.

4.3.3.1 Risks and constraints

The main risks of this measure in Las Palmas de Gran Canaria come from the lack of knowledge and experiences of maintenance and repair staff of the companies that usually work for buses or heavy truck companies of the island. Hybrid or electric buses are not typical for Gran Canaria.

4.4 MAD 7.1 Electrical vehicles and clean fuels for public transport at urban and interurban fleet.

4.4.1 Measure Design

4.4.1.1 Detailed Description of Measures to be implemented including city context

The use of alternative energy sources to fossil fuels and promotion of electric/hybrid tourist buses, improves environmental quality by reducing pollutant emissions and noise, as well as the image of the Madeira Island of one that strongly relates to eco-tourism and respect of natural heritage. Considering the public and private bus fleet related to tourism in Madeira, this action has a huge potential impact to reduce fossil fuel consumption on the island and decrease energy dependency. On another hand, eco-driving habits and techniques improve travel experience and contribute toward generating positive touristic experiences.

The preparation phase of the measure allowed partners to clearly identify the main problems, focusing on less energy intensive solutions and related drawbacks. Currently the technological solutions offer little credibility to users and local authorities, considering the high slopes that comprise Madeira roads. Moreover, there is a high initial cost for an electric bus compared with conventional solutions and a low offer by the market of electric buses compared with the light vehicles; limited autonomy of batteries; and low eco-driving habits. On the other side, there is a

strong feeling or urgency in renewing PT fleets, as operators currently use fairly old buses, therefore contributing to a high level of pollutant emissions and noise during peak hours and a high fossil fuel dependency in that sector.

Considering this framework, the measure will expand the charging network for electric vehicles; develop an information system about the charging network; develop incentive schemes to promote the purchase of electric vehicles; deploy new forward-looking regulations and study electric transports impacts in electric production and use of renewable energy.

The main outputs of this measure are listed below:

- 5 mini/midi electric or hybrid buses (co-financed by external funds);
- 1 feasibility study of electrical/hybrid vehicles in Madeira;
- 20 buses equipped with eco-driving system;
- 50 drivers involved in monitoring system and incentive scheme;
- 6 training sessions and at least 200 drivers enrolled and trained;
- 50 buses equipped with tyre-pressure monitoring system;
- 1 bus equipped with PV system; and
- 1 business case study for PV system.

4.4.1.2 Project Partners working on measure, roles and responsibilities

Partner short name	Activities description
AREAM	Responsible for the preparation, implementation, evaluation and dissemination of: urban electric pilot test; PV system development and pilot test. Also responsible for the evaluation of electric/hybrid performance. Will contribute to: electric/hybrid bus acquirement; eco-driving program; tyre pressure monitoring system.
HF	Responsible for the preparation, implementation, evaluation and dissemination of: conducting the pilot test of PV system in buses; electric/hybrid bus acquire; eco-driving program; tyre pressure monitoring system. Will contribute to: urban electric pilot test.
CMF	Contribution to urban electric pilot test.
SRETC	Contribution to urban electric pilot test.
ISSINOVA and TEMA	To provide support in developing business case for PV system (via T8.2).

Table 24– MAD 7.1 Project Partners working on measure, roles and responsibilities

4.4.1.3 ITS Technology, system or service requirements

HF will purchase equipment (a tyre pressure system and an eco-driving module) and hybrid buses (technical work related with the user needs was performed under DESTINATIONS but the purchase of the buses is expected to receive funding from the regional structural funds), whilst AREAM will test a solar panel on the top of an interurban bus, in order to power the air conditioner. Below explains more in detail the technical characteristics of the ITS systems sought after.

Eco-driving system

This equipment will be used for real time monitoring and feedback of driving /vehicle information, and will be used as support for the training actions provided to the drivers every six months, in order to take full advantage of the potential of the equipment. These training courses are carried out by the internal resources of Horários do Funchal.

The equipment to be considered must comply with the following requirements, and the characteristics may be adjusted according to the type of vehicle to receive the equipment, namely the existence of CANbus and Fleet Management System communication:

Technical requirements of the equipment:

- Receive readings from the engine management system and the motion sensors that are integrated into the bus, converting this information to a built-in system in the driver's aid panel that allows real-time monitoring and feedback of driving behaviours (Safety and passenger comfort and driver behaviour in driving);
- Obtain the location of drivers, via GPS;
- Integrate login by driver; and
- Production of various types of indicators and reports in real time on a daily, weekly, monthly and annual basis, allowing fleet managers to consult and configure the reports produced, to monitor and evaluate driver behaviour and identify training needs in the Eco-driving module.

Website reporting parameter definitions:

Displayed on the website is a selection of driver reports shown in two categories: Safety (covering speed parameters) and comfort and efficiency (covering engine revs, fuel and idling parameters).

- Litre/100 km (L/100 km)
- Fuel Litres (Litres)
- Sweet Spot (% of Trip Distance)
- Over-Rev (% of Trip Distance)
- Idle Time (% of Engine Time)

The use of this system allows:

- Reduction of fuel consumption and CO_2 emissions;
- Fewer accidents and other incidents;
- Less maintenance costs;
- Increased customer satisfaction through increased safety and comfort; and
- Increased involvement of drivers in company results.

Tyre pressure monitoring system

The installation of tyre pressure monitoring systems in 50 urban buses, covering approximately 33% of the fleet, is foreseen. This will allow buses to always circulate with an indicated pressure, resulting in reduced tyre wear and consequently, an increase in durability. According to European Commission communication IP / 08/786, tyres with insufficient pressure can lead to a 4% increase in fuel consumption and a 45% reduction in tyre life. Also, a 3 to6% loss in tyre pressure may occur monthly, without the driver realising it, mainly in heavy vehicle tyres.

The use of the correct pressure will reduce fleet maintenance costs, particularly with tyres and the repair of premature wear of the steering system, improve energy efficiency and vehicle safety.

Technical requirements of the equipment:

This solution uses capsules, which are installed on the inside of the tyres by certified technicians, allowing the constant monitoring of tyre pressure, this then allows the reading to be performed by a central system, to be installed in the refuelling and washing zone. This system performs the reading of the tyre pressure capsules, issuing an alert to the technician who performed this task in the case of incorrect pressures. This system does not represent any communication costs, nor the need to install antennas in buses or other components that often make the system expensive.

Tyre Sensor requirements:

- Built-in battery with radio frequency transmitter;
- One sensor per tyre with unique identification;
- Placed on the butyl layer of the tyre; and
- Estimated lifetime of 6 years.

Tyre pressure sensors reading station to be installed in the fuel supply station of buses:

- 20 meter range;
- Automatic verification within the area range; and
- Provide daily information to the maintenance manager.

Web Platform:

- Vehicle summary;
- Last reading for each tyre;
- History of readings;
- Notification messages;
- Recommended pressure;
- Pressure detected;
- Temperature detected; and
- Pressure compensated.

Advantages of installing the equipment:

- Reduction of assistance on roads related to tyres, which often have a gradual loss of pressure without the driver having the perception;
- Improved bus control and stability, resulting in improved passenger comfort and safety;
- Increased lifetime and reduced tyre wear due to constant pressure monitoring; and
- Reduction of the number of tyre bursting, applicable only in cases of bursting due to incorrect pressures.

Mini/midi electric or hybrid buses

According to market research conducted during the project planning phase, standard bus suppliers do not have proven Plug-in solutions. However, it is in the interest of suppliers to adapt the offer to the demand, within the technical possibilities, by installing batteries with a capacity of 30 to 50 km in electric mode, and the possibility of being charged at a charging point.

The installation of batteries with appropriate capacity and the use of regeneration systems with adequate power to the marked/particular orography of the Municipality of Funchal, allows the storage of all energy that is recovered through braking.

The following minimum technical characteristics are presented:

- Euro VI
- Engine Cylinder – [2.500; 3.000] cm3;
- Operate in routes with elevations up to 25%.

The procurement for the acquisition of five plug-in hybrid buses is currently taking place; however, there have been no responses to the procedure. The solution will go through the launch of a new procurement for the acquisition of electric buses, mini or midi, to carry out the low pollutant emission service in the urban centre of Funchal and tourist zone of “Monumental”, called Eco line and Green line. These vehicles should be able to circulate in complete electric mode, with zero local emissions and low noise, similar to what was done by the Gulliver electric minibuses.

Example of minimum technical characteristics to be submitted in the next procurement:

- Electric engines with more than 150 KW;
- Battery capacity of more than 70 kWh, with an autonomy for over 150 km range;
- Nominal torque of more than 1500 N;
- 50 kW minimum charging device power; and

- Operate on routes with elevations higher than 17%.

PV system

The installation of PV systems for the production and supply of electric energy to the air conditioning system and to the auxiliary electrical systems of heavy passenger vehicles, will contribute to a significant reduction in the consumption of fossil fuel (diesel), as well as the reduction of pollutant emissions, as a result of reduced idle time, less effort of the air conditioning compressor and the alternator to supply power to the auxiliary electrical equipment (interior lights, sound system, media (television, DVD), USB chargers, wireless, others).

