



ADVANCED LOGISTICS  
PLATFORM WITH  
ROAD PRICING AND  
ACCESS CRITERIA TO  
IMPROVE URBAN  
ENVIRONMENT AND  
MOBILITY OF GOODS



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# LIFE ASPIRE PROJECT

ADVANCED LOGISTICS PLATFORM WITH ROAD PRICING  
AND ACCESS CRITERIA TO IMPROVE  
URBAN ENVIRONMENT AND MOBILITY OF GOODS

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## Deliverable D.2.1

### LIFE ASPIRE - Replicability and transferability strategy Plan

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Contributing author(s)	Stefan Guerra, Giulia Pacini, Antonio Liberato, Pamela Salvatore
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## **1. INTRODUCTION**

### **1.1 Background and aim of LIFE ASPIRE Project**

The main objective of LIFE ASPIRE project is to develop an innovative “credit-based” management policy for freight traffic in urban area, to implement new city logistics services and promote sustainable and smart management of urban environment. Moreover, the project aims to raise awareness on sustainable and energy efficient urban logistics needs proposing smart solutions for other European Historic Towns.

LIFE ASPIRE aims to achieve real improvements of air quality in the urban area of Lucca by demonstrating new city logistics policies, services and enforcement measures that will lead to a significant reduction of traffic congestion and emissions due to freight vehicles in city centre. Demonstration activities of the project were implemented in the Lucca historic city centre aiming at assessing the proposed approach in the real-life context of urban freight distribution of the city.

The project defined and implemented a “credit based” access policy related to last mile goods delivery. As operational instrument to manage this innovative policy, LIFE ASPIRE Project implements in Lucca a Logistics Credit Management Platform (LOCMAP). LOCMAP also manages two new innovative logistics services (Load/Unload Parking Lots and Cargo-bike Sharing) and integrates the existing access control system, by RFID UHF technology. The main innovation of the Project is the implementation of a policy which awards most sustainable transport operators on the basis of different factors (e.g. vehicle emissions and dimension, behaviours in performing last mile delivery, etc.).

The demonstration activities in Lucca were complemented by the replicability and transferability analysis of the implemented measures and services to the city of Zadar (Croatia) and Stockholm (Sweden), taking into account the peculiarity of their different contexts. The identified solutions can be, in fact, widely transferred and applied to other urban contexts with similar characteristics and problems.

### **1.2 Action D.2 “LIFE ASPIRE Replicability and transferability strategy Plan”**

The successful replicability and transferability of the LIFE ASPIRE project requires a specific strategy, including actions to multiply the positive impacts of the demonstrated measures/services and to address and influence a wide critical mass, thus assuring a significant uptake of the solution

demonstrated and their replicability and transferability beyond project lifetime. Therefore, a proper strategy addressing not only "what" to transfer but also "how" to do this, was developed for the benefit of all other European towns that would evaluate how to implement the LIFE ASPIRE approach. Action D2 was devoted to identify some key principles, also on the basis of the experience done during the project implementation by the partnering city of Zadar and Stockholm, in order to develop the LIFE ASPIRE Replicability and transferability strategy Plan.

Such a plan allows the replication and transfer of the implemented solution to other sectors, regions or countries. In other words, beyond the promotion activities developed under Action D.1, taking also in consideration the experiences achieved in the sites of Zadar and Stockholm, the project defined a specific strategy to promote replicability and transferability towards other EU cities, also after the project conclusion.

### **1.3 Scope of the Deliverable D.2.1**

The present deliverable D2.1 "Replicability and transferability strategy Plan", consists in a set of guidelines that allows to identify the appropriate measure or service, among those demonstrated in the LIFE ASPIRE project, evaluated by the partnering cities Zadar and Stockholm, that can be transferred to other European cities. It is worth to note that the deliverable D2.1 reports also activities performed during the project duration devoted to the commitment of the involved Municipalities, to exploit every appropriate public/institutional occasion (i.e. visits by journalists, political/technical visits, experience exchanges with other Municipalities, etc.) to promote the demonstrated and transferred project approaches, going further than simply committing to project continuation.

