



EU Civitas Destinations Project

Shared Use Mobility Agency in Elba island: from the concept to the IT Platform

Author:
Giorgio Ambrosino



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Giorgio Ambrosino



June 2018

CIVITAS DESTINATIONS Project “Elba Sharing” Local Project

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Introduction

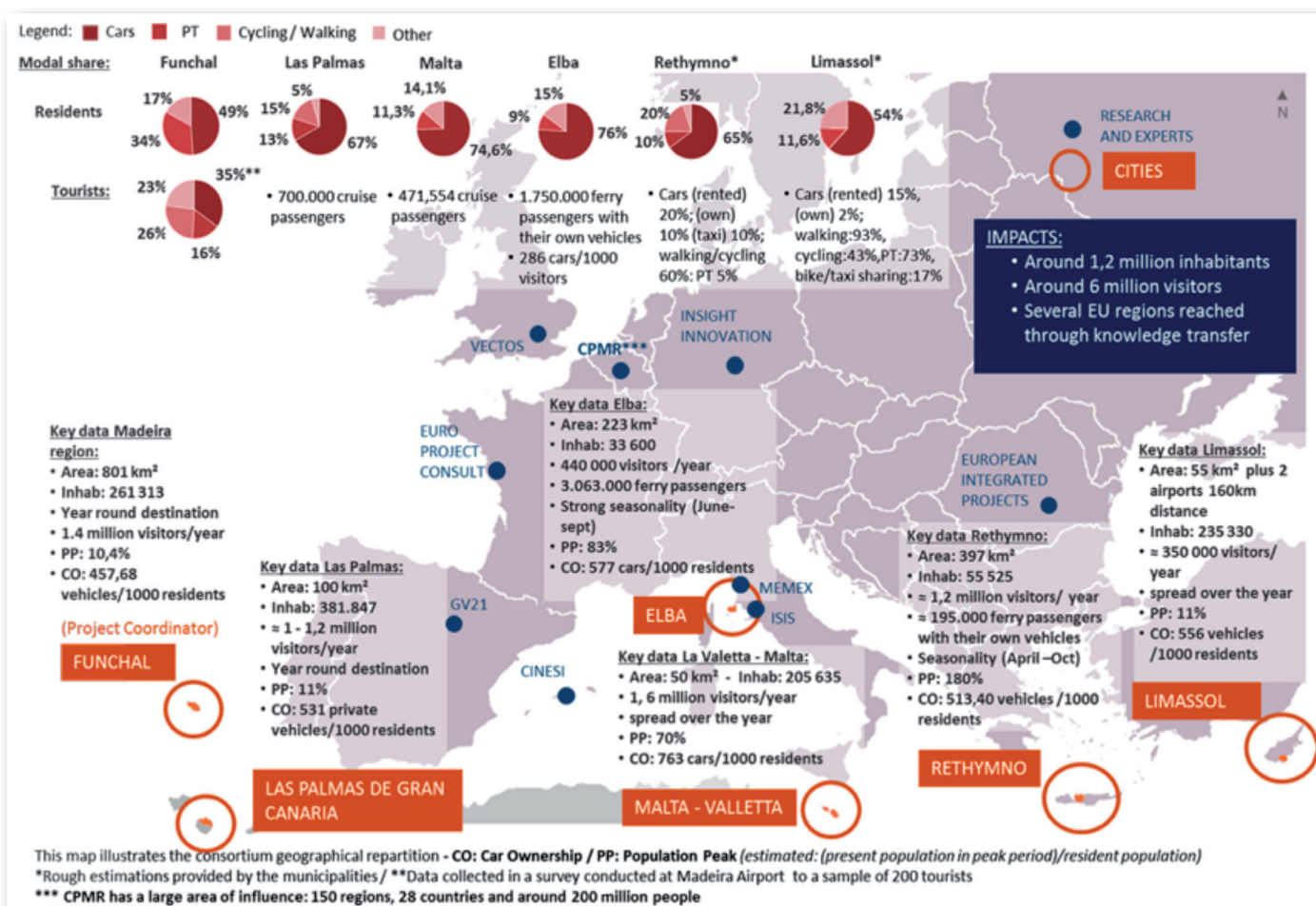
CIVITAS DESTINATIONS is one of the three biggest projects on sustainable mobility funded by the European Union CIVITAS Initiative (<http://www.civitas.eu/projects>) part of the European Research Framework Horizon 2020 (H2020).

DESTINATIONS Project, started in September 2016 and lasting over 48 months, involves 29 partners coming from 10 European Countries and four cities from China. The main project objective is to achieve a sustainable mobility for residents and tourist realizing measures and innovative solutions in these sectors: car-Independent life style, clean fuels and vehicles, collective and flexible public transport, demand Management, Integrated sustainable mobility plan, innovative crowdsourcing and users involvement tools, intelligent transport systems for access control, urban freight distribution and city logistics.

CIVITAS DESTINATIONS combines research activities, targeted pilot demonstration and regulation policy actions and involves a significant number of innovative measures interesting mobility, public and flexible transport and logistics that are developed, tested and implemented in six European cities. The locations are some of the most tourist destinations in Europe: Funchal (Madeira-Portugal), Rethymno (Crete-Greece), Las Palmas (Gran Canarias-Spain), Limassol (Cyprus), Elba Island (Italy).

CIVITAS Destinations sites are some of the most tourist destinations in Europe

Figure 1
CIVITAS DESTINATIONS Consortium



The innovative approach promoted by CIVITAS DESTINATIONS project is based on the integrated planning and operation of different mobility services, each of them well targeted to specific needs and targets.

Referring to the Elba site, a **Shared Use Mobility Agency (SUMA)**, developed as one of the foreseen measures, will act as an “umbrella” platform/organization able to co-ordinate the different shared mobility services with the conventional public transport services in order to increase the sustainable and full accessible mobility and to act as a backbone of seamless and MaaS initiative. The Shared Use Mobility Agency will offer integrated access to several “on demand and shared” individual and collective services, by co-ordinated management of the various actors and services through an ad-hoc organization framework, technology platform and soft measures.

1. Integrated Urban Mobility approach

1.1 Current challenges and trends in Europe

The different reports produced in the last decade on the urban mobility at European level show that old and new challenges continue to afflict the towns and urban areas: unsolved and “well known” problems as traffic congestion and pollution are still on the ground, added to this, in recent years and even more in the future, urban mobility is substantially changing due to emerging societal trends and new demand which is becoming more and more differentiated in terms of users segmentation and needs.

Cities in Europe continue to grow. Currently, over 74% of EU-28 citizens live in urban areas, a proportion expected to exceed 80% by 2030. This creates challenges for policy makers and transport stakeholders, in terms of mobility, city accessibility and connections from the centre to/from neighbourhoods but also health and quality of life.

Furthermore, the mobility demand is becoming more and more flexible in terms of users segmentation and needs, use of transport mode, time of use. People are always on the move (work, social education, pleasure, health, ...). Smartphones, internet and social media channels are transforming the traditional mobility concepts which were based on the differentiation of users segmentation and transport modes in a similar way to the transformation of the access and use modalities of a large part of personal, community and public services.

“Virtual mobility” is the emerging concept pushed by citizens aiming to consider mobility services as a seamless offer in terms of co-modality, integrated access, payment and use of services without matter of the mode and single operator. Users ask to be more flexible in choosing their transport modes, even day by day or trip by trip but not being penalized in terms of accessibility, information and tariff schemes.

Moreover, the increased flexibility on demand side lead to the request of tailored and customized service to suit niche groups and individual needs. Another emerging trend which is becoming more and more significant in USA but also in Europe (especially among the young generations as millennials) consists of the increased preference of ridesharing services whereas the possession of a car is largely decreasing. This follows the general transition from ownership to sharing concept.

These mobility trends could probably change the approach for car use in the future: on the other, for sure, they have already pushed the growing of alternative ride sharing schemes.

Ridesharing services cover a wide range of flexible and intermediate individual and collective transport modes: from well-established schemes as bike and car sharing to collective taxi and car-pooling, from dynamic ridesharing services to peer-to-peer transport schemes and new forms of “institutionalized hitchhiking”. Ridesharing schemes are pushed by the mobility trends described above and until now they have been successfully deployed mainly by commercial operators

Over 74% of EU-28 citizens live in urban areas, a proportion expected to exceed 80% by 2030.

The mobility demand is becoming more and more flexible in terms of needs, transport modes and time

“Virtual mobility” as emerging concept

Increased preference of ridesharing services

Ridesharing services available schemes

*Public Transport still
a backbone
for mobility offer...*

*... but still fragmented
and uncoordinated
at a certain level*

*We cannot achieve
sustainable urban
mobility system
without an efficient,
extensive and accessible
public/collective
transport services: we
need to improve its
quality and to integrate
it with flexible services*

who applied the available technologies (smartphone, web access, ICT platform) and applied innovative marketing and business approaches to service schemes which were already been developed and introduced.

Nevertheless, it must be considered that bus services are the primary form of public transport in European cities (conventional bus services globally represent the largest part - between 50% - 80% - of the whole PT offer and this situation will last in the short and medium future despite the current trends on the mobility). It is evident that the adoption of any effective mobility solution must include Public Transport as key component.