Additionally, it will contribute to the integration of a complementary system that allows the production of supplementary energy, aiming for the energy to be stored in batteries, thus allowing the solar photovoltaic system and other complementary system to function in an integrated way.

Technical requirements:

- Use of certified photovoltaic solar panels with a minimum power of 1 KW;
- Integration with the air conditioning fluid circuit used by the installed original compressor;
- Existence of appropriate hardware and software for the management of the energy flows produced;
- Batteries with a minimum storage capacity of 4 kWh, suitable for PV power generation;
- Minimum annual production of 1 460 kWh (considering that for the minimum installed power (1 kW), it will produce energy for 365 days for an average of 4 hours / day). The average annual solar radiation of Funchal can be used;
- Display that shows the total energy produced by the PV and the energy capacity stored in the batteries;
- To present selector that allows to select the type of system to be used in the system of air conditioning (if electric compressor will use electric energy produced, if reference compressor will consume fossil fuel), allowing this selection to be carried out automatically by the management system of energy; and
- The PV equipment to be integrated in the vehicle should not need significant changes in the climate control system and in the power supply to the auxiliary electrical systems of the vehicle, presenting the ability to be adapted to other models of air conditioning systems.

During the preparation of the requirements and as a result of the recommendations from the PT operator (Horários do Funchal), it was assumed that the production of energy through the equipment to be installed would be quite low for the energy needs of the bus. This would be limited by the roof area available for the installation of the panels and batteries, as well as the absence of electric compressors on the market that could be integrated with the PV system, thereby forcing the system to only supply power to the evaporation unit (min 9A, max 38A, 24v) and condensation (min 11A, max 30A, 24v) of the air conditioner. Further investigation is due to be performed to understand the feasibility of the PV solution.

4.4.1.4 Procurement of services

Horários do Funchal is in the process of launching a tender to purchase a system to optimize the pressure and temperature of tyres. This action will help to increase the lifetime of the tyres, increasing safety at the same time as maintenance costs sharply decrease. The PT operator has already launched a tender to purchase 20 eco driving systems which will allow the company to keep track of the main driving performances, to track them and activate contingency measures that can help to decrease accidents, fuel consumption whilst contributing to a smooth driving experience among the passengers. Horários do Funchal has launched an international tender process to purchase 5 mini hybrid plug-in buses. AREAM, on the other hand, will carry out subcontracting (35,000€) to bring a regular size electric bus to perform some tests in several routes along the islands of Madeira and Porto Santo.

4.4.2 Measure ex-ante evaluation

Impact category	Impact indicator	Unit of measure	Baseline	Ex-Ante	Target Group
Energy	Energy mix in PT fleet *(CIVITAS Core Indicator number 4)*	MWh; %	Yes. Data collected until August 2017	new target	PT operators
Energy	Use of RES in PT fleet	MWh	Yes. Data collected until August 2017	77 MWh	PT operators
Energy	Energy consumption *(CIVITAS Core Indicator number 3)*	MWh; kWh/km; kWh/PKT	Yes. Data collected until August 2017	Less 348 MWh	PT operators
Environment	CO2 emissions avoided by EV *(CIVITAS Core Indicator number 11)*	t; g/vkm	No	Less 105 t CO2	PT operators
Environment	CO emissions avoided by EV (CIVITAS Core Indicator number 12)	kg	No	new target	EV users
Environment	NOx emissions avoided by EV (CIVITAS Core Indicator number 13)	kg	No	new target	EV users
Environment	PM emissions avoided by EV (CIVITAS Core Indicator number 14)	kg	No	new target	EV users
Economy	Investment costs *(CIVITAS Core Indicator number 2A)*	Eur	No	new target	PT operators
Economy	Operation costs (CIVITAS Core Indicator number 2B)	Eur/km	Yes. Data collected until August 2017	new target	PT operators
Transport	Perception of quality of service (CIVITAS Core Indicator number 36)	qualitative	Yes. Data collected until August 2017	new target	PT passengers
Transport	Striking driving situations *(city specific indicator)*	number	Yes. Data collected until August 2017	new target	Bus drivers

Table 25– MAD 7.1 ex-ante evaluation

4.4.3 Implementation Plan

In Mad 7.1. AREAM, together with HF, has nearly fulfilled all the design and specification phases, paving the way to further implementation work:

Mil.	Milestone /activity description	Concluded ?	Month	Current situation
	Design and specifications		*1-12*	
7.1.1.	Design, stakeholders involvement and preparation of urban electric bus pilot test in Madeira Region	N	1-12	• Pilot test of E-city bus, from CaetanoBus-Siemens partnership was postponed and is currently scheduled for September/October 2017.New contacts were made with other electric bus manufacturers for future tests: BYD, Irizar, Solaris, VDL and Volvo. GV21 is trying to facilitate the communication flow with the Chinese

				brand BYD.
7.1.2.	Feasibility study of electric and hybrid buses in Madeira	N	4-12	HF has not yet performed this task
7.1.3.	Design and involvement of stakeholders and preparation of eco-driving incentive program. Design & specifications for eco drive system acquisition.	Y	4-12	• Procurement for the acquisition of energy efficient safe driving support systems. HF has drafted the requirement analysis and the call for tender is due to be launched shortly.
7.1.4.	Design and specifications for the acquisition of tyrepressure monitoring systems.	Y	4-12	• Procurement for the acquisition of tyre pressure control systems to be installed in 50 buses –currently taking place.
7.1.5.	Definition of the baseline indicators	Y	2-12	AREAM has provided contributions to the draft evaluation plan (D9.1.).
7.1.6.	Design, player's involvement and specifications of PV system. Business case design.	N	2-12	• Estimation of energy consumption needs associated to air-conditioning. Definition of the requirements of the procurement for the acquisition/ development of PV kit to help running tourism buses.
	Demonstration		*6-42*	HF has launched an international procurement process to purchase five mini plug-in hybrid buses. This tender is currently taking place

Table26– MAD 7.1 Implementation Plan

4.4.3.1 Risks and constraints

	Potential Drivers	**Potential Barriers**	**Activities to be taken to mitigate the barriers**	**Risk assessment (low, moderate, high)**
MAD 7.1.	Political/strategy	Political/strategy	Political engagement	low
	Institutional	Institutional	Institutional engagement	low
	Cultural	Cultural	Awareness raising campaigns, EV bus pilot test	moderate
	Financial	Financial	Other regional funds	high
	Technological	Technological	EV and hybrid bus manufactures involvement	high

Table 27– MAD 7.1 Risks and constraints

4.5 RET 7.1 Introducing electric vehicles for PT.

4.5.1 Measure Design

4.5.1.1 Detailed Description of Measures to be implemented including city context

Currently there are no electric buses in the whole region and most citizens are unfamiliar with electromobility and the benefits of the technology. The demonstration of EV in the municipal fleet aims to unlock the potential of the EV market in the region and promote the uptake of clean vehicles. Rethymno will lead as an example and promote replication for other Greek cities.

The scope of the measure is to introduce clean vehicles in the municipal and PT fleet, through the design and launch of new routes of high interest connecting points of interest around the city for visitors and citizens aiming to improve mobility services, to reduce private and rental car circulation and to challenge the replacement of old vehicles with clean ones. The use of cleaner, alternative fuels and the uptake of electromobility will improve the urban environment by reducing pollutant emissions and noise and the image of the city as a sustainable destination.

Expected outputs

- 1 electrical mini bus rented and one electrical car to be used for the works of the Municipal Technical Services;
- Seasonal route introduced serving the city beach line (pilot tested for one season);
- Attractive signage to properly promote the electromobility and promotional campaign; and
- Assessment report &Business model evaluation to keep the new routes self-sustained. Evaluation of replication potential in more routes/services/areas.

By demonstrating to tourists and the tour operators that Rethymno is investing in low emission transportation sends out a positive message about the environmental values of the city. The new routes will be designed especially for tourists who want to see the city centre and have convenient access to the long beach and parking places, such that they do not need to take private transport (taxi, rent car). Clear messages will promote the use of e-vehicles in general along with the enhanced touristic profile of the area as a sustainable destination.

This measure is innovative for the whole region since Rethymno will launch the first e-vehicles and introduce to the citizens the benefits of electromobility. The electric mini bus operated will be also accessible to people with disabilities for an inclusive mobility. The demonstration of the electric vehicles aims to have a multiplier effect on similar tourist services and cities in Europe. It could be a good practice example for other Greek cities and could be replicated to inspire other municipalities.

The specific goals of the measure are:

- Launch clean vehicles to the municipal fleet;
- Reduce car use, congestion and parking problems;
- Change habits of locals and visitors – Promote sustainable mobility modes; and
- Test a new route along city beach road which can lead to a significant reduction of private cars/taxi circulation

4.5.1.2 Project Partners working on measure, roles and responsibilities

In the table below the involved project partners and their role and responsibilities are described.