The Plan adopted a specific methodology consisting in 7 different steps (tuned and tested on the specific cases of Zadar and Stockholm) including:

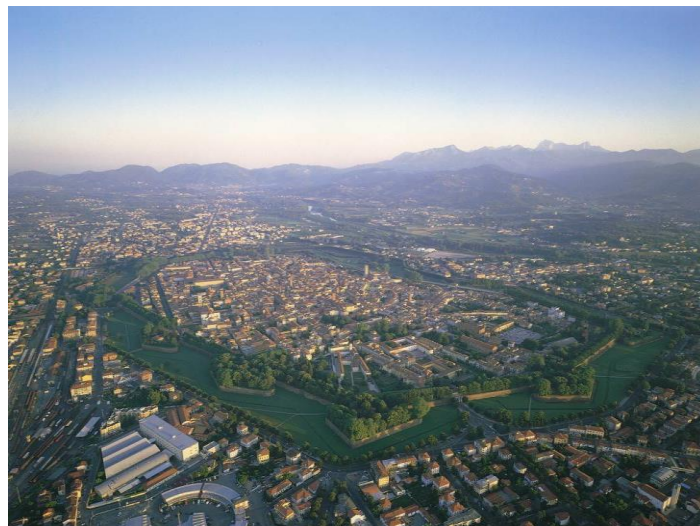
1. Evaluation of the existing situation and problems to be solved in the target city
2. Identification of common characteristics between the target and the origin sites
3. Ranking of the goals that the target city should achieve
4. Identification of specific measures with potential for transfer
5. Ex-ante assessment of measures to transfer
6. Identification of need for adjustment/personalisation
7. Roadmap for replicability and transferability implementation

## 2. LIFE ASPIRE DEMONSTRATED MEASURES/SERVICES

### 2.1 Lucca demonstration site

Lucca represents a typical European town of small-mid sized dimensions, with issues related to city logistics, common in many towns: air quality impacts – PM<sub>10</sub>, NO<sub>x</sub>, “secondary pollutants”, CO<sub>2</sub> emissions, noise, energy consumption, etc. As well known, these aspects have serious negative effects on health and well-being of the population, in particular on the most vulnerable citizens (i.e. children, elderly people).

In Lucca, as in many other European towns, the environmental and traffic problems related to commercial fleet are emphasized in the historic area, characterized by a network with a dense grid of narrow streets and by additional constraints resulting from the presence of old and historical buildings, monuments, relevant pedestrian flows of tourists and visitors, etc.



*Figure 1 Lucca aerial view*

These conditions are also present, in different context and dimension, in the historic centres of the cities of Stockholm (SE) and Zadar (HR) where the potential of transferability of the LIFE ASPIRE approach has been analysed.

LIFE ASPIRE project aims to implement a "credit based" policy rewarding transport operators on the basis of different factors/behaviours (e.g. vehicle emissions and dimension, duration of the stay inside the Restricted Traffic Zone (RTZ), trips frequency, time windows, use of new logistics services, etc.). In fact, the awarding scheme demonstrated in the project foresees the assignment

to each RTZ accesses permit a specific number of ecopoints, which partly depend on unchangeable aspects of the vehicle (namely "static parameters"), partly on behavioural aspects (namely "dynamic parameters"). In the first case, the power train and the emission standard of the vehicle, as in the vehicle registration card and the use of a consolidation facility close to the historic centre are considered.

Concerning the dynamic parameters, a dedicated platform (LOCMAP) was developed in order to collect data coming from the technological systems installed in the demo site of Lucca (RFID gates, Loading/Unloading bays sensors, cargo- bike sharing stations) and to manage the ecopoints acquired by the users. The aim of the credit based policy and of the related supporting technologies, is to foster transport operator to use "clean" vehicle and to adopt virtuous behaviours in performing last mile delivery operation in the RTZ, avoiding the use of enforcement measures.

LIFE ASPIRE technological systems demonstrated in Lucca are reported in the following list and detailed in the sections below:

- Restricted Traffic Zone access/exit monitoring by UHF RFID technology
- Smart Loading /Unloading bays
- Cargo bike sharing service
- Logistics Credit Management Platform – LOCMAP
- Ranking and Awarding scheme