Despite its relevant role in the mobility offer, the Public Transport is not able to overcome its “Cinderella” position in particular in the medium and small urban areas where Public Transport potentials are affected by poor image, unreliability and low performances. Even if relevant achievements have been accomplished in terms of the integration of data and end-users services (multimodal real-time info, interoperable payment tools) among different operators and ITS, standardization, etc, the mobility offer is still largely fragmented in terms of ticketing, info, marketing and accessibility. Historically the mobility sector is customized to a “classification view” on services, transport modes and user segmentation but currently the traditional contrast between collective and individual transport solutions is gradually blurring. More than this there is a lack of validated private-public collaboration schemes and business models across Europe.

The experiences of most advanced cities and towns in the world highlight **that we cannot achieve sustainable urban mobility system without an efficient, extensive and accessible public/collective transport services**. This should be a “must” to be considered in any Urban Mobility Planning (SUMP) initiative considering that the first form (and oldest) of ride-sharing is a “BUS”.

Therefore in urban areas, especially for the small and medium sized European towns the target should be form one side to enhance the quality and accessibility of conventional Public Transport services (targeted to main axis/connections) and from another side to better integrate PT services with flexible schemes (to be “revamped” by Public Authorities) and emerging ridesharing services (to be used as “integration” and not “alternative” to PT) properly designed to serve last-mile/feeder services and targeted users groups.

1.2 The Concept of Shared Use Mobility Agency (SUMA)

The approach of “Elba Sharing” within the CIVITAS DESTINATIONS project focuses on the need to reconcile and enhance the two parallel axes of urban mobility (collective transport and flexible/ridesharing services) by testing and demonstrating different innovative mobility solutions to be integrated under the “umbrella” of the Shared Use Mobility Agency (SUMA) for planning and managing the different transport services.

The Shared Use Mobility Agency (Figure 2) addresses the two main levels of urban mobility in a coordinated way, where both public (collective) and private components interact with each other: major transport axes and corridors, on the one hand, and flexible/ridesharing services on the other. Fostering the interaction between public and private mobility through various connected mobility schemes

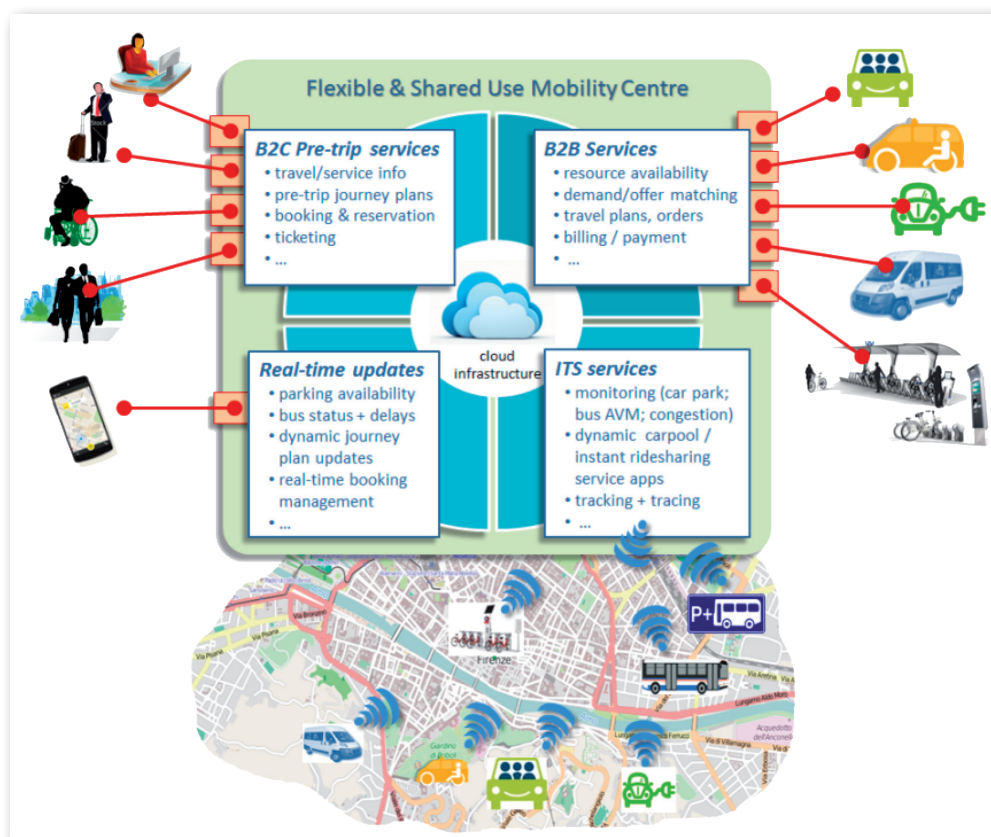
(parking, P+R, interchange facilities with shared vehicles schemes, integrated payment, etc.) is pivotal for improving urban mobility as a whole.

To achieve seamless integration between collective and shared mobility the Shared Use Mobility Agency works on three interrelated levels (collective transport, personal mobility and connected systems). The Shared Use Mobility Agency will offer integrated access to several “on demand and shared” individual and collective services, by coordinated management of the various actors and services through an ad-hoc organization framework, technology-enabled services and soft measures.

Therefore the Public Transport Authority could act as promoter of the Shared Use Mobility Agency based on a set of main functionalities as the following ones:

- **Integration of data** and platform: open data layer and data security;
- Provision of **integrated trip planner**;
- Managing common **payment tools** and clearing procedures;
- Managing **Integrated Booking**;
- **Real time information** and user feedbacks management;
- Resources optimization and **Networking** different operators;
- **Integrated PT services** design (Convention with FTS and ride-sharing services);
- Managing **shared and ride sharing services**;
- **Data quality assessment** and operated service validation.

The above could also act as base for any MaaS initiative tailored to the urban areas and service context. The Shared Use Mobility Agency (**SUMA**) was tailored and personalised around the mobility demand and the territorial context of ELBA island in order to answer the needs and requirements of residents and tourists.



Main SUMA functionalities

Figure 2
Shared Use Mobility Agency-SUMA

2. Destinations Project in Elba

Shared Use Mobility Agency: the common approach defined at Destinations project level

The increasing interest in ridesharing services as possible solutions for different mobility needs (related to specific user/citizens groups or to the specific areas/zones or time period, etc.) is confirmed by the presence of different sharing schemes (i.e. car and bike sharing, demand responsive seasonal services etc.) among the actions planned in the different DESTINATIONS Project sites.

The main approach discussed and defined in DESTINATIONS is that Public Transport Authorities (PTA) and Public Transport Operators (PTO) should properly collaborate in order to manage the different ride sharing services as integration and completion of the public transport offer rather than being considered as alternative solutions. In this approach the ride sharing services from PTA and PTO point of view are analyzed both with respect to the transport services design (i.e. as feeder services for last/first miles connected to the “conventional” services based on fixed timetable and route) and with respect to the operation in terms of integration and user information.

In this context, one of the main measure in ELBA is the development of the Shared Use Mobility Agency (SUMA) as centre for managing and making accessible several “on demand and shared” individual and collective services, coordinating different various actors and services supported by an innovative Information and Communication Technology (ICT) platform.

2.1 Elba Island context

Elba Island is located in the Mediterranean Sea around 10 km away from the Tuscan coast and is the third biggest Italian island covering 225 sqkm. area.

Elba island is one of the main tourist destinations in Europe, not only for

*Figure 3
Elba Island and its location
in the Mediterranean Sea*



Italians but also for foreign travelers coming from Central Europe (Germany, Switzerland, Austria, France, Belgium and Netherlands) and looking for blue sea, beautiful beaches and outdoor experience (hiking and mountain bike, diving and snorkeling).

Elba is famous around the world for harboring French Emperor Napoleon in 1814 during his exile. But its history goes back to prehistory as demonstrated by the archaeological findings and several memories of its glorious past.

The number of annual tourists is 450.000/year with a daily presence of about 30.000 people/day in summer season where the tourist flow is still largely concentrated.



Elba island as tourist destination

*Figure 4
Elba Island landscapes*

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, Rio (union of Rio Marina and Rio Elba in 2018).

Portoferraio and Rio municipalities are partners of the CIVITAS DESTINATIONS project representing the entire Elba island (since they are ports connected to the continent and are therefore most concerned with mobility problems) and realizing the project measures for the entire island.

In Elba Island the mobility offer is fragmented in terms of ticketing, information, marketing, accessibility and cooperation. There is in fact a number of web portals/app masters dedicated to tourist services, providing also information on some mobility services (i.e. ferries, public transports) which currently work as "single" web portals in non-coordinated network.

A coordinated mobility offer including collective and private modes will be an added value in Elba 's attractiveness, sustainability and overall accessibility and could also have relevant impacts on potential new job opportunities.

Institutional framework and scope of participation to Destinations project

*Figure 5
Administrative boundaries of Elba Island*



Situation of public transport offer: unanswered needs from residents and tourists

Moreover, the existing PT services are ineffective in providing suitable integrated solutions which could boost the use of PT services. In fact, they are not able to satisfy residents' needs with respect to the systematic trips (during the winter and summer period) and the last/first km for reaching the outskirts and small villages.