Project Partner	Role	Responsibilities
Rethymno Municipality	Measure Leader – Beneficiary	Measure implementation, procurement process, operation of the new routes during the testing period
Technical University of Crete	Measure support	Support to market research for vehicles Support to business plan for the uptake of routes by PT operator. Replicability potential for increase the e-vehicles in municipal fleet. Design and placement of training and promotional materials. Cooperation with the Hellenic Institute for Electric Cars

Table 28– RET 7.1 Project Partners working on measure, roles and responsibilities

4.5.1.3 ITS Technology, system or service requirements

The measure does not include the application of IT systems/tool.

4.5.1.4 Procurement of services

The measure includes the rental of one electric mini bus to operate a pilot route that connects the main parking stations of the municipality and the beach.

The procurement of service is also foreseen for decoration panel of the electric mini bus, signage of e-bus stops and promotional materials.

For the procurement of equipment, the depreciation of 1 electric car to be used from the technical department of Rethymno Municipality is foreseen; a call for tender will be applied.

4.5.2 Measure ex-ante evaluation

The evaluation of the measure includes environmental, social, and economy impact indicators. The data collection for the measure's evaluation is planned in August 2017, August 2018 and August 2019, before, during and after the measure's implementation correspondingly.
The selected indicators are presented below.

The impact on energy will be measured through:

- **Vehicle fuel efficiency**as the energy consumption for the municipal and PT activity and the comparison of vehicle fuel efficiency after the introduction of electric vehicles.

The impact on society will be measured through:

- the **level of acceptance**, in terms of the percentage of citizens and tourists that are in favor of electromobility and the adoption of electric vehicles in the municipal fleet. The level of acceptance after the measure implementation is expected to be 20%.
- **the level of awareness**, in terms of the percentage of citizens and tourists that are aware of the introduction of the electric vehicles. The level of awareness after the measure implementation is expected to be 60%.

The impact on society will be measured through:

- **The PT service per head of population,** as the number of departures per day from all PT stops divided by the total population of the city. The baseline of the indicator will be obtained in August 2017. The number of departures of the PT service is expected to increase by 5%, after the measure.

The economic impact will be measured through

- The **capital costs** and the **average operating costs** of the electric vehicles in order to present the economic impact for the PT operator and the municipality, that could be used in a future business plan.The economic indicators will be defined at the end of the implementation of the measure.

4.5.3 Implementation Plan

The description of measure's milestones and the dates are presented below.

M1. Definition of specification of vehicles and Market survey (March 2017);
M2. Procurement of the bus by the PT operator process (October 2017);
M3. Design the new route, consultation with tourism and PT stakeholders (January2018);
M4. New signage, promotional material to promote the new route and electromobility (May 2018);
M5. Pilot operation of the beach linear line (June 2018);
M6. Users' satisfaction survey and evaluation of the new route (August 2018);
M7. Pilot operation of the University line (October 2018); and
M8. Evaluation of a business model and the potential of replication (February 2019).

The engagement of the PT operator is the key for the measure. Through the established collaboration the PT operator has agreed to include an electric mini bus in their fleet and to support the measure's scope.

It is crucial for the success of the measure to ensure that the new routes will continue to operate after the pilot period and have a long term impact in the area, leading to the uptake of electromobility. A business plan will be developed for the PT operator to undertake the operation, improvement and maintenance of the route and vehicles.

An effective and strong promotional campaign is a key factor in order to achieve the awareness and acceptance of the citizens towards electric vehicles and the introduction of e-buses in the PT fleet. Development of attractive signage and material will require the contribution of experts and support of experienced partners.

4.5.3.1 Risks and constraints

The main risk for the success of the measure is the possible issues in the maintenance of the e-mini bus, due to the fact that the provider will be based in the mainland and potential requirements for services could be very high and time-consuming since any damages will not be repaired locally.

The economic viability of the mini buses route could be a barrier if it is not proved self-sustaining after the period of pilot operation.

4.6 Summary ofelectric, hybrid and LPG buses (and eco-driving)

Within the task 7.5 "Demonstration of electric, hybrid and LPG buses (and eco-driving)" among the sites different solutions have been taken into consideration.

On the one hand, Las Palmas de Gran Canaria, Limassol and Madeira are going to purchase hybrid buses. However, some differences arise between these three sites. Whilst Madeira and Las Palmas de Gran Canaria will acquire hybrid buses for its urban PT fleet, Limassol will set up a hop-on hop-off service for touristic purposes in the city centre. Furthermore, Madeira will acquire and study other systems that will allow their buses to save energy (such as tyre-pressure monitoring system and PV system)

On the other hand, Rethymno will test an electric bus to operate a pilot route that connects the main parking stations of the municipality and the beach whilst Malta will retrofit one minibus to use LPG, or dual fuel technology, for testing the operation of a PT route to connect the ferry landing site to the Park+Ride Facility outside Valletta.

Moreover, in Funchal 20 buses will be equipped with an eco-driving system and at least 200 drivers will be trained in 6 different training sessions.

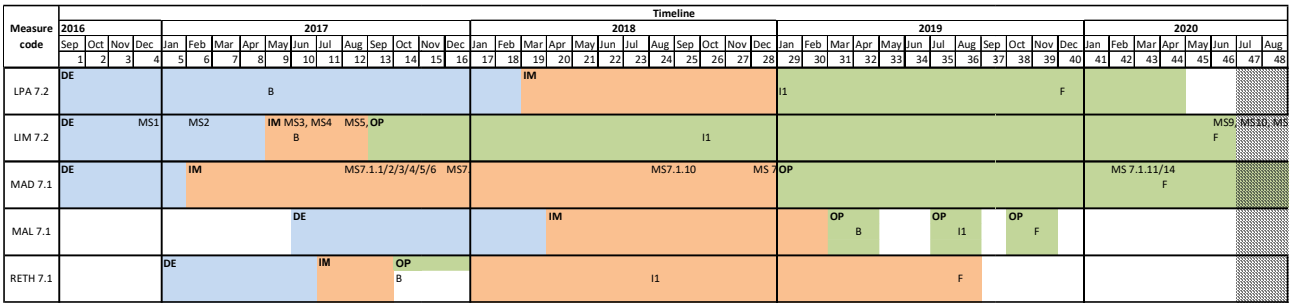

Table 29– Demonstration of electric, hybrid and LPG buses (and eco-driving)Gantt Chart

4. Demonstration of Integrated Mobility and Tourism Information &Payment Services

5.1 Collaboration among DESTINATIONS Sites/partners

Best practice and knowledge exchange matrix

	Best Practice requirements: user needs, stakeholder involvement or measure design?	Supplier of BP?	Measures with synergies	Details of planned exchanges between measure leaders
ELB 7.2	n/a have already designed		LPA 7.4, MAD 7.4	Exchange ideas and experiencies about payment technology and possibilities.
ELB 7.3	n/a have already designed (CELSO project)	Memex	MAD 7.3, LIM 7.3 & 7.4, LPA 7.3	Exchange of ideas, design and preparation work and App funcionalities
LIM 7.3			MAD 7.3, LPA 7.3, ELB 7.3	Exchange of ideas, design and preparation work and App funcionalities
LIM 7.4	BP for mobile application - good examples (MAD or MEMEX- TreviMove)	HF, Guaguas, Memex	MAD 7.3, LPA 7.3, ELB 7.3	Exchange of ideas, design and preparation work and App funcionalities
LPA 7.3	n/a have already designed		MAD 7.3, LIM 7.3 & 7.4, ELB 7.3	Exchange of ideas, design and preparation work and App funcionalities
LPA 7.4	LPA desire BP ideas on urban PT touristic cards	HF	ELB 7.2, MAD 7.4	Exchange ideas and experiencies about payment technology and possibilities.
MAD 7.3	- Rules to define the bus stop code (question launched in Google groups) - Methodologies to optimize the PT network and service operation. - Powerqubit electronic panels and AVL system for PT	HF, Guaguas, Memex	LIM 7.3 & 7.4, LPA 7.3, ELB 7.3	Exchange of ideas, design and preparation work and App funcionalities
MAD 7.4	- Metro Tenerife and QR code tickets		ELB 7.2, LPA 7.4	Exchange ideas and experiencies about payment technology and possibilities.

Table30– Best practice and knowledge exchange matrix Task 7.6

There have been identified synergies between measures of Madeira, Las Palmas de Gran Canaria, Limassol and Elba regarding to experiences and knowledge about App functionalities, payment equipment and real time information systems.

Guaguas Municipales has found some best practice documents provided by Horários do Funchal very useful when it is time to develop new kinds of tickets focused on the tourism market of Las Palmas de Gran Canaria.

5.2 ELB 7.2Integrated payment

5.2.1 Measure Design

5.2.1.1 Detailed Description of Measures to be implemented including city context

The purpose of this measure is to analyse the possibility of making an integrated payment of the PT service and other services (e.g. car parks) to the island of Elba. Should it not be possible to realise this integrated payment system, the alternative could be to make bus ticket payments by SMS. This option is very useful as the bus ticket is not easy to find at local stores due to low margins and the need to pay tickets for sale in advance.