It is relevant to report that LIFE ASPIRE project activities in the Lucca demonstration site are developed according to the local policy planning aiming, in the last years, to contribute to environmental sustainability of mobility processes of the City. The relation between the LIFE ASPIRE project and local governance is not an occasional result of project activity but levers on the fact that LIFE ASPIRE approach, since the drafting of the project proposal, was identified as an operational tool of the City Administration to implement actions aimed at making the mobility processes more sustainable inside the historic centre (General Plan of the Urban Traffic, Municipal Council Resolution n.10 16.02.2017 and Sustainable Urban Mobility Plan - SUMP). Moreover city logistics optimization is addressed also in the Sustainable Urban logistics plan (Lucca SULP 2014, developed in the frame of the ENCLOSE Project 2012-2014 (IEE/11/826/SI2.615930). Recently, LIFE ASPIRE's rewarding approach prompted the definition of the regulation for accessing RTZ, recently approved, embracing the "polluters pays" EU principle (PAMS, Operative Urban Plan on parking and circulation, City Board deliberation 16/2021). In order to reach these results, several offices of the Administration of Lucca were involved, together with the other partners, in the

development of project activities in order to assure the full compliance of the project actions with the goals of the Administration.



## 2.2 Restricted Traffic Zone access/exit monitoring by UHF RFID technology

The City of Lucca adopted a specific measure for monitoring the access/exit of commercial vehicles to the RTZ using RFID technology composed by peripheral control units (UHF antennas) locate and the entry/exits point of the RTZ. Electronic identification of vehicles is performed by using the RFID tag that were distributed to transport operators having a permit to access the RTZ (round 2600 units).



*Figure 2 RFID system installed at the RTZ border in Lucca*

Therefore accesses and exits of transport operators were monitored and data concerning time of entrance /exits, time spent inside the RTZ were store in LOCMAP in order to feed the awarding scheme described in section 2.6.

## 2.3 Smart Loading /Unloading bays

The technological system related to the monitoring of load/unload bays is composed by ground-installed parking sensors in the bays reserved for loading/unloading activities.

The sensors network is able to detect vehicle presence and thanks to a wireless technology (LoRaWAN) is able to communicate with LOCMAP platform.



*Figure 3 Sensored Loading/Undloading bays installed Lucca*

During demonstration, data concerning the implemented 34 Load/Unload dedicated parking lots, were recorded, stored and analysed according to several parameters. In particular, for every equipped parking lot, occupancy status (with date/time parameters) is recorded, also allowing operators to verify their status by the specific LIFE ASPIRE Mobile App.

## **2.4 Cargo bike sharing service**

The cargo bike sharing system installed in Lucca consists of 3 stations with 3 cargo bikes each for a total of 9 vehicles dedicated to transport operators. The cargo-bike is a transport tricycle with a front box with a volume 300 litres, equipped with a closure (lid) electrically lockable, activated by the App. The stations are located in the selected location outside the RTZ easily accessible for transport operators. The cargo bikes are of different types: n. 6 standard bikes and n. 3 pedal assist, recharged through a special battery charger system integrated into the coupling structure to which the cargo bikes are attached.



*Figure 4 Cargobike sharing stations installed in Lucca*

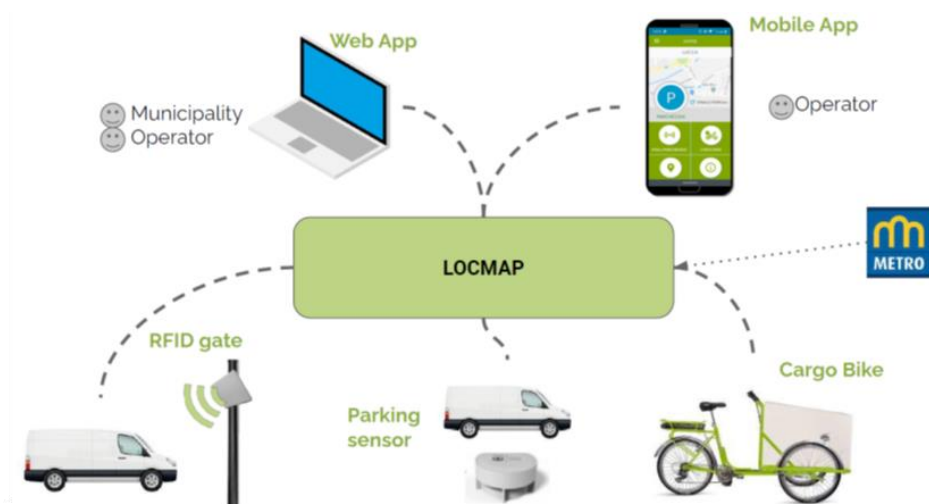
The service is operative 24 hours a day and there is no need for staff to be present at the stations as the locking system allows recharging the electric cargo-bike and / or the GPS battery on standard cargo-bikes.