The public transport services are also not suited to tourists needs who are unable to easily find correct and updated information on Elba public transport services and thus prefer the use of private vehicles to move around the island. Moreover, public transport services (mainly the extra urban ones) often have 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 during the summer season.

This results in a low percentage of public transport use corresponding to only the 14% of the services offered. The situation of mobility and public transport services is therefore very difficult both during low season, for the limited services available, and during peak seasons for the high traffic congestion due to tourists' private cars.

2.2 Needs and design principles

The current mobility demand/offer: the identified weakness and challenges...

The problems affecting the mobility are the following:

- High seasonal mobility demand (from early morning to late night)
- Dispersed origins, few concentrated destinations (beaches, discos/bars, camping, museums and archeological sites, etc.)
- Low use of PT services (only for 14% of the overall trips), private cars and motorbikes are largely used but in some cases they are not the most suitable transport mode due to parking scarcity and poor accessibility of a wide range of destinations
- The offer of bike-car-moto rentals is increasingly high but it fails for coordination

The "Elba Shared Use Mobility Agency" provides answers to the local needs identified in the design phase:

- In Elba the mobility offer is fragmented in terms of information, marketing, accessibility and cooperation. Indeed there is a number of web portals/apps dedicated to tourist services, providing also information on some mobility services (i.e. ferries, public transports) but currently they are not well networked. **A coordinated mobility offer "brokered" by a unique Agency** will be an added value in Elba 's attractiveness, sustainability and overall accessibility.
- Car/Bike sharing systems do not represent effective solutions in Elba context. In fact, from one side, national operators have not demonstrated any interest mainly due to the low demand existing in Elba (both residents and tourists already have a mean for their trips), to the dispersed area characteristics and to no profitable return. From the other side, the investment and operation costs Local Authorities would have to sustain to maintain these systems are not sustainable in Elba context. The design of the Agency is based on the **networking of the local vehicles (i.e. bike/scooter) operators** on the island in order to optimize the available resources and to create a suitable

... and how the SUMA will contribute to solve them

offer to be integrated with PT. Furthermore, **the user** him/herself can **act as mobility service provide** contributing to solve the conflicts between the Public Transport services and the individualized mobility.

- The existing PT services are ineffective in providing suitable integrated solutions in particular in facing the demand increase during the peak season (over 30%) and they are not able to duly respond to the tourists needs. A **coordinated offer of ride/vehicle sharing services** for last-mile trips and dispersed/variable demand **must be integrated** to Public Transport services.

The innovativeness concept of the SUMA lies in the fact that users have a unique point of access to all information on the overall mobility offer in a consistent and efficient way (information, booking, etc.) and that it functions as a “broker” for the management and coordination of the different flexible and ridesharing services integrated with conventional public transport services.

The SUMA is supported by an “umbrella” platform/organization able to coordinate different transport services (in primis the ride sharing services) in a seamless mobility offer integrated with conventional PT services.

At that stage the enabling technological infrastructure for the SUMA was based on the emerging paradigm of the Internet of Services or Service Orientated Approach (SOA), providing several core facilities including:

SUMA as innovative concept: a unique point of access to mobility including ridesharing brokerage

Figure 6
Shared Use Mobility Agency in DESTINATIONS proposal



Different kind of services offered by SUMA

- services for transport users (Business-to-Consumer (B2C) services) enabling access to information, search for transport options, travel planning;
- services for the co-ordination of different ride sharing and mobility schemes and the interaction with the relevant operators (Business-to-Business (B2B) services); and
- services supporting the interactions among different authorities and entities involved in the mobility planning and control of transport services (Business-to-Administration services).

In particular, at that stage the main functionalities and services of SUMA have been identified and drafted as design ride sharing services integrated with PT services, monitoring ride sharing services, unique user interface, real time information and user feedbacks management, resources optimization and coordination.

Finally, the Local Authorities has been identified as promoter of the SUMA for contributing to start up the organization able to manage the SUMA and to support the seven Elba Municipalities for the mobility and transport planning and problems.

On this basis the activities carried out both for requirements definition and functional design have tuned the above approach and model in order to answer the identified needs.

2.3 SUMA requirements

Starting from the above context, the activities of user requirements analysis have involved the different stakeholders for analysing the mobility needs of residents and tourists by specific workshops and concertation meetings.

This activity has allowed the refinement of the concept of SUMA in a structure dedicated not only to manage the ridesharing services but also to provide infomobility service to residents and tourists and to support the seven Local Authorities for the mobility planning and document management issues in relation to the high level authorities (Livorno Province and Tuscany Region),

In particular, the results of requirement analysis are synthesized in the following Table 1.

Figure 7
Car/scooter/ bike/boat sharing service managed by SUMA



TITLE	REQUIREMENTS
Elba Shared Use Mobility Agency (SUMA)	<p>SUMA, is the structure dedicated to plan, manage and coordinate the different ride sharing services, user infomobility services and mobility planning support. The SUM Agency structure is based on three relevant dimensions: ICT platform, backstage and services operation and model business/organization.</p> <p>The Macro components of the SUM Agency have been identified as the following: Ride Sharing Planning and Management, Infomobility Services, Operators Networking and Open Data Layer.</p> <p>Macro components have been specified in terms of functionalities and use cases under the activities. The tracking functionalities is one of the key service of the SUM Agency that will be implemented as one of the functionalities of the platform.</p> <p>Moreover, the SUM Agency involves management resources both for operating the overall services (ride sharing, infomobility, operators networking) and for keeping and maintaining the ICT platform and the backstage support conditions.</p> <p>For the SUM Agency organization (operation, costs and revenue, etc.) the business model activities in under development.</p>
Car/scooter/bike/boat sharing	<p>The results of the feasibility analysis carried out on the potential of car sharing/bike sharing for the Elba Isle and on the related operational/organization impacts suggest to involve these services in the ride sharing platform managed by the SUM Agency.</p> <p>The reasons behind this choice are several:</p> <ul style="list-style-type: none"> - the well known national operators (Car2go, Enjoy, Share'n go, DriveNow e ZigZag, Comunicare, etc.) have not demonstrated any interest mainly due to the low demand existing in Elba (both residents and tourists already have a mean for their trips), to the dispersed area characteristics and to no profitable return; - need for a private person to own specific qualification and complex lease agreements for accidents (accidents, insurance, etc.) to be able to share his/her car or boat with other people - the island's morphology which shows sensitive altitudes and distances between the various touristic interest points thus hindering bike sharing services. The hypothesis to manage these services directly (by the commitment of the Local Authority) has been left too, due to the relevant costs in terms of investments, maintenance and operation and for the negative experience made by some other Municipalities on the direct management of these services. <p>In the end, the analysis carried out on the existing bike/car/scooter/boat rent providers on all the Elba area pushed to design the foreseen services as services supported by the ride sharing platform through the networking of the related service operators. The services operators, through the platform, will be able to expose their services in terms of all statics and semi dynamic information on their offers (e.g. location of the bikes depots, typology of the bikes, etc.). All the operators that have a resource to be shared (first of all the parking areas close to the beach for which information on the location and semi-dynamic information on available lots can be exposed by the platform through the app and the web) will be included in the platform.</p>
	<p>The "Ride Sharing Platform" is the ICT structure (sw environment, sw procedures, HW components, etc.) supporting the SUM Agency in the management of ride sharing, infomobility services and service operators networking.</p> <p>The requirements of the platform have been defined on the basis of the main macro components identified for the SUM Agency. The platform presents functionalities dedicated to: data collection, integration and management from different sources (systems, services, and procedures), data / information exposition and accessibility by different media channels and devices (web, smartphone, etc.).</p> <p>The main components of the platform are the following:</p> <ol style="list-style-type: none"> a) Open data layer for the collection aggregation and accessibility to the mobility and service data and information; b) Management of service operators networking and support to mobility observatory; c) provision of the infomobility services; d) provision and management of ride sharing services. <p>Around these four main components there are support functionalities as the security tracking function (that could be activated during the ride sharing exploitation).</p> <p>The platform is connected/interfaced with the users by web and app services. The platform therefore is the central and key element of the SUM Agency.</p>
Increasing feeling of security among Elba sharing users tracking for Elba-sharing service users: app	<p>As stated above, this measure has been analysed and defined as one of the main functionalities of the ICT platform supporting the SUM Agency. In particular this specific functionality is part of the macro component "ride sharing services" and will be activated (by a section of App connected with the Ride sharing platform) when a user will achieve the ride and during the trip.</p> <p>Therefore the user will be tracked (after enabling GPS on their mobile phones) during its trips, thus enhancing their safety feeling and making them more willing to largely use the Elba ride sharing services.</p>