The design activities developed for this measure are:

- Analysis of the existing tariff policy, indications provided at regional level with the new transport plan and the results of PT service procurement at regional level;
- Definition of specific tariff for complying the tourist needs and requirements of mobility services to be integrated;
- Analysis of the integrated payment system operated by the PT company in other basins to the specific ELBA situation identifying the main pillars and constraints for the possible extension to the Elba;
- Verifying the possibility to implement this extension with the PT company and identification for the main organisation/operation and clearing aspects;
- Identification of some alternative/complimentary solutions for buying the ticket via SMS and/or with a specific smart phone app for two or three tariff typology; and
- Delivery of the technical feasibility study for integrated payment solutions for Elba Island.

Figure 7 – ELB 7.2Advertise of ticket payment via SMS

All these activities are part of the agreement between the Portoferraio and Rio municipalities and the PT service provider (CTT Nord).
In particular, due to the impossibility of completing the integrated payment for technical problems, it was decided to proceed with the payment of SMS payment that will be made operational by summer 2017.

5.2.1.2 Project Partners working on measure, roles and responsibilities

Rio Municipality is responsible for this measure with the support of Portoferraio Municipality and of MemEx. MemEx and CTT Nord assessed the possibility of projecting an integrated payment (eg. bus + parking). However, the technical and economic problems were considered too great compared to the possible benefits of the solution.

The agreement to realize a SMS payment was coordinated by MemEx and agreed between CTT Nord and Rio Marina/Portoferraio. SMS was implemented started in May 2017.

5.2.1.3 ITS Technology, system or service requirements

The payment of the bus ticket via SMS is based on a web platform (Ericson), which is an active part in the collection from the telephone companies of the amounts involved in bus ticket payments. These amounts are then delivered to PT companies, with the exception of sales commission.

5.2.1.4 Procurement of services

The implementation of the bus ticket payment function via SMS was in the agreement between Portoferraio and Rio Marina municipalities and CTT Nord (Elba PT services operators). The financial offices of these municipalities have drawn up the assignment contracts that have been approved by the related town councils.

5.2.2 Measure ex-ante evaluation

The ex-ante evaluation of ELB 7.2 was listed in the category of impacts towards the Society and analysed on the basis of the citizens' satisfaction level impact indicator. The possibility to provide an SMS-based ticket will be greatly appreciated by users. For this indicator the ex-ante estimation is 60 % of full user satisfaction versus the 30% of the baseline.

5.2.3 Implementation Plan

The first step of the implementation plan was the agreement between the Elba municipalities and CTT Nord to assess the possibility of creating an integrated payment. After having noticed the great difficulty in realizing this system, CTT Nord has proceeded to design the SMS payment for transport between 10km to 20km.

The SMS payment/ticketing for these distances was launched in May 2017 and has been in operation since June 2017 (M10).The design for the possibility of paying for other distances (e.g. 30 and 40km) using SMS is ongoing and will be completed by September 2017.

5.2.3.1 Risks and constraints

There is no risk for this measure because the SMS ticket is already operational.

5.3 ELB 7.3 APP for provider real time information

5.3.1 Measure Design

5.3.1.1 Detailed Description of Measures to be implemented including city context

The innovation element is the introduction of "light" localisation systems (AVL) as alternative technical solution to replace the standard AVM system adopted for PT fleet monitoring and management. The objective of the measure is the validation of the technical and operational viability of the adoption of such AVL system together with an innovative "knowledge-based" certification module and supporting procedures for the validation of PT service performances and the provision "real time" information services. This IT system is operating independently of the WP4 sharing platform.

The system designed by MemEx at the moment is in the implementation phase to be transformed from prototype to commercial form and will be installed on buses which comprise the seasonal passenger transport service towards the beaches.

5.3.1.2 Project Partners working on measure, roles and responsibilities

MemEx is the main actor of this measure as it has developed the prototype of the AVL System (CELSO) and is responsible for the commercial development of the system that can be used by small fleets. In particular, this tool will be used on the small buses that the Portoferraio and Rio Marina municipalities will finance in the summer to transport citizens and tourists to the beaches.

Rio Marina and Portoferraio will also participate in the measure especially to follow-up the results and for the data survey.

5.3.1.3 ITS Technology, system or service requirements

The functionalities of AVL CELSO are simple: the back-end centre processes and forwards service data to on-board devices. Through the specific **MOB App**, data with information on the operated service are collected. The data is sent to the control centre, either in real-time or when the vehicle returns to the depot/to an area covered by the operator’s W-LAN. The control centre processes, records and makes data available.

This simple architecture enables service data to be presented automatically to vehicle drivers through the MOB App (downloaded and installed on an on-board/driver’s tablet) receiving inputs from the operation control centre.

The **operation control centre** (whose structure can be modified depending on the size of the operator and of its fleet) manages, updates, processes and sends service data to vehicles (on board tablet) that, in turn, send real-time data back to the control centre. Data collected are reported in a **Front-end** for the **real time fleet monitoring** and also recorded and stored in a dedicated database for service reporting and service validation (CERT& information) comparing the scheduled and reported service.

The information flows processed by the system ranges from data collected by the sensor of the mobile device i.e. time and vehicle location, to data input by the driver (i.e. departure and arrival time, disruption events, vehicle conditions).

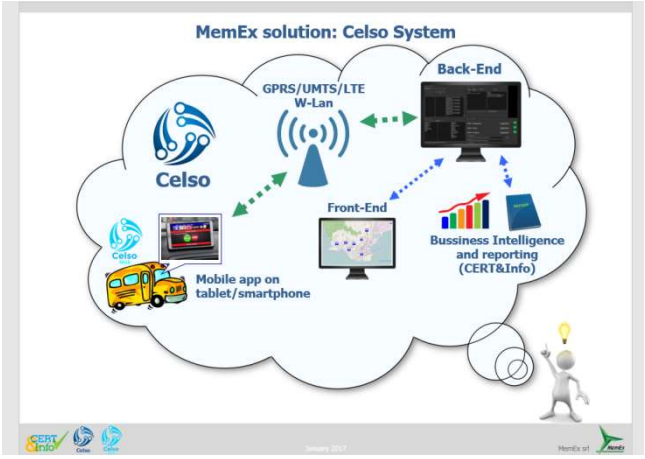

Figure 8 – ELB 7.3Celso system scheme

5.3.1.4 Procurement of services

The AVL System (CELSO) will be developed directly from MemEx without any procurement activity regarding the DESTINATIONS project.

5.3.2 Measure ex-ante evaluation

The CELSO system will be very useful in supporting transport providers to control their fleet quickly to overcome unforeseen events such as failures or accidents. For the users it will be very useful to know the location of the bus in order to access it on time from the bus stops.

The ex-ante evaluation of ELB 7.3 was listed in the category of impacts towards the Transport System and analysed on the basis of the providers' satisfaction level impact indicator and users' satisfaction level impact indicator.

The ex-ante estimation of the two indicators are: 80 % of providers and users satisfaction versus the 40% of the baseline.

5.3.3 Implementation Plan

MemEx is developing the commercial structure of the AVL prototype.

It is foreseen that the system will be ready in commercial form by month 12 and will be tested in the MemEx laboratory. After some tunings/modifications or enhancements, the system will be ready to be installed on buses and will be operational by month 21 (and hence ahead of schedule) in order to be fully operating by summer 2018. The data for the evaluation will be collected during the summer seasons 2018 and 2019.

It is noted that during the activity to perform the commercial form of the system, the possibility of implementing an APP to provide users with real-time information of bus locations will also be considered.

5.3.3.1 Risks and constraints

The risk is that MemEx cannot transform the CELSO prototype system into an operational one.

5.4 LIM 7.3 PT traveller information system and LIM 7.4 Mobility application and travel planner for smart phones to provide real time information

5.4.1 Measure Design

5.4.1.1 Detailed Description of Measures to be implemented including city context

For measure 7.3, Limassol will install 25 electronic signs on buses and bus stops connecting the tourist area to the city and old town. The electronic signs will provide information to users regarding waiting time, route and end of the route, ticket purchasing, etc. On buses, the scrolling signs will provide tourist information.

Limassol has identified the 25 bus stops where signs will be installed and has determined the technical specifications in collaboration with the Ministry of Communication and Works (Department of Public Works) for the procurement procedure for the scrolling signs, AVL service system and GPS on buses.

For measure 7.4, Limassol will develop an interactive application providing real time information and a Travel Planner. To date, several meetings have taken place with potential contractors to support the design of the technical specifications. In collaboration with the Ministry of Communication and Works, the technical specifications have been identified to ensure that the mobile application will be compatible with the PT control room of the Ministry to receive real time information. The call for tender has been published and sent to potential contractors. The evaluation procedure of the tender documents will occur in the next couple of weeks.

5.4.1.2 Project Partners working on measure, roles and responsibilities

In Limassol, the Limassol Tourism Company is the main project leader for this measure with the Limassol Municipality (partner no. 7) collaborating with the implementation of specific activities.

Limassol Municipality (partner no. 7) has approved the installation of the electric signs in the tourist area, and will be responsible for their maintenance. The municipality will participate in the process of the identification of bus stops names and will promote the measure through press conferences, press releases and social media engagement.

5.4.1.3 ITS Technology, system or service requirements

Limassol will use GPS sensors on urban buses to collect real time information. A central system will be in place to manage information sent to the electronic signs at bus stops. Electric signs at bus stops will provide arrival times and tourist information about nearby attractions, events and festivals. In addition, electric signs on buses will provide information about bus stops, end of route, sustainable mobility information and tourist information.