From the management side the LOCMAP platform and LIFE ASPIRE App allow to know in real-time cargo-bikes availability in each station and related diagnostics as well as cargo-bikes use statistics, such as time of use through pick-up and return stations registration.

During demonstration LOCMAP Platform functionalities, allowed to record, store and analyse data according to several parameters. In particular, for every bike, parking lots occupancy status and date/time of unlock/lock (and related time of use) is recorded, also allowing operators to verify the status by the specific LIFE ASPIRE Mobile App.

## 2.5 Logistics Credit Management Platform – LOCMAP

The Logistics Credit Management Platform (LOCMAP) represents the essential tool supporting the “credit based” rewarding policy foreseen by the LIFE ASPIRE project and is the integrated management and control platform governing all the LIFE ASPIRE technologies deployed. LOCMAP is a multi-tier software application with a mobile front-end App for the logistics operator and a separate back-office for the City Administration allowing to have a complete statistical view on collected data in compliance with the European GDPR.



*Figure 5 LOCMAP structure*

LOCMAP manages the Loading/Unloading Bays and Cargo-bike Sharing system and integrates data coming from the RFID access control system, to monitor commercial vehicles entrance/exit in the RTZ.

The access to the different functionalities is provided through two different back-end solutions:

- the mobile back-end, aimed to the transport operators. The Mobile App is dedicated to transport operators and allows registration, check in a load/unload parking lot and use of cargo bikes.
- the desktop back-end, available according to different access rules for the city administration. The functionalities provided to the city administration represents the core part of LOCMAP, providing relevant information concerning the ranking of transport operators according to sustainability principle.

The demonstration allowed to exploit the effective integrations between the LOCMAP platform and the various hardware modules of the project, to test massively its results and to adjust progressively its functionalities. The demonstration allowed to extensively use the LOCMAP functionalities leading to a better understanding of the elements of the rewarding scheme and to adjust different parameters in order to properly calculate the ranking of transport operators and KPI value related to the impact assessment activity.

## **2.6 Ranking and Awarding scheme**

Overall, the LIFE ASPIRE project aims at demonstrating an innovative, flexible and differentiated Credit based regulation for last mile goods delivery. A specific number of ecopoints are assigned to each vehicle accessing the RTZ. As introduced above, the assigned Ecopoints depend, in part, on the characteristics of the vehicle (i.e., the "static parameters"), in part on behavioural factors concerning the way the vehicle operates inside the RTZ ("dynamic parameters").

The LOCMAP platform allowed to collect and integrate all the data concerning the credit system and related ecopoints assigned. LOCMAP reports an overall ranking of Ecopoints attributed to each vehicle as well as a specific section related to KPIs, including the Ecopoints Annual Ranking Report.

Such ranking represents a relevant content for the project because on the basis of these values the aspects of sustainability can be analysed (according to the Deliberation of the City Board of Lucca, n. 242 of October, 29 2019 about "LIFE ASPIRE project - implementation measures for the experimental phase of the project and modification of the loading and unloading areas of the historic centre"). LOCMAP ranking provides therefore a metric to build up a reward scheme

applicable to individual users, and at the end of the project, the most sustainable operators was awarded.

**The rewarding approach encouraging the transformation toward more sustainable city logistics is the big outcome of LIFE ASPIRE and its most relevant legacy:**

- Requires the involvement of the targeted operators and stakeholders
- Requires appropriate and effective communication campaigns
- Can improve the ecological transition of the cities more than enforcement schemes

### 3. LIFE ASPIRE PROJECT ACTIVITIES FOR THE REPLICABILITY AND TRANSFERABILITY

#### 3.1 The role of the Cities of Stockholm and Zadar

The demonstration activities in Lucca has been shared with the cities partner of the project, Stockholm (Sweden) and Zadar (Croatia) taking into account the peculiarity of their different contexts. The two cities share with Lucca the need to promote a mobility that is more respectful of people and environment, to the benefit of tourism and commercial activities development in the historic centres. The partnering city of Zadar and Stockholm performed a Replicability and Transferability analysis (see action B4 and related deliverable B4.1 "Replicability and Transferability analysis in Zadar Report" and B4.2 "Replicability and Transferability analysis in Stockholm Report")



*Figure 6 Replicability and transferability from Lucca to Stockholm and Zadar*

Here we reported the main results of the analysis performed in action B4 highlighting those information that are relevant for the definition of a general guideline to support a wide replicability and transferability of LIFE ASPIRE solutions, measures and eco-sustainable city logistics services to other small/mid-size urban areas of dimension comparable with Lucca but in different context ("Peninsula" historic area in Zadar - HR), and also to evaluate the potential scalability to large metropolitan area ("Gamla Stan" historic centre in Stockholm - SE).