Table 1 - ELBA Requirements

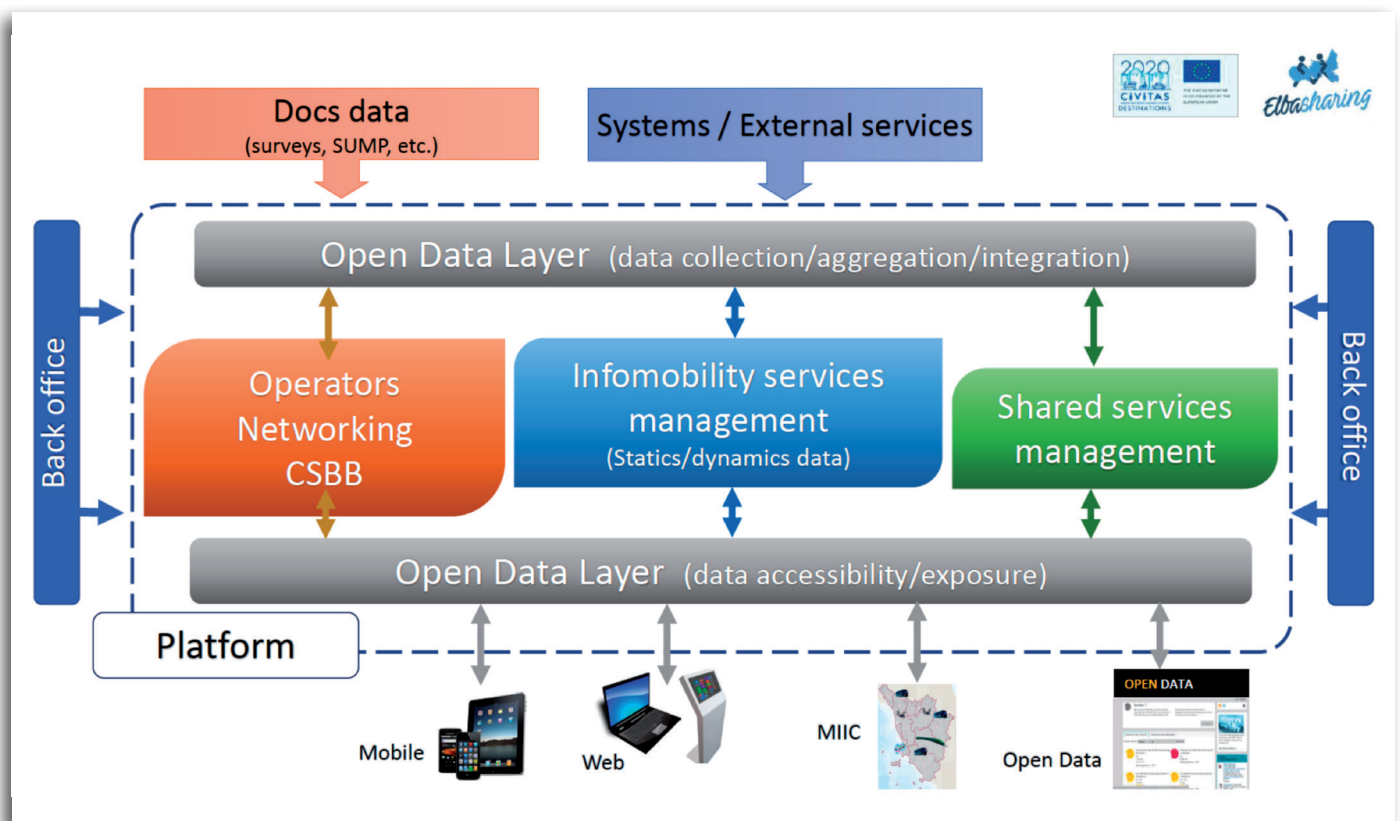
3. Elba Shared Use Mobility Agency

Based on the above requirements the SUMA was defined as the centre for the provision of infomobility and ride sharing mobility by the following main defined components aiming to:

- collect, aggregate, make available and accessible in open data modality the mobility and transport data and information;
- provide infomobility services;
- manage the observatory of the mobility and transport services on the Elba island with the interactions with the province and regional levels;
- network ride sharing operators and provide added-value services for end users.

Figure 8
Structure of the Shared Use Mobility Agency

The structure of the SUM Agency is schematized in the following figure.



The figure highlights the relations among the different planned measures and tasks, including the Open Data Layer emerged under user needs and requirements identification. The requirements of the identified 4 macro components of SUMA have been fully analysed and detailed.

A synthesis of the identified requirements is provided in the following.

- **Elba Open Data Layer:** is the macro component focused on data information collection and data exposition/accessibility (in open data modality by web and APP) on the different mobility and transport services operating in Elba Isle.

Main SUMA components

On one side this component collects and integrates the data coming from the different systems/services/procedures active on the network (including documents in the different formats/standards); on the other side, this component homogenizes and makes available these data for exposition by APP or web and for the provision and management of the related services.

Different users/actors should be able to simply access and manipulate these data depending on the defined user profile. The Elba Open Data Layer is the key component of the platform.

- **Elba Operators Networking (CSBB) and Mobility Support:** this component aims to realize and share a repository for all the information and documents supporting the mobility and transport services planning for the Elba Isle. These data and information should be collected by at least two modalities: automated (i.e. using online questions, implementation of collection campaign, etc.) or manually (i.e. acquisition in the repository of mobility documents by the input of a specific operator). This information adequately formatted and aggregated by the Open Data Layer is the base of the Observatory component. This allows some service as Mobility Manager for a specific entity (i.e. school) or the use of the specific road network model. Moreover, this component realizes the level of networking among the different operators that offer CSBB services. The platform exposes the related service offers in terms of available resources (i.e. for the bike rental it will be possible to find out the nearest depots, the number of bikes typology availability, the tariffs and services times, etc. through the app/web.). This approach, allowed by the platform, is also useful for other services like the parking service in terms of location, number and availability of lots, etc.
- **Infomobility Services:** this component provides specific multimodal infomobility services through the management of data communication with the Elba Open Data Layer component and the elaboration of the collected data. This level prepares and aggregates the collected data and the information contents for the different infomobility services provided on the different media channel managed by the platform. One of the services to be provided at this level is the multimodal journey planner and the provision of the public transport service arrival time at each bus stop (thanks to the interface ensured by the Open Data Layer with the PT fleet control system already active on the Elba network
- **Ride Sharing Services:** this component is dedicated to managing some specific service based on the “ride sharing scheme” as “share the same trip”. Some specific ride sharing services have been defined and detailed under the user requirements definition activities. In particular, different user cases concerning the concept of “Message board for sharing trips” have been defined: the user through the specific APP could declare his/her position and the destination he/she wants to reach by sharing the trip with other users/drivers. The “Message board for ride sharing” has been instantiated for the following possibility/options:

 - **Share a trip:** the user (who is in the ferry, disco, beach or other Point of Interest - Pol) asks to share a trip for some Elba localities by activating the APP that connects him/her with other users nearby and by indicating the destination and the departure time. The aim of this service is to allow users

reaching /moving away from the island to share a trip to/from the beaches or other Pol.

- **Shared trip plan:** through the App the user is able to plan a trip by choosing the departure/arrival points, the dates, time and routes agreeing them with other users who are planning a similar trip
- **Tracking the shared trip:** the aim of this service is to provide a functionality devoted to the safety of the users during the trip, since, once activated in the APP, the position and the trip is monitored and the user is given the possibility to send an evaluation and/or emergency messages
- **Share a taxi trip:** the aim of this service is to optimize the needs of the users to allow them to share a taxi trip and related cost with the possibility to meet at the taxi stop or making a common call to the taxi
- **Hitchhiking:** the user, from any place along the predefined routes, activates the APP and sends a request message for a trip that the APP makes visible to other users. This service is similar to the “share a trip” service. The aim is to provide a trip to any location on the island within a network of predefined routes.

Moreover two other functions have been detailed to support the operation of ride sharing schemes: the first is the certification of the users reliability, the second is the tracking of the trip and the configuration of security alert to be notified.

3.1 SUMA functions overview

The requirements analysis allowed to identify and specify the SUMA structure and the ICT platform in relation to the open data layer, networking, infomobility and ride sharing services management. Therefore, the main SUMA components have been designed in terms of functionalities and main technical characteristics and features. Clearly the ICT platform plays a key role for operating and managing of these components.

SUMA has been defined and specified as structure, dedicated to plan, manage and coordinate the different ride sharing services, user infomobility services and mobility planning support. The design activity has, moreover identified the aspects and constraints to be faced during the Business Model development parallel activities including different dimensions (from the legal approach that the company dedicated to manage the SUM Agency should adopt, to the organization, operation, data flow responsibilities, privacy aspects, etc.).

These should be investigated in the Business Model (BM) process analysis and study. In any case the main question, faced by the ELBA Authorities was/ is how the SUMA and the related components (from ICT to the ride sharing services) could be sustainable from an economic point of view and how the SUM Agency should be organized. In chapter 4 some first elements of the BM are outlined based on CANVAS method.

The BM process is going to start in order to define most suitable mechanisms or criteria to make SUMA self-sustainable (i.e. payment at the subscription, publicity spaces, etc.).

Therefore the ICT platform, as already stated, plays a key role in the SUMA structure in order to allow the provision of infomobility and ride sharing services and the management of the mobility observatory for the overall Elba Island.

Cross-relations between SUMA functionalities and business models in the design phase

In this context the SUM Agency facilitates data and information collection from different sources, such as:

- systems and mobility services active or planned in the short period on the Island;
- crowdsourcing campaign, on line questionnaire/survey, feedbacks from users, etc.;
- administrative procedures (documents, regulations, mobility acts, etc.).