Limassol will install 25 TFT displaysinside buses:

- Hardware Content Device (media player suitable for buses)
- One off integration to achieve functionality
- Software – Content Management

25 Solar powered Bus Stop Displays:

- 25 Bus Stop Displays
- Bus Stop Names
- One off integration to achieve functionality

The interactive application will provide real time information, GIS mapping with a travel planner being incorporated in the service. The mobile app to be created will be in cooperate a content

management system to have full control over the data served by the application. The application will be securely connected to this system to retrieve all the updated information needed for its operation. The application will operate offline since it will include a system to store the data on the device supporting an offline mode. A GPS system will be incorporated with the application to allow users to locate information (maps, etc.) related to the current location. A push notifications service will be supported on all devices based on automatic mechanisms that are triggered by the user's options.

5.4.1.4 Procurement of services

Limassol will collaborate with the Ministry of Communication and Works for the procurement procedure regarding the purchase and installation process of the electric signs.

A call for tender was launched on 30/5/2017, for the creation and development of the mobile application and travel planner. It was awarded to T.C Geomatic Ltd.

5.4.2 Measure ex-ante evaluation

For measure LIM 3.1, baseline data has been collected by carrying out surveys, estimations and through data collection. Limassol has identified the following impact indicators that will allow the evaluation of the measure's implementation.

1. Economy: For the ''investment costs'' impact indicator, there is no baseline data, since it is the first time that such investment will be made in Limassol. It is expected that the investment will total to €609,985 (ex-ante).
2. Transport: For ''Accuracy of time keeping'' there is no baseline information available. However, it is estimated that at least 55% of buses will arrive on time after the implementation of this measure (Ex-ante). For ''Public transport service per head population'' and ''Average occupancy'' there is no available data that can be accessed by the Limassol Bus Company, therefore no baseline can be provided at this stage.
3. Society: The ''Citizens satisfaction on public transport'' impact indicator will be measured through carrying out surveys. As per the survey results of 200 participants, 14% of the population are satisfied with the PT system. It is estimated that more than 50% of the citizen's population will be satisfied with the PT after the implementation of this measure.

For measure 7.4, data will be collected through carrying out surveys and estimations. The following impact indicators have been identified:

1. Economy: '' average operating revenue'', ''investment costs'' and ''average operating costs''.
   There is no baseline data, since this is a new measure to Limassol. Average operating revenues and costs have not been estimated yet (ex-ante). The estimated investment costs will be €18,750(ex-ante).
2. Society: For the ''awareness level'', a small percentage of the population is aware of this measure through media publications (baseline). Regarding the ''acceptance level'', there is no baseline for the acceptance level, since this measure has not been implemented yet. It is expected that more than 65% of the population will be aware and accept this measure.

5.4.3 Implementation Plan

1. Specifications of electronic signs for bus stations and electronic scrolling signs for buses (September 2016 – December 2016). In collaboration with the Ministry Communications and

Works, an internal document has been prepared outlining the specifications for the electronic signs.

2. Determine the bus stops and buses for the new systems and acquiring permission for installation (November 2016- February 2017). Limassol has acquired permission for the installation of electronic signs on specific bus stations across the tourist area, as well as, permission from the Limassol Bus Company for the installation of electronic scrolling signs inside the buses.

3. Preparation of procurement documents and initiation of purchase process (December 2016-February 2017). The Ministry of Communications and Works will upgrade the PT service system of Limassol and will carry out the procurement process. Limassol will anticipate the purchase process of the electronic signs.

4. Arrangements of the central system location and operation (February 2017- May 2017). Limassol will develop a central system as part of the Ministry of Communication and Work's agenda of updating PT system services.

5. Purchase and importing of e-signs (May 2017 – August 2017). Limassol will purchase the relevant equipment as scheduled in the project timeline.

6. Installation of e-signs-name signs at bus stops - Setting up the central system (May 2017 – August 2017). After the purchase of electronic signs, the installation and the setup of the central system will be implemented by the Ministry of Communication and Works as part of their project for the upgrade of PT service system.

5.4.3.1 Risks and constraints

The identified potential barriers for measure LIM 7.3: Installation of e-signs on bus stops are communication/involvement among the main key stakeholders (Limassol Bus Company, Ministry of Communication and Works). The key stakeholders need to find a common agreement and proceed with the installation of the signs.

5.5 LPA 7.3 Real time mobility and tourism information services

5.5.1 Measure Design

5.5.1.1 Detailed Description of Measures to be implemented including city context

GuaguasMunicipales urban PT network has 818 bus stops located all over the city, and at least 81 bus stops have real time information system. There is also a smartphone app that allows customers to get updated information about real time information.

After annual surveys related to urban PT customer satisfaction, where the real time information system was pointed out as an essential issue to take into account, the company has decided to improve the main bus stops by extending the real time information system at 20 bus stops with screens powered by solar energy.

The bus stops where real time information equipment have been installed have been selected after carrying out a study where the physical features, number of customers, number of lines and other characteristics were taken into account.

The bus stops where solar real time information panels were installed are:

Bus Stop Code	Bus Stop Adress
15	C/León y Castillo (Oficinas Municipales)
46	C/Pérez del Toro, 13
74	C/Diego Betancor Suárez, 19
78	C/Eufemiano Jurado (Juzgados)
92	C/Blas Cabrera Felipe, F-306
116	C/Cordoba, 29
257	C/Pio XII (Estadio Insular)
270	C/PioXII, 29 (Colegio Teresiano)
274	C/Pio XII, 75
295	C/Obispo Romo, F-27
310	Avda. Escaleritas, 48
323	Carretera del Norte, 30
363	C/ Don Pedro Infinito
400	Avda. Mesa y López (Madera y Corcho)
409	Avda. Mesa y López (C.S. Alcaravaneras)
439	C/ Industrial José Sánchez Peñate (C.C. Las Arenas) Sur
441	C/ León y Castillo (Club Náutico)
610	C/ Alicante (C.S. San José)
636	Avda. Pinto Felo Monzón, 37
698	Avda. Pinto Felo Monzón, 17

Table31–LPA 7.3 bus stops selections for real time information panels

These equipmentare provided with new and innovative functionalities such as devices that allow customers to read the current balance of their contactless smart cards, and electronic devices to allow the visually impaired to know the updated arrival time by a voice system. Furthermore, the current urban PTapp will be improved to add more information related to the tourism market.

5.5.1.2 Project Partners working on measure, roles and responsibilities

The main partners of Civitas DESTINATIONS working in this measure are Guaguas Municipales as the company in charge of the urban PT services in Las Palmas de Gran Canaria as well as the Municipality of Las Palmas de Gran Canaria (in charge of the mobility and city planning service) and SAGULPA (public bike service and public parking company). CINESI will support this measure as company expert in urban PT.

5.5.1.3 ITS Technology, system or service requirements

In order to improve the quality perception, reduce uncertainty in waiting times and provide information to the traveller, 20 real-time information panels powered by solar energy have been placed at selected bus stops.

According to the main features of real time information equipment, they comply with the following requirements:

- It has to be compact enough to fit next to bus stops and no to disturb pedestrian at the sidewalk. (The solution selected has a 23 X 23 plant. It is allowed to install on almost any narrow sidewalk without interfering with the movement of pedestrians).
- Real time information equipment solar powered. Since it gets all the energy from the sun, the equipment does not need any wiring or connection to the mains. This reduces the cost and complexity of the installation, and increases the system´s reliability.
- The technical specifications are:
    - Photovoltaic panel.
    - Alphanumeric filing system
    - Reception and management of information
    - Solar power supply system
    - Access device for information for people with disabilities
    - 16-inch dynamic information display

Figure 9 – LPA 7.3 Real Time Information Panels in Las Palmas de Gran Canaria

5.5.1.4 Procurement of services

A tender process was launched on 22/08/2016 in “Boletín Oficial del Estado” for the acquisition of 20 real time information panels for Guaguas Municipales bus stops network.

It was awarded to CAPMAR S.L. CONSTRUCCIONES Y MANTENIMIENTO.

5.5.2 Measure ex-ante evaluation

For this measure Guaguas Municipales will provide the necessary data and information to perform the ex-ante evaluation. Las Palmas de Gran Canaria has identified the “Service reliability” impact indicator to evaluate the measure’s implementation.

Impact category	Impact indicator	Unit of measure	Baseline	Ex-Ante
Transport	Service reliability	Number and percentage of services arriving / departing on time	91,5%	-

Table 32– LPA 7.3 ex-ante evaluation

5.5.3 Implementation Plan

This measure could be divided in two different tasks.

On one side, the key tasks include the acquisition, installation and operation of real time information panels powered by solar energy at bus stops.