### 3.1.1 Replicability and Transferability analysis in Zadar

The context analysis highlighted that in Zadar the delivery process from the origin to the destination is conditioned by several of factors, but the last mile logistics resulted to be the one more affecting the efficiency of the process. Aiming at reducing traffic congestions and at optimizing delivery to the Peninsula, the City highlighted the need to implement a set of measures that shall adapt the delivery process to end users (mainly retailers), as well as to local residents, and visitors of the Peninsula. The reduction of delivery time is one of the issues for which spatial planners plan to focus in order to find appropriate solutions.

The LIFE ASPIRE project allowed to evaluate the implementation of measures to enable a more efficient logistics process in the centre of the City of Zadar – Peninsula. Following the example of the city of Lucca, a series of measures can be evaluated in Zadar:

- **Development of video surveillance software** that will count vehicles that have entered the pedestrian zone.
- **Installation of RFID antennas** for tracking vehicles in the pedestrian zone (to make it easier to find out how long they stay and how much everything affects residents and the environment).
- **Setting up of lifting poles** at all entrances to the pedestrian zone.
- **Introduce new regulatory measures** to have a better and more comprehensive strategy for the management of delivery vehicles in the pedestrian zone of the Peninsula.



*Figure 7 Zadar peninsula*

### 3.1.2 Replicability and Transferability analysis in Stockholm

On the basis of LIFE ASPIRE measure and services demonstrated in Lucca, the City of Stockholm developed an analysis for their adaptation, replicability and transferability, since the context is quite different.



*Figure 8 Stockholm old city centre*

Main results achieved so far highlighted already a positive effect on the living environment in Old town and the City is planning for continued implementation of the following measures:

- **Last mile solution for zero emission deliveries and waste collection in the Old town:** creation of a micro-terminal or a hub where deliveries to the terminal can be carried out at night-time, outside of the Old town and close to the major road network. The micro-terminal is the measure that involves the most stakeholders and other parties outside of the city's own organisation.
- **Cargo bike sharing systems for residents and commercial owners in the Old town:** the system will provide about 150 cargo bikes and will be in place in spring 2022. The cargo bike sharing system is open to all people visiting and living in Stockholm, but within the Life Aspire project, the city also see it as an alternative for last mile transport within the city limits, to be used also by carriers. The parking space for the bikes will be virtual, regulated by a geofencing system. In Old town the space will be located in proximity to the surrounding main roads, enabling easy transfer of goods between cargo bikes and trucks as it correlates with parking space for cars. As the parking area is



geofenced, and not upheld by physical barriers, it is also easy and cost efficient to regulate and change as the level of usage increases or changes.

- **Traffic monitoring**, increase adherence of the regulations in the Old town through access control system in cooperation with the police. The measure concerning a new system for traffic monitoring is the one that has gotten the furthest, within the time frame of the Life Aspire project and the measures would also have to be evaluated together with the police in order to consider a scale-up and used throughout Stockholm, even on other local traffic regulations than entrance to the Old City, and would help the city of Stockholm receiving better compliance with regulations in general.

### 3.2 The role of the CSSF in the transferability

A strong effort was devoted along all the project duration in order to establish a group of stakeholders which showed their interest even in the first phase of the project in order to have continuous feedback concerning several aspects, of the demonstration activities allowing to improve the effectiveness of the services offered and of the awarding programme.

In particular, among the other project activities, LIFE ASPIRE project consortium set up the **Cities and Stakeholder Supporting Forum – CSSF** involving other European cities (mostly small and medium sized but also some metropolitan ones), as well as research centres and universities (mostly dealing with transport and mobility issues), environmental associations, agencies and associations for innovation and sustainable mobility all over Europe. The members were involved through various activities, such as: direct meetings, receiving periodical newsletters (10 issues), invitation to attend the LIFE ASPIRE workshops in Lucca, Stockholm and Zadar, open access to the project deliverables. In addition, they were invited to participate to the International Final Conference held by the coordinating beneficiary.