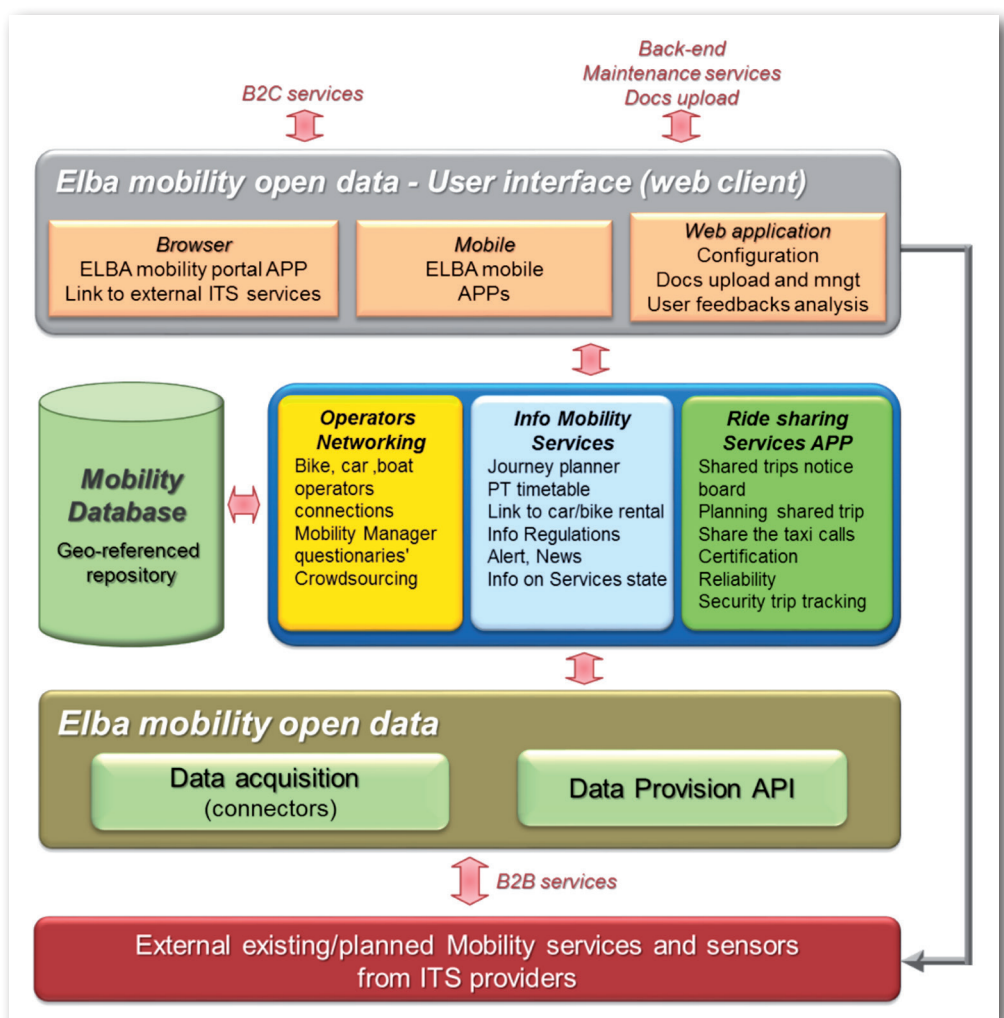
It also allows the data/information aggregation and integration of the information needed for the provision of information mobility services, ridesharing services and the mobility observatory capability.

As stated above the main components of the platform are the following:

- Open Data Layer;
- Operators Networking (CSBB) And Mobility Support;
- Infomobility services;
- Ride sharing services.

The functionalities of the overall platform and for each macro component have been detailed and specified under the design activities. The following figure show key functions of each main components and the level of details that have been defined during the design phase.

A synthesis of the functionalities design for each macro component is briefly reported below:



Introducing SUMA functionalities

Figure 9 Platform Components and Functionalities

ELBA OPEN DATA LAYER

Three levels have been specified for this macro component:

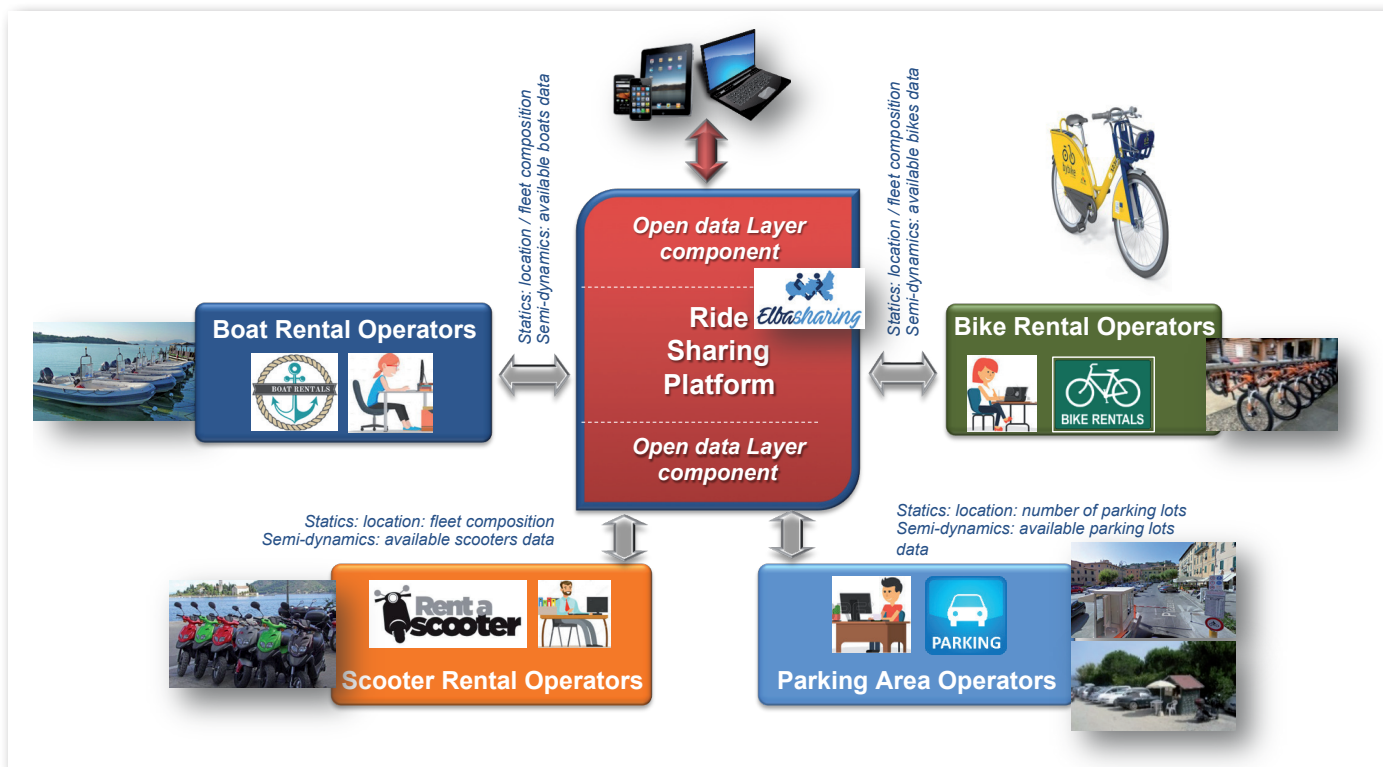
- I. Collection of the different information typology and elementary data
Automated direct collection of the data and information generated by the different ITS systems and mobility services or made available by the different Authorities/Entities managing or contracting the different mobility and transport services. The modalities for collecting the information/data (static, semi dynamic and dynamic) could be different depending on the typology of data source, such as:
 - Automated data collection through crowdsourcing campaign or online questionnaires' management;
 - Collection by input of the operator; and
 - Uploading documents, pdf, etc.
- II. Aggregation and integration of the information and data
 - Realisation of a centralised and unique georeferenced database;
 - Realisation of a documentary archive; and
 - Elaboration and aggregation of the info and data making available defined structured data.The information and data (static, semi-dynamic and dynamics) to be collected refer at least to these different domains: parking area capacities, public transport timetables, ferries, railway services, bike/car/scooter rentals, bike usage patterns, EV recharge stations, regulation for accessibility and freight logistics in every Elba Municipality, alarms, meteo, news, etc.
- III. Exposition/Publication/Accessibility to data and information
 - Formatting and exposition of the data and provision of the service to the final source (B2C services); and
 - Exposition and accessibility to the data base by the Authorities and third part users (B2B services).

OPERATORS NETWORKING (CSBB) AND MOBILITY SUPPORT

This component is supported by the Open Data Layer that allows the user to collect documents and data through a specific interface. The data to be elaborated and aggregated at this level concern the following issues: survey results and counts campaign, results from specific surveys (i.e. mobility manager), existing docs on mobility situations, documents and data collected during the SUMP development, regulations for the accessibility to the Elba cities/village, parking and freight regulation, etc.

The main functionalities specified for this macro component part are the following:

- networking of the car/scooter/bike/boat (CSBB) service operators allowing all the functionalities for updating the information of the services and to expose it in the platform through the web and app channels. This approach will also be followed for other services (like the management of available parking lots). The following figure shows the logic flow and function of this main component:
 - Online management of surveys such as a mobility plan for specific mobility destinations (i.e. mobility manager of school);



- Crowdsourcing functions for the involvement of citizens in the choice and mobility.