- A tender process was launched on 22/08/2016 in “Boletín Oficial del Estado” for the acquisition of 20 real time information panels for Guaguas Municipales bus stops network. It was awarded to CAPMAR S.L. CONSTRUCCIONES Y MANTENIMIENTO.
- While the construction stage of the equipment, several studies to select the most convenient bus stops to install the real time information panels were carried out. Physical features, number of customers, number of lines and other characteristics were taken into account. October 2016 – December 2016
- Installation of real time information equipment in January-February 2017.
- Real time information panels in full operation in March 2017.
- Development of a promotional video for social media to let customer know how to use the contactless smartcard reader integrated into the real time information panels and to disseminate Civitas DESTINATIONS. July 2017.

Figure 10 – LPA 7.3 Real Time Information Panels promotional video for social media

- Nowadays, a tracking of the right operation is being carried out.

On the other side, the key task includes the improvement of the current App of Guaguas Municipales that offers relevant and updated information about urban PT in Las Palmas de Gran Canaria.

- A study of the current functionalities and the number of user of the current urban PT App has been carried out in order to define what aspects need to be improved.

5.5.3.1 Risks and constraints

This measure has already been implemented. Some problems we have faced have been to deal with some vandalism against some real time information panels.

5.6 LPA 7.4 Integrated payment solutions for mobility and tourism

5.6.1 Measure Design

5.6.1.1 Detailed Description of Measures to be implemented including city context

This measure can be divided in two different tasks.

1) A new way of payment process will be introduced on vehicles and bus stops of the new BRT network.

So far today, passengers can pay the urban PT trips by cash (directly to the bus driver) or they can acquire in advance one of the multiple smartcards available in Guaguas Municipales urban PT fare and validate them once on the bus. Nowadays, the validation equipment is installed next to the bus driver, so all customers have to get on the bus by the front door.

The main idea for the BRT (MetroGuagua), is that all customers will pay in advance (not only those customer with smart card, but also those ones that pay by cash) and will be able to get on/off the bus by all the doors, regardless of the bus driver. These measures together with traffic light priority, exclusive BRT lane and the alignment between BRT buses and bus stops will allow the BRT line to be faster, more efficient, punctual and attractive for citizens and visitors.

Due to payment equipment operation is a critical part on day to day urban PT operation and new equipment and software will be needed, part of this new equipment will be tested and checked on current articulated buses of Guaguas Municipales fleet to check the adaptability and technical communication between several validation points and tickets machinesto avoid any problem related to payment equipment during first stages of BRT implementation.

2) Tourism is a fundamental pillar of the Canary Islands' economy, and in the last years, Las Palmas de Gran Canaria has been positioning as referent regarding tourism, especially when it comes to cruise and conference tourism.

So far today, the urban PT of Las Palmas de Gran Canaria has been focused just on citizens and residents trips, without taking into account that tourism could have some special needs regarding to urban PT.

For that reason, Guaguas Municipales is going to enlarge its tariff offer to include new kind of tickets focusing on tourism and leisure trips, especially for those who come for a short visit (from 1 to 3 days).The average duration of stay at accommodation in Las Palmas de Gran Canaria is 3 days and a significant number of visitors come to visit the city just for one day (cruise passengers or visitors from other municipalities of the Island, especially located in the south).

5.6.1.2 Project Partners working on measure, roles and responsibilities

The main partners of Civitas DESTINATIONS working on this measure are Guaguas Municipales as the organization in charge of the urban PT services in Las Palmas de Gran Canaria as well as the Municipality of Las Palmas de Gran Canaria, the organization in charge of the mobility and city planning service.

5.6.1.3 ITS Technology, system or service requirements

1)Given that Guaguas Municipales isdeveloping a new way of payment process for BRT customer, the followingequipment will be needed.

- Validators.

The next functional specifications are expected for the new validation machines:

  - Management of user interface:
    - Notification of ticket typology, expiration time, etc. on display.
    - Notification of the result of ticket validation through buzzer emissions differentiated in case of validity/not validity.
  - Smart card reading at a distance suitable not to impact on boarding and users operation.
  - Time/space validity check.
  - Data coding smart card in order to carry out the on-board control.
  - QR code management.
  - Credit Card payment management.
  - Registration of data related to validation and payments.
  - Data communication with the central system (configuration of fare/tickets, configuration and operation parameters, black list, validations and payments, diagnostics).

- ATM (Automatic ticketing vending machine).

The next functional specifications are expected for external automatic vending machine at bus stops.

  - Management of user interface:
    - Guided menu available in Multilanguage version.
    - Visualisation of guided information to support user interaction.
  - Management of user selection and digitations.
  - Maintenance and money (cash) collection management.
  - Tickets emission (multiple options available, see below):
    - Paper ticket.
    - Chip-on-paper (pre-coded or coded and printed “on the fly”).
    - Recharge of tickets (multi-trips, pass, etc.) coded on smart card.
  - Download of “white list” (list of the pass recharged by web).
  - Management of cash and coins introduction.
  - Change based on re-circulating circuit (use of coins introduce by the users) and the not circulating circuit.
  - Possibility to configure the max value of cash change (depending on the ticket typology and related price)

- In case of annulment (or expiration of time for selection) the machine gives back all the coins previously accepted and the last cash banknote)
- Visualisation of payment mode not accepted (i.e. no acceptance of cash due to the lack of coins for change, no acceptance of credit card due to failure of communication, no availability of receipt due to paper lack, etc.)
- Registration and transmission of selling and transactions data.
- Release of payment receipts.
- (Under maintenance environment) Identification of the state of the cash level and need for additional coins for change (re-circulating circuit).
- Management of the diagnostics:
  - At a predefined time interval, the diagnostics report is sent to the central system.
  - On events, the notification of the failure is sent to the central system.
- Transmission to the central system of the following information: cash/coins amount in the machine, pre-alert (paper is finishing) and alert notification (break-in attempt, failure, etc.)

- On-board switch/router.

The following technical specifications are expected for on-board switch/routers:

- Fast Ethernet fibre ports;
- Reduced dimensions;
- Broadcast storm filtering;
- Alluminium housing IP31;
- Temperature range for operation: -10 ~ 70° C;
- CE certification; and
- Automotive “E” mark (required for on-board installation).

Furthermore, a software development will be needed for the technical communication and adaptability of all these equipment.

2)To introduce this new kind of touristic tickets in the current Guaguas Municipales payment and ticketing system, some especifications must be taken into account.

- It will be implemented using the existing technology “Mifare Ultralight C cartón”.
- The time period will be defined by the urban PT operator.
- It will be a single use card (non-rechargeable).
- Touristic urban PT cards will come already coded and activated from the supplier.
- Each PT card will be serigraphed according to its feature.

5.6.1.4 Procurement of services

Tender process will be carried out for the acquisition of equipment.

5.6.2 Measure ex-ante evaluation

For this measure, baseline data will be collected by estimations and through data collection. Las Palmas de Gran Canaria has identified the impact indicators that will allow the evaluation of the measure’s implementation. The numbers of tourists travelling in urban PT buses is an indicator that currently does not exist, but that will be recorded once the measure is implemented.

5.6.3 Implementation Plan

This measure could be divided in two different tasks.

This includes the acquisition, installation and operation of payment equipment and the development of the software needed for the pilot test of the future BRT payment and ticketing system.

- In October 2016, a meeting with a company specialised in PT ITS tools was held to understand the kind of technology needed for this measure.
- In May 2017, technical support as part of task 8.3.1 was requested to Memex in order to get information about e-ticketing equipment and traffic light priority.
- In July 2017, a meeting with a company expert in Wi-Fi solutions into trains, buses and on other transport systems was attended to understand the requirements and needs to include this technology into the BRT system.
- Summer 2018 installation of payment equipment at bus stops and buses is expected.

On the other side, the development of a new kind of urban PT tickets focused on tourism for Las Palmas de Gran visitors and tourists.

- In October 2016, a meeting with a software company specialised in PT ITS tools was held to understand the kind of technology needed for this measure.
- In June 2017, first draft of the commercial design for these touristic urban PT cards has been delivered. New versions are expected to be done.
- In October 2017, business model kick off training will be held in Las Palmas de Gran Canaria, where it is expected to find out ways of revenues, to develop the right sale channels, and to face other issues related to these news touristic tickets.

5.6.3.1 Risks and constraints

Entrance into the tourism market and sale channels could be complicated. Some meetings with tourism stakeholders should be held in order to foster a sustainable mobility among visitors.

5.7 MAD 7.3 Smart PT traveller information service and MAD 7.4 Public transport open and smart ticketing system

5.7.1 Measure Design

5.7.1.1 Detailed Description of Measures to be implemented including city context

This task entails two different measures that strongly cross-fertilise each other. If MAD 7.3. is the head of the PT communication and organisation framework, MAD 7.4. is the tail and represents the other side of the PT service. These two measures will impact positively in an efficient AVL and ticketing systems and will therefore jointly redesign PT services, making it more tourist friendly and effective.

In concrete, MAD 7.3. HF will impact in the provision of real time information about the PT service. The smart PT traveller information service at regional level will include:

- Better information about PT and others sustainable modes online, such as the Madeira Tourism portal and other mobility and tourism stakeholders, including improved description of how to access points of interest or events.
- Include the PT service of other PT companies in the journey planners (Google Maps for example).