As an example, the work done with the CSSF led to the assessment of the LIFE ASPIRE measure and services by the Slovakian Ministry and Regional Government during the participation to the LIFE POPULAIR conference (on the last 7th September 2021): common problem related to air quality and the urgency of finding innovative solutions to address this issue were the link to connect the two experiences. Such a shared view on air quality led to a collaboration which produced a submission to the last LIFE 2021 call with the involvement of Slovakian stakeholder. Considering the importance and peculiarity of CSSF the Consortium agreed to maintain the forum active until the end of the project. The involvement of other local authorities and stakeholders is

considered in fact a key factor for the success of the project and the beneficiaries continued working to involve other cities until the end of the project.

Overall, the work done during the project duration allowed to promote the commitment of the involved Municipalities and to exploit every appropriate public/institutional occasion (i.e. visits by journalists, political/technical visits, experience exchanges with other Municipalities, etc.) to spread the demonstrated and transferred project approaches, going further than simply committing to project continuation, but paving the way for future transferability of the project approach.

## 4. TRANSFERABILITY METHODOLOGY FOR LIFE ASPIRE

### MEASURES/SERVICES

In general and according to the Transport Innovation Deployment for Europe, “Transferability” is a process of verifying the chances of a successful implementation of a measure in a city (origin site) to another adopting city (target site) at an operational or implementation level. The use of a transferability methodology provides an opportunity to learn from a previous experience of implementation, to better exploit opportunities and to avoid repeating mistakes. Even though a successful implementation of a measure, a policy, a service, etc. in a city provides grounds for transferring the measure to other cities, the right conditions are needed to make it a reality. The replication of success in a different urban context is challenging as the cities can differ in many aspects of transport and traffic conditions (demand, supply, infrastructure, traffic control and management, etc.), geographical, environmental, demographic, socio-economic and cultural backgrounds as well as institutional and legal frameworks.

#### 4.1 Key guiding principles in transferability

The following key guiding principles have been identified for transferability in general, according to findings of European projects (e.g. SIUTS <https://cordis.europa.eu/project/id/690650>):

- A) **Transferability of a policy/measure depends to some extent on compatibility of institutional context.** This implies attention on how a policy instrument may fit with the context of the target city, while the identification of comparable cities may assist assessment of potential transferability.
- B) **Different components of transferability may be identified in terms of policy instruments transfer between cities.**
  - a. Scale of application of a policy (is it a local measure or a nation-wide measure?)
  - b. Degree of transfer (to what extent it will be transferred e.g. within a city, between cities, between different country context, etc.)
  - c. Horizontal translation of a policy, where a policy is transferred from one city to another, without changing the scale of application
  - d. Vertical transfer or “scaling up” or “scaling down” a policy (from local application to a wider context)
- C) **Acceptability is crucial**, as supportive measures of mobility are easily transferred unlike measures perceived as restrictive.

Concerning transferability, since the main objective of LIFE ASPIRE project is to contributing to the sustainability of the urban environment, focusing on new city logistics services and management policy, it is important to highlight the European guidelines in such context.

In fact it is the worth to note that the European Commission developed some guide lines related to the development of Sustainable Urban Mobility Plan (SUMP), designed to satisfy the mobility needs of people and businesses in cities and their surroundings for a better quality of life. It should be built on existing planning practices and should take due consideration of integration, participation, and evaluation principles. City logistics processes need to be taken into account and properly addressed with specific Sustainable Urban Logistics Plan (SULP, EC guidelines 2019, [https://www.eltis.org/sites/default/files/sustainable\\_urban\\_logistics\\_planning.pdf](https://www.eltis.org/sites/default/files/sustainable_urban_logistics_planning.pdf)).

Moreover, in order to support the transition to cleaner, greener, and smarter mobility, in line with the objectives of the European Green Deal ([https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal\\_en](https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en)), the Commission recently adopted a new initiative – part of the wider “Efficient and Green Mobility Package” released on the last December 2021– aiming to make urban mobility more sustainable, smart, and healthy (<https://www.eltis.org/in-brief/news/european-commission-releases-new-urban-mobility-framework> ).

LIFE ASPIRE actions, aiming at demonstrating new city logistics policies, services and measures leading to a significant improvement of the urban environment, is therefore coherent with the European actions especially supporting the replicability and transferability implementation.