Figure 10
Elba Operators Networking (CSBB)

INFOMOBILITY SERVICES

This component is dedicated to the provision of the infomobility services to the user by APP or web. The main functionality aspects are the following:

- Management of the user's requests sent by the user on the different information;
- Formatting and managing the aggregated data;
- Management of local database; and
- Connection to the Open Data Layer for the answer to the user.

The related functionalities for getting the information by APP or web are the following:

- Statics/dynamic info on railway ferries, public transport services,
- Statics information (rules, services tariff, time table, location of the different parking areas, taxi stops, car/scooter /bike rent providers, etc.;
- Statics and dynamic freight loading/unloading freight lots;
- Statics/dynamic info on PT services;
- Traffic info statics/dynamic (congestion period, flow behavior, main road bottle necks);
- Statics/dynamic info on the bike rent provider;
- Statics/dynamic info on EV recharge stations;
- Multimodal journey planner;
- Statics/dynamic info on PoI;
- Statics/dynamic info on parking and traffic limited zones regulation of the seven Elba Municipalities (PDF);

- Municipal acts on mobility;
- News of public utility information;
- Link to the other exiting web services (booking and payments, car rental, etc.);
- Alert and weather forecast;
- Management of the feedbacks of user on the services;
- Travel diary; and
- On-line open or closed questions for the evaluation of the different new mobility proposals or existing services.

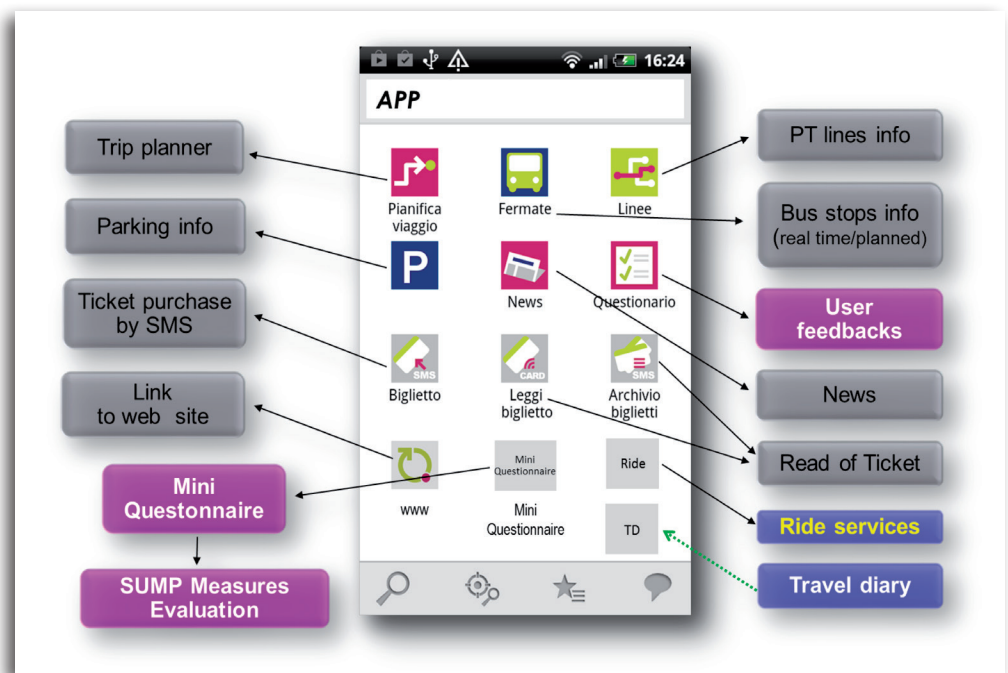


Figure 11
Infomobility APP

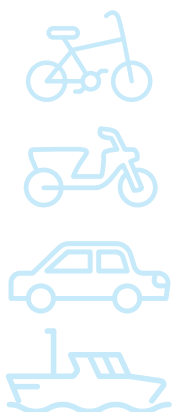
RIDE SHARING SERVICES

This component allows:

- the management of different ride sharing schemes, in particular:
 - Sharing a trip to some Elba localities when the user is on the ferry;
 - Planning in advance (for visualization on the messages board) the trip to be shared;
 - Sharing the trip when the user is in some specific location (beach, Pol, etc.) indicated also as "certified Hitchhiking"; and
 - Sharing a taxi trip/call meeting at the same taxi area and at the same time.

From the related use case defined in the requirements phase the main functionalities have been identified as the following (among the others):

- Provision of the shared notice board for messages related to trip requests; each user could post his/her own messages and contact others;
- The shared notice board allows access to all the information needed for the "trip/ride sharing" such as: presence on board the ferry, identity and reliability of the users to share the trip with, etc.;
- The shared notice board allows for "trip planning" before the trip; this means to post the request for trip sharing before the day of the trip itself (once the visitor is planning their stay in Elba);
- Possibility to join and to make contact between the driver and the user requesting the trip on the basis of the location, the destinations, the requested



time, and trip and user preferences in order to match the demand and the offer;

- Management of the subscriber group ensuring security and reliability of each user/driver;
- Invitation of subscribers to provide the required info on the trips, timing, transport mean, timetable;
- Management of user feedbacks (updating the reliability levels, the possible conflicts, etc.).

Moreover, this component provides specific functionality for:

- The certification of the reliability of each user (both as the service provider-driver and as service user/passenger);
- Provision of security tracking during the trip (GPS tracing, start up, good trip end, etc.) with the intelligent modalities;

The following figure presents the functionality chain scheme for this macro component.

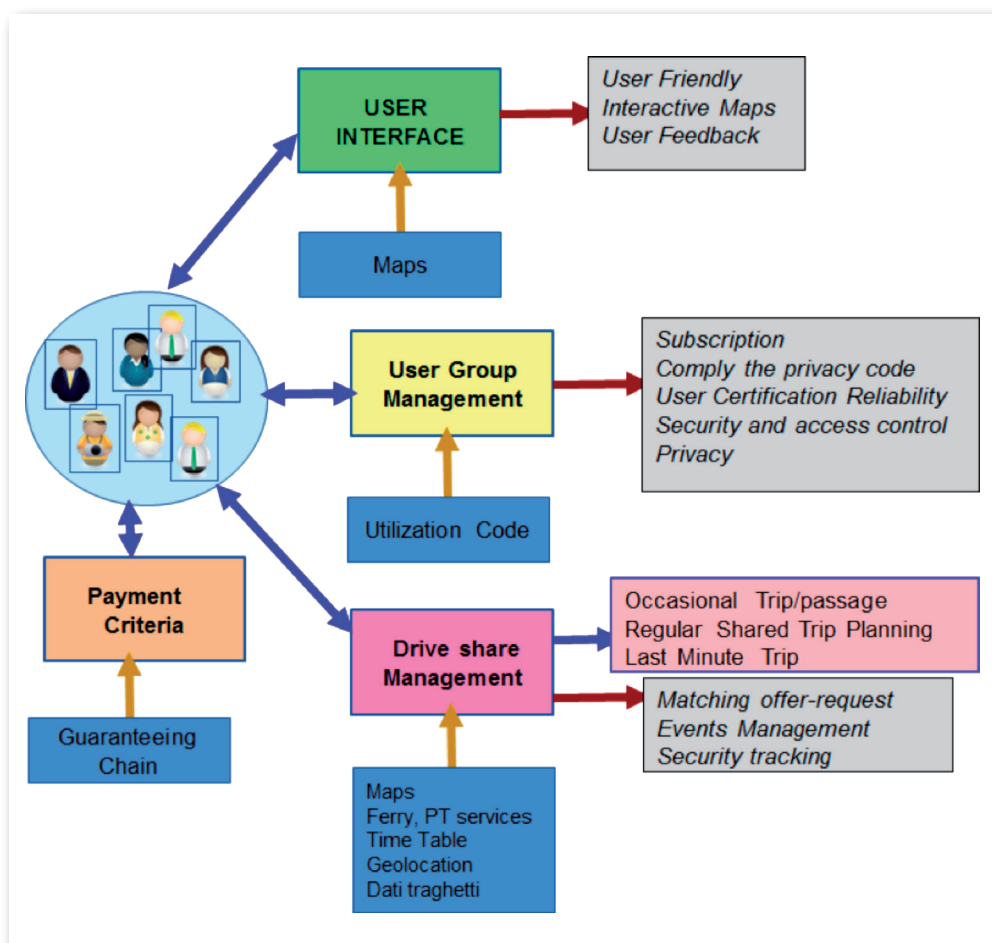


Figure 12
Notice Board Ride Sharing Services

3.2 ITS Technology, system and service requirements

The physical architecture will be based on in-house HW structure or in “cloud” depending to the sw solution that will be provided on the basis of the functionality design summarised above.

The architecture should be developed with the SOA and based on different standards as W3C (web services), XML formats for the data exchange among

Standard for data exchange protocols and format

the different applications. Moreover for interfacing the systems and services the more popular standards should be used like DATEXII, SIRI, etc. depending on the typology of system to be interfaced.

Finally, specific protocols and standards should be defined and used (like HTTP) for the security aspects and crypto format for the privacy issues. The GFS standards for data modelling and transferring will be used and API will be used for accessing and interfacing the platform. The figure 13 illustrates the scheme of the backstage of the Application sw interaction.