- New internal and external information website and tools to improve PT customer information. The website will adapt the service experience and information platforms to personal needs.
- Fleet control system with information for drivers about their schedule and 2 information panels.
- Real-time information panels that also offers assistance to travellers whilst they are on their journeys, anywhere and at any time.
- Information and ticket selling Kiosk for tourist with PT and tourist paper information.
- Implement an app, especially dedicated to visually impaired users, with real time information about when the bus is coming and where to leave the bus.

MAD 7.4 will be more directly focused on deploying smart technologies and will help to tackle the hurdle for PT users that are newcomers and need to plan travel arrangements and to access different operators and interrelated services, including PTs and other touristic services. Tourists are receptive to smart technologies and they are excellent to test and give feedback for the improvement process. The smart ticketing system will focus on tourists of all modes (land, air and water) to whom information and services must be easy and friendly, as they have limited time to understand and to use the PT network. One assumes that if the smart ticketing is effective with tourists, it will also have a similar impact among the local population, who will be, in the end, a strategic long run beneficiary.

5.7.1.2 Project Partners working on measure, roles and responsibilities

Measure	Partner short name	Activities description
MAD 7.3.	GUAGUAS	WP7 leader
	LTC and LIMA	Partners involved in the measure (LIM 7.3) - PT traveler information system
	LTC	Partner involved in the measure (LIM 7.4) - Mobility application and travel planner for smart phones to provide real time information
	RM, PF, and MEMEX	Partners involved in the measure (ELB 7.3) - APP for user real time information
	GUAGUAS, LPGC, SAGULPA, CINESI	Partners involved in the measure (LPA 7.3) - Real time mobility and tourism information services
MAD 7.4.	SRETC	The regional Secretary as the only transport authority in the Island will supervise and advise all the technological integration process
	AREAM	The environment Agency will support the regional secretary in all this process involving several different actors at all levels
	WP8 consultants	ISSINOVA and TEMA for the technology option and integration and business models

Table 33– MAD 7.3 & 7.4 Project Partners working on measure, roles and responsibilities

5.7.1.3 ITS Technology, system or service requirements

Regarding ITS technology, the Smart PT traveller information service has already purchased one scheduling optimisation software for public transportation which is now being adapted to HF characteristics and will start entering into force in January 2018. The PT operator has also

purchased a service to re-launch the mobile app which was turned off and will be subject to improvements in the future, so as to be adapted to blind people's needs and tourist queries. Other procurement processes will also take place.

In the ticketing measure, MAD 7.4., it should be noted that Horários do Funchal owns a contactless ticketing system based on the Calypso standard. The contactless ticketing system in use is regarded as a barrier for newcomers, especially tourists, which are obliged to learn how to operate it. The modernisation of the actual ticketing system is, therefore, essential to introduce a more user friendly way to use PTs.

However, the new system should be prepared to integrate other services such as sightseeing buses, cable cars, bike rental, etc., and for cultural and entertainment places, e.g., museums, theatres, etc., using plastic or paper contactless cards, printed optical codes and mobile ticketing. To prepare the system to deal with such features a Multi-Services Platform, and a Revenue Split Centre are required.

Furthermore two specific features of the ticketing system are essential for the integration of other DESTINATIONS measures, namely: Green Credits MAD 6.2 and Smart PT Traveller Information Service MAD 7.3.

The **main outputs** of these two actions can be summarised as follows:

- 1 new PT information website.
- 1 travel planner tool including information of all the PT operators in the Island.
- One scheduling optimisation software for public transportation.
- 10 new on-street information panels and2 test panel in HF headquarters.
- 1 new mobile app. specially designed for mobility impaired users.
- 3 new ticket selling kiosks.
- Creation and implementation of smart ticketing interoperable scheme.
- Evaluation guide lines of the different ticketing solutions.
- Complete pilot ticketing system tested and implemented in between 15 and 50 buses.
- Multi-services Platform.
- Revenue Split Centre and Web Services Farm.

The smart ticketing system is the cornerstone of all the strategy of regional public transportation in the Region. The goal is to modernize the central system of the current ticketing software as well as to clearly separate the business rules and the data framework (API) so than HF can be flexible enough to develop new business strategies. The framework of this measure is illustrated in the diagram below:

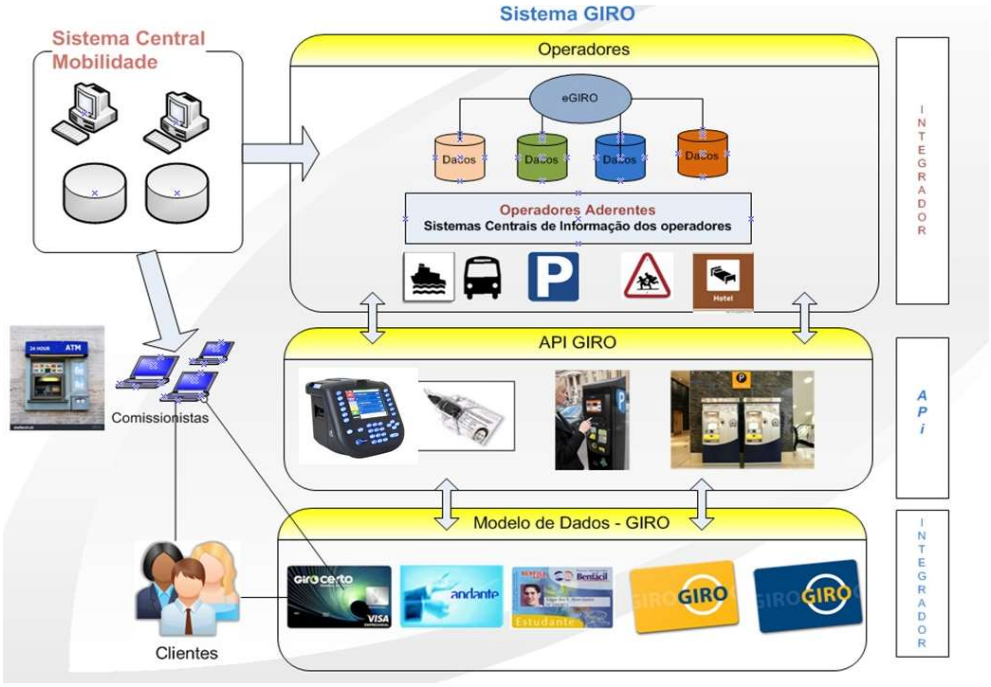

Figure 11– MAD 7.4 Framework

To leverage new communication products and to guarantee the sustainability of the PT business, it is equally important to mainstream the number of equipment onboard the HF buses. Currently the buses carry 7 components (see picture below) and thanks to the implementation of the *Smart PT traveller information service*, the number of equipment onboard will be merged into a single one, which will sharply reduce maintenance costs and the company energy performance.

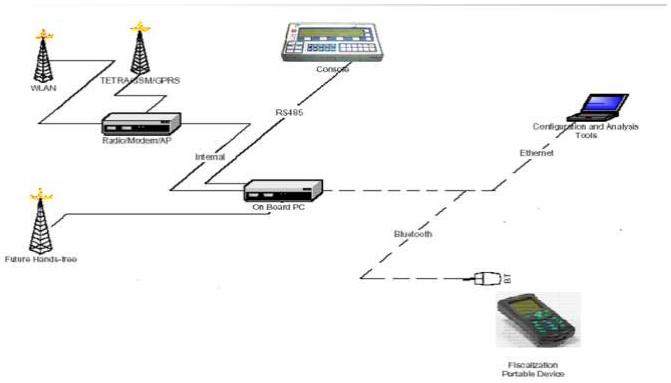

Figure 12 – MAD 7.4HF equipments on board

5.7.1.4 Procurement of services

5.7.2 Measure ex-ante evaluation

Measure Code	Impact category	Impact indicator	Unit of measure	Baseline	Ex-Ante	Target Group
MAD 7.3.	Society	Number of visitors to HF website *(CIVITAS Core Indicator 39 - awareness level)*	n.º	In 2015 the PT operator website received a total of 1.081.722, whereas us in 2016 the website received 1.294.440 visits	>10%	PT users
	Society	Number of downloads and usage of the mobile App. *(CIVITAS Core Indicator 39 - awareness level)*	n.º	In 2015, the HF BUS received 608.988 visits. In 2016 the app. has had problems and was turned off	new target (not in GA): >10%	PT users (both tourists and locals)
	Economy	Ratio PT operational revenues and costs *(CIVITAS Core Indicator 1 - average operating revenues)*	€	*In 2015 HF had 1.4 Million Euros of positive cash flow (revenues related with PT service) Data from 2016 will be introduced during the month of June 2017*	+2% of PT operational revenues	PT operator
	Society	Quality assessment of the new mobile app. among mobility impaired users using PT (*CIVITAS Core Indicator 40 - accepance level)*	%	Baseline will be filled in June 2017	new target (not in GA): +10%	Mobility-impaired citizens
	Society	Quality assessment of HF mobile app. among tourists (*CIVITAS Core Indicator 40 - acceptance level)*	%	Baseline will be filled in June 2017	new target (not in GA): +10%	Tourists
	Society	Satisfaction rate (with the available options to purchase tickets) (CIVITAS Core Indicator 39 - awareness level)	%	2014 (SEEMORE survey) 54% of tourists have received/seen information about travel options other than by car (93,4% of which rank it as good or very good)	+10% tourists aware of mobility options	Tourists

	Transport	Reliability of the new AVL system (measured in terms of number of times the system crashes and number of hours required to retrieve the system) City specific indicator	Nº	In 2016, the AVL system crashed 156 and the average number of hours necessary for the problem to be solved was of 587	new target (not in GA): decrease the number of times the system crashes in 10%	PT users
	Society	Satisfaction rate (with the available options to purchase tickets) (CIVITAS Core Indicator 41 - citizen satisfaction with transport system)	%	*Data from 2017 will be introduced during the month of June 2017 when the first evaluation campaign is carried out*	new target (not in GA):	Cruise ship visitors
MAD 7.4.	Society	Satisfaction rate with the new ticketing scheme (CIVITAS Core Indicator 41 - citizen satisfaction with transport system)	%	2014 (SEEMORE survey) 44,8% of tourists stressed that ticket options in Madeira are good. We need to collect baseline data for locals as well	new target (not in GA): +10%	PT users (tourists)
	Transport	Reliability of the new ticketing system. City specific indicator	%	Due to be collected in June 2017	new target (not in GA): increase reliability in 10%	PT users
	Transport	Reliability of the new ticketing system (measured in terms of number of times the system crashes and number of hours required to retrieve the system). City specific indicator	Nº	In 2016, the ticketing system crashed 587 and the average number of hours necessary for the problem to be solved was 24	new target (not in GA): decrease the number of times the system crashes in 10%	PT users
	Transport	Reliability of the new ticketing system (number of passengers with information of route number and bus stop where they board the bus). City specific indicator	%	In 2017, a sample of validations between 01.01.2017 and 15.01.2017 show us that 87,0% of passengers have information of the route number and 86,6% have information of the bus stop where they get on board	new target (not in GA): increase reliability in 10%	PT users

Table 34– MAD 7.3 & 7.4 Ex-ante evaluation

5.7.3 Implementation Plan

Mil.	Milestone /activity description	Concluded	Month	Current situation
	Design and specifications		4-12	
7.3.1	Define the technical requirements for a support system to bus exploration (interaction with MAD 7.4.)	N	4-12	Even though some needs accessment work has been carried out, this action is delayed and the new foreseen date to launch the prototype of the AVL system is now November 2017. The pilot will be tested in 15 buses. These buseswill be among the 20 that are equiped with the eco-driving system purchased inMAD 7.1. to guarantee that all data is properly collected for evaluation purposes.After implementing the pilot, HF wishes to implement a *Next Stop* sound alarm (linked to the new AVL system) to support visually impaired users.
7.3.2.	Define the technical requirements for a new website	Y	4-8	The new website technical requirements were prepared during the design and specifications phase and therefore this activity can be regarded as closed. The next step is to launch a call for tender during the implementation phase.
7.3.3.	Define the technical requirements for a new app about mobility for tourists and residents	N	6-12	HF has recovered the old HF app which was turned off. Now the goal is to update the app with new features that can be valuable and useful both to commuters and occasional users (such as tourists). The ultimate goal is to turn the application into a dematerialised PT card, embedding it with a Host Card Emulation and to test this scheme in the frame of MAD 7.4.
7.3.4.	Define the technical requirements for a new scheduling software	Y		This task is fulfilled. HF has performed a needs assessment analysis and then launched a call for tender which has been successful. The next semester will be used to fine tune the system to local needs and to conduct a training program targeting the company experts which will handle the tool.
7.3.5	Define technical requirements for online system integrating all transport options	N	4-12	
7.3.6	Define technical requirements to develop a prototype of panel to install on street providing real-time information	N	4-12	HF and ARDITI have met and started to discuss the development of a low-cost real-time panel. A concrete product has not yet been described, nor produced.
7.4.1.	Survey draft	Y	1-7	Instead of an external survey, HF has carried out only a self-assessment analysis among its workers to check what was working in the current ticketing system and what was not.
7.4.2.	Definition of the baseline indicators of the measure for the evaluation	Y	7	Contribution to D9.1. was delivered
7.4.3.	Definition of requirements for the acquisition of the ticketing system, the Multi-services Platform, the Revenue Split Centre and the Web Services Farm	Y	2-14	HF has produced several drafts compiling ticketing system needs assessment.
7.4.4.	Specification of the ticketing system, the Multi-services Platform, the Revenue Split Centre and the Web Services Farm	N	4-8	The specification of the new ticketing system, the multi-service platform, the revenue split centre and the web services farm are not yet concluded. There are still several options open and a decision from the company board is pending,

Table 35– MAD 7.3 & 7.4 Implementation Plan

5.7.3.1 Risks and constraints

	Potential Drivers	Potential Barriers	Activities to be taken to mitigate the barriers	Risk assessment (low, moderate, high)
MAD 7.3.	Problem related	Position	The measure is considered to be a cornerstone of HF strategy in order to provide better services to the general public. However, it is strictly linked with other DESTINATIONS projects and even with other external cofounding opportunities (e.g. ERDF).	Moderate
		Organisational	It might be difficult to integrate the information with other PT companies and other services such as taxis.	Moderate
MAD 7.4.	Problem related	Position	The measure is considered to be a cornerstone of HF strategy in order to provide better services to the general public. However, it is strictly linked with other DESTINATIONS projects and even with other external cofounding opportunities (e.g. ERDF).	Moderate
	Problem related	Technological	Open solutions and standards are not yet the mainstream in PT companies andtransport autorities too	Low
	Problem related	Physical/spatial	Regulation (***EC***) No 1370/2007 is a major opportunity to develop new software and hardware solutions for the pubic transport companies, making them compulsory in the frame of contract agreements. However, this measure is highly dependent of external suppliers but	Low

			Madeira might use some expertise in human/computer interaction to cope with this barrier.	
		Financial	Incentives are required to involve other regional partners and make the ticketing system really multi-task	

Table 36– MAD 7.3 & 7.4 Risks and constraints

5.8 Summary ofIntegrate Mobility and Tourism information and payment services

Within the task 7.6 “Demonstration Integrate Mobility and Tourism information and payment services” among the sites, different solutions have been taken into consideration.

On the one hand, Las Palmas de Gran Canaria, Limassol and Madeira are going to install real time information equipment at selected bus stops. Furthermore, Limassol will also installed electronic scrolling signs for buses.

On the other hand, Elba, Limassol and Madeira will launch a specific App for PT whilst Las Palmas de Gran Canaria will improve its current App by incorporating relevant information for tourists who travel using PT. Elba MOB App will support the implementation of the new AVL system and Limassol and Madeira App will offer PT real time information as well as a travel planner.

Regarding payment services, Las Palmas de Gran Canaria will set up a pilot test to check the adaptability of the technical equipment (validators, switches and AVM) needed for the BRT that will be in operation by 2021. Touristic cards (1-3 days) will be also developed by Guaguas Municipales.

In Elba, integrated payment is being developed by SMS whilst Madeira will redesign their ticketing systems to introduced smart ticketing interoperable system.

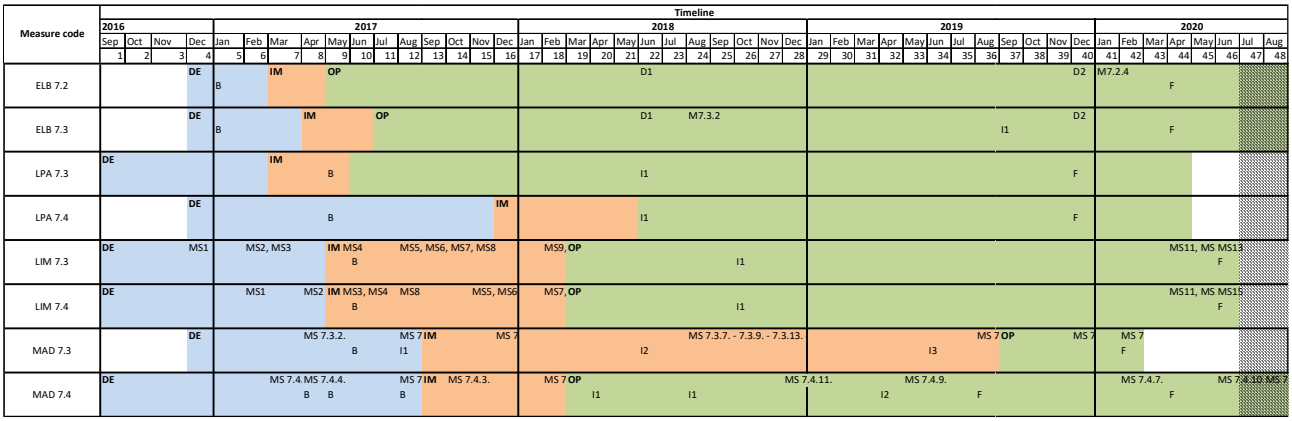

Tabla 37–Integrate Mobility and Tourism information and payment services Gantt Chart