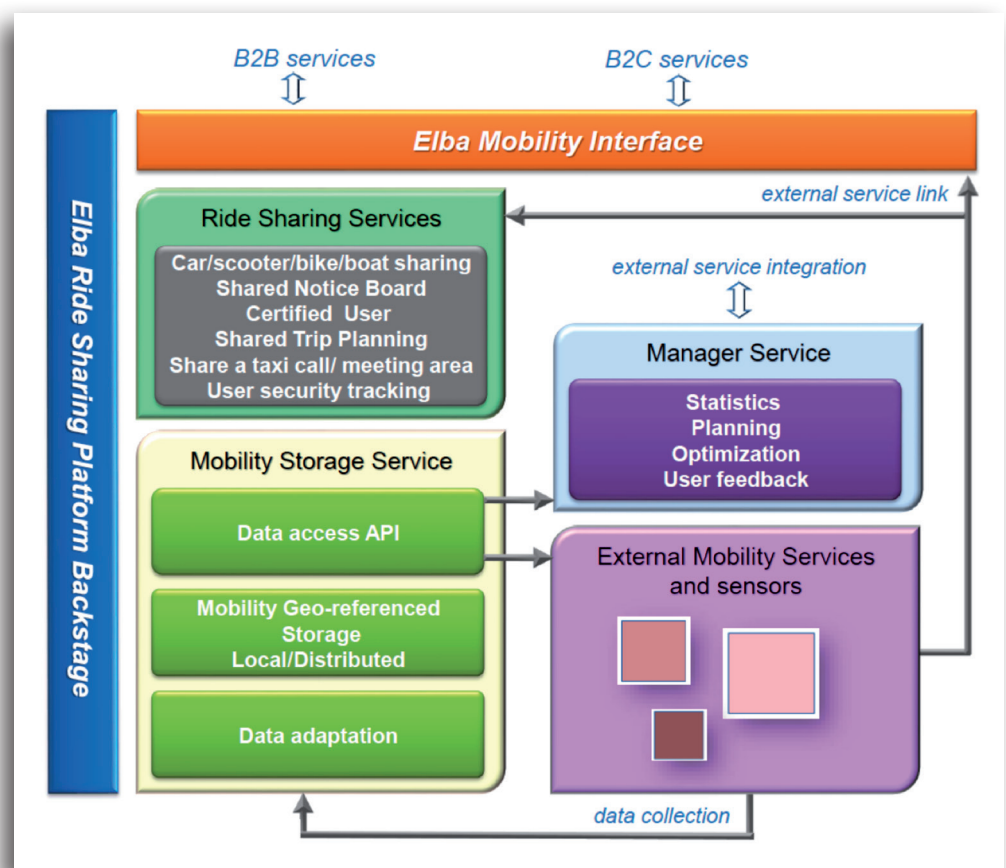


Figure 13
Backstage of the Application sw
interaction

Operational requirements

The specific aspect of the physical architecture is, in any case, left to the solution that the providers will describe answering the call for tenders.

At any rate the platform should:

- present a user-friendly interface with a specific own "look and feel" based on the use of interactive maps for supporting the location selection;
- be realised as a multi-application platform (Android, iPhone, Windows);
- use where possible Open Source environment and sw;
- manage the subscribers with the verification of the identity and using specific access rights;
- comply with the security ICT criteria suitable to the ride sharing services (cyber security);
- comply with the privacy requirements and data protection under the current national law;
- be sized to the foreseen users and performances;
- provide a regulation to be presented by the APP and to be accepted for confirmation by the user to access the service.

The figure 14 shows a scratch scheme of the main defined architecture:

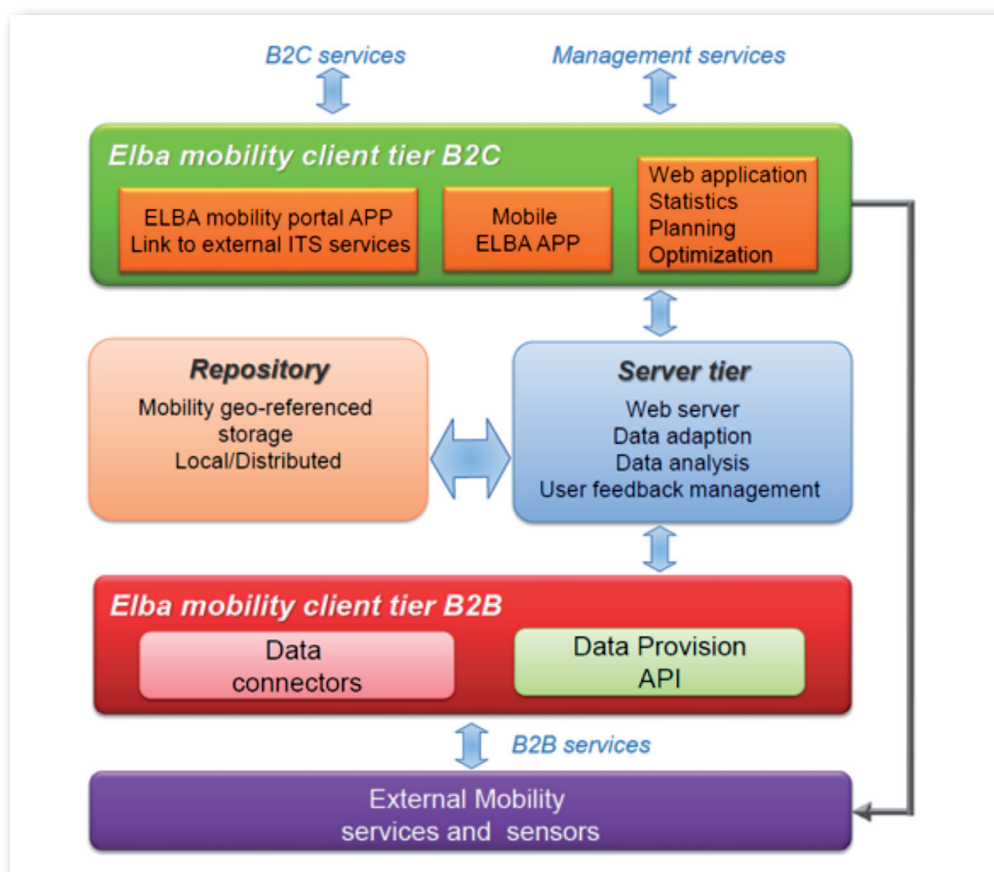


Figure 14 Scheme of the main defined architecture

3.3 Procurement of services

As already stated, the SUMA management (structure) will follow from the identification of the business model for the SUMA and the evaluation of the different impacts and needed organization, operation dimensions.

For what concerns the Platform, this will be acquired by means of the public procurement process. On the basis of the requirements, specifications and design results the technical annex for the bidding process have been realised (with all the administrative needed documentations) and the call for tender was launched in December 2017.

3.4 Operation of the SUMA in ELBA

The definition of the specifications for IT platform of the Agency runs in parallel with the definition of operational/management procedures and related business model. In particular a CANVAS model is under development in order to prove the economical sustainability of the Agency after the end of demo action funded by CIVITAS DESTINATIONS project.

The first result achieved has been the stakeholder’s identification and engagement. The stakeholder include the Municipalities, the Tuscany Region (as Authority regulating LPT in the region), Local Administrations as Livorno shire, mobility operators, planners, etc. The responsibilities of each actor have been defined.

Operation procedures for SUMA management

Secondly the end-users segmentation of the services provided by the Elba Shared Use Mobility Agency has been defined starting from the early adopters (pioneers). The value proposition of the services provided by the Agency will enable to identify the channels to reach the end-users and to define the most effective promotional activities.

The operational procedures for the management of the Agency have been defined. The procedures include:

- Monitoring of data gathering processes from connected sources;
- Updating/management of data repository for SUMP;
- Updating/management of static contents used to provide infomobility service;
- Assistance to the networked operators of vehicle sharing services;
- Assistance to end-user related to the management of ridesharing services.

Then the following cost category have been considered: internal staff (two operators are estimated to be required to operate the Agency), sw maintenance, utilities and promotion.

The revenues will come from the end-users registered to access ridesharing services, networked operators and involved private stakeholders.

3.5 Next actions and timeplan

As stated above, the design of the Elba Agency has been finalized in October 2017. The services and functionalities of the Elba Agency have been specified including the related requirements.

The call for tender to subcontract the ITS platform was prepared in October-November 2017 and launched in December. The ITS platform will be purchased under a supply schemes including technical services supporting the implementation, training of operators and one-year warranty. The bid offers were received in February 2018. The foreseen deadline of the conclusion of the tender process/bid evaluation was May 2018 with the start-up of the contract in June 2018. A demo pilot of the Elba Shared Use Mobility Agency will be in operation by October/November 2018: the demo will include the infomobility services related to the mobility services/ITS already operated and the networking functionalities. After the extension with the provision/management of ridesharing services, the Agency will be fully in operation in summer 2019.

*The Agency will be
fully in operation
in 2019 summer*

4. Canvas Business Model First Elements

Following the CANVAS methodology the first possible elements of the Business Model already analyzed by the Elba Sharing Team are provided. The in depth BM definition activities will be carried out from the end of 2018 based on the first results and pilot demo of the SUMA platform.

4.1 Problems

The main mobility problems are the congestion and the overcrowded roads during summer months both in the two main axes that connect the harbor (Portoferraio) to the rest of the island, and with the inhabited centers, Portoferraio in particular.

The congestion is due to a considerable flow of vehicles and is the cause of a wide range of related problems that negatively affect the overall quality of the environment and the lives of residents and tourists, such as among others:

- traffic congestion in the urban centers of the eight Elba Municipalities;
- parking difficulties and consequent unauthorized parking in areas close to the busiest beaches;
- noise pollution;
- road safety problems.

The public transport, which in the summer period is used for almost 34% of its capacity, can hardly increase its utilization percentage (modal shift) in an economically sustainable way, due to its low frequency and rigidity.

Finally, during the winter period, the lack of LPT services is evident, both in terms of frequencies and timetables (with the exclusion of specific times slots linked for example to school openings/exits during which, however, all buses are overcrowded) and coverage of the different areas of the island.

Starting from the analysis of these problems, within the framework of the DESTINATIONS project, the Shared Use Mobility Agency was conceived as a possible solution, specifically based on schemes for sharing the journeys (ride-sharing).

4.2 Users segments

It is estimated that two main segments of target customers of the overall mobility demand will use the Shared Use Mobility Agency:

- the **tourists**. For example, some tourists prefer to leave their car in the hotel and profit from passages offered by other cars to reach the beach/POI; the tourists who prefer to leave their car at the port of Piombino (saving the high cost of car transport) and who will exploit the ferry trip to agree with people carrying their own cars on the ferry and going towards their same direction/place to share a trip for reaching a specific location;

- the **residents** who will use the shared trips in the same way of the tourists or to go to the main centres, to supermarkets or to the different inhabited areas of the island. In the winter period, the main meeting points could be obviously different as the destinations and the places of aggregation will change (e.g. collection of students at the school exits).

Added to the above mentioned target users of the APP/webportal other stakeholder are involved in the use of the platform:

- renting operators (boats, cars, bikes, scooters) which are networked by the platform with the possibility to increase visibility to their commercial offer
- commercial operators (i.e. discos, restaurants, shops, etc.) which can develop marketing strategies being indicated in the platform as main points of the departure/arrival of “shared trips”
- third-party developers accessing to Open Data Layer for develop new applications
- Public Administration, consultancy companies and professionals accessing survey/data make available by the Mobility Observatory.

4.3 Unique Value Proposition (UVP)

The existing alternatives to the Shared Use Mobility Agency actually cover specific segments of the demand (e.g. home-school systematic shifts) or niches (door to door movements) identifiable in:

- **Use of public transport.** As indicated above, it is unlikely that the use of LPT will increase its current share of penetration among citizens. Therefore the “shared steps” are targeted to those customers who either for necessity (unsatisfactory lines’ route and frequency) or opportunities (random displacements) do not use public transport. Real experiences of modal shift have shown that in order to achieve a minimum “5%” shift significant investments are required in LPT. However, in Elba island, as already pointed out, the problem open to the LPT concerns the percentage of LPT service uses (which could in any case be redefined in the planning phase);
- **Individual use of the taxi.** This is a non-competitive alternative given its high cost and the fact that it is not able to meet the target mobility demand of the Agency;
- **Own car use.** This is the most currently used alternative. In the summer months it contributes to create problems of congestion of the road network, with long queues and consequent long travel times, as well as causing parking difficulties in the areas of interest (in addition to the related cost). In the winter months, the car is still the preferred means given the spatial and time coverage of the LPT service.

In addition to contributing strongly to the reduction of private vehicles use on the island (with a consequent reduction of the network congestion in the summer) and in addition to answering to different travel needs (e.g. need to move at night and from non-served areas currently not covered by LPT), the UVP of the “shared trips” is the significant economic savings it leads to for its users. To quote a few examples, it offers the possibility to avoid bringing the car on

The Agency contributes strongly to the reduction of private vehicles use on the island

the ferry, the possibility to share a ride (or the taxi expenses) with other people going to the same place, the possibility to avoid the need of a single taxi from/ to discos, etc.

The Agency is therefore the technical/organizational structure that will manage the shared mobility schemes or “shared trips” (ride sharing).

The Agency’s basic element is the technological platform that allows the “dialogue”, through an APP and / or WEB channel, between potential users/ clients in order to put them in contact with each other to share a ride or a taxi ride in different situations / locations (on the ferry, at the campsite, on the beach, at points of interest, in the taxi area, etc.).

4.4 Solutions and advantages

The concept/approach of the Shared Use Mobility Agency currently does not have any “competitors”. Its visibility towards potential users will be guaranteed through the use of the related APP and/or Web Portal. Actually, the concept is close (although not identical) to the approach of TNC companies (UBER, LIFT, OLA, etc.); even if it is very debated and sometimes financed at European level it does not have real applications in Europe. The most similar solution for the context analysis and for the mobility schemes is represented by the DRT (Demand Responsive Transport) services which in any case are part of the LPT service.

In fact, the Agency is “an aggregator of the mobility demand” which does not find an answer in the offer of collective transport services, both for the timetables and for the destinations. The Agency tries to optimise the use of the private vehicles through the shared trip and/or to aggregate the users for the request/use of the taxi (shared taxi).

In order to enhance its services, the Agency, in addition to managing shared mobility through a “shared trips” virtual message board, presents other components that must be taken into account by the Business Model:

- The management component of the ELBA mobility observatory, understood as a possible service to the Municipalities (e.g. management of mobility manager questionnaires for mobility surveys);
- The management component of infomobility services (also realized by the platform and based on APP and WEB);
- The component of “Open Data Layer” for the acquisition and provision of data and information on mobility and transport (including traffic) for the following studies, analysis, etc.;
- The networking component of the rental or parking operators (e.g. the individual charterer can feed the platform with information about its location, the bike park, costs, and update, for example, the daily availability of bikes with data that will be published on APP or WEB in the usual ways).

Each of these components together with the shared mobility one can be examined in terms of potential services and user / customer segments.

4.5 Unfair Advantage

The realisation of the Agency and of its technological Platform, able to offer services through the module “shared trips” message board, requires a vast

SUMA as aggregator of the mobility demand

financial commitment not easily sustainable by a single subject in a de-structured market context in comparison with the common product or service (the trip is a product that is consumed while being produced). The financial contribution of the CIVITAS DESTINATIONS project allows the economic sustainability of the Elba Shared Mobility platform, without considering the support that it provides to the starting phase and promotion of the Agency.

4.6 Costs details

In the following, a first hypothesis (which could vary significantly after the definition of the economic business model) of the annual operating costs estimated after 2020 is reported.

- Staff for operation and small software maintenance

n. 2 persons x 30.000 €/year	60.000	€/year
Offices rent (600 €/month)	7.200	€/year
Platform and technologies maintenance	12.000	€/year
Various expenses	7.000	€/year
Promotional Campaigns	8.000	€/year

Total 94.200¹ €/year

4.7 Revenues

In the period during which the CIVITAS DESTINATIONS project will be active (until August 2020) the funds of the project, beside covering the costs for the technological platform development, partially cover also the operational management of the Agency.

The minimum economic estimate for operational management after 2020 amounts to around € 60-70,000 / year.

The economic sustainability of the platform, after the end of the CIVITAS DESTINATIONS project, could be guaranteed by the external revenues deriving from these initial hypothesis:

- an annual fee (to be established on the basis of the performance of the first 2 years of activity), to be requested at the time of registration to users (both users and commercial activities/operators);
- an annual contribution from renting operators (bikes, cars, scooters, boats, etc.) that are included in the network through the platform (with the possibility of dynamic interaction);
- a contribution from interested commercial operators (e.g. discos, restaurants, supermarkets, etc.) to be indicated in the platform as main points of departure or arrival of "shared trips", in order to increase their attractiveness and safety level;

¹ Subject to possible future variations



- d) possible contributions from local administrations or consultancy companies interested in the documentation and data on mobility and transport accessible through the appropriate “Open Data Layer” of the technological platform;
- e) services / studies realised by the Agency of mobility and transport, over the time (such as collecting and analysing traffic conditions, advertising on the portal, etc.);
- f) management, in the future, of shared mobility services as part of the LPT service contract.

For point a) if we consider that the current tourist flow is about 450,000 units, and assuming that 5% of these are registered, equal to about 22,000 people, a minimum contribution of € 3 per registration could be reasonable, for a total of about 60,000 € / year.

Additional income for around € 10,000 / year could be obtained at least from points b) and c).

These estimates, and the relative amounts, can still be confirmed (or not) after the first 2 years.

4.8 Promotion Channels

Maximum prominence and dissemination to the Agency through local, regional and national press, through local televisions and radios, through the Elba Sharing site and Social Media in general, but also with specific local dissemination campaigns, with distribution of material information on the island and on ferries and events in Elba should be given.

It should be noted that the platform can be used through the APP and web channel and therefore the promotion strategies can be similar to successful promotional campaigns of other APPs.

4.9 Key metrics

The following key metrics have been defined: N. of registered users, N. of active users, N. of commercial activities willing to pay (e.g. rental operators, commercial operators, leisure), N. of informational contacts, N. of end users active installation, N. of web contacts, etc.

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