## **4.2 The LIFE ASPIRE transferability methodology**

The LIFE ASPIRE replicability and transferability methodology require a specific strategy, including actions to multiply the positive impacts of the demonstrated measures/services and to address and influence a wide critical mass, thus guaranteeing a significant uptake of the solution proposed/ demonstrated and their replicability and transferability beyond project lifetime.

The transferability depends to some extent on compatibility of institutional context between the sites, especially when it comes to policy measures.

The methodology consist of a set of guidelines based on the 7 steps methodology, tuned and tested on the specific cases of Zadar and Stockholm. LIFE ASPIRE project developed an innovative system by implementing a set of regulatory, organizational, operational and technological measures and all this aspects have to be considered in the following steps:

STEP 1: Evaluation of the existing situation and problems to be solved in the target city

STEP 2: Identification of common characteristics between the target and the origin sites.

STEP 3: Ranking of the goals that the target city should achieve by the transfer of the pilot services.

STEP 4: Identification of specific measures with potential for transfer

STEP 5: Ex-ante assessment of measures to transfer

STEP 6: Identification of need for adjustment/personalisation

STEP 7: Roadmap for replicability and transferability implementation

#### **4.2.1 STEP 1: Evaluation of the existing situation and problems to be solved in the target city**

In this step, the analysis of the current practices and policies regarding the specific topic in the target cities is presented, in order to identify the main issues that the transferability study should address.

The activities consisted in the collection of existing data/information available from departments and from other entities (i.e. chamber of commerce, associations, etc.), with a specific desktop activity.

The annexed tables provide example of data/information to be collected and the possible sources. The annex is to be considered as a first indication for the definition of the preliminary baseline. Of course, the table for data collection can be revised and adapted in order to achieve a useful definition of the preliminary baseline. After the definition of the preliminary baseline the city can evaluate the usefulness/need to perform, some additional surveys (i.e. vehicles counting, interviews) to collect updated or missing data, to be used for the completion of the baseline. Eventually the extension of the collection of data/information at whole city level or, in case of bigger cities, to other relevant areas/districts can be evaluated.

#### **4.2.2 STEP 2: Identification of common characteristics between the target and the origin sites.**

In order to assess if the demonstrated measures/services are transferable, the origin site and the target sites should be comparable. The comparability is proved by identifying common characteristics and common problems.

In order to identify common characteristics of the two sites an analysis of the needs the target city wants to cover through the LIFE ASPIRE measure and services allows to highlight which are common elements between the sites.

The activities consists in the clarification of the target city needs as compared with the need of the origin site in order to understand which service is useful to be adopted or needed to be optimized/improved. For the above mentioned evaluation, the city should first identify its real needs in order to understand and select which services are the most suitable for its case.

To this purpose a list of questions can be useful to guide the analysis. The questions are all based on the needs each service covers and have to be answered by a stakeholders' group.

In order to collect also data related to the ranking of the needs (see also STEP 3), an assessment can be carried out between the stakeholders of the target city using appropriate metric:

- strong need for data collection and analysis
- low need
- no need
- low need but already is being collected by other sources
- strong need but already is being collected by other sources

Needs the target city wants to cover through the LIFE ASPIRE measure and services		Need to be covered
<b>1</b>	Is there a need for data collection regarding Origin–Destination trips?	
<b>2</b>	Is there a need for data collection regarding travel times and travel distances?	
<b>3</b>	Is there a need for data collection regarding the trip purpose?	
<b>4</b>	Is there need for data collection regarding the selection of transport mode and the reason for choosing the specific transport mode?	
<b>5</b>	Is there need for real time data collection?	
<b>6</b>	Is there need for estimation of indicative performance indicators?	
<b>7</b>	Is there need for data collection regarding the SUMP development	
<b>8</b>	Is there need for better understanding of the city's mobility requirements?	
<b>9</b>	Is there need for re-scheduling transport services according to users' requirements?	
<b>10</b>	Is there need for planning and implementing effective mobility interventions in the city?	
<b>11</b>	Is there a need for ex-ante assessment of the proposed interventions?	

#### **4.2.3 STEP 3: Ranking of the goals that the target city should achieve by the transfer of the pilot services.**

The appropriate logistics measures that are going to be selected for adaptation must serve specific goals and needs of target cities. These goals must be identified by data analysis and interviews with authorities, stakeholder and end users.

The analysis performed in the previous steps highlights also the relative level of importance (high, medium, low) of each service judged from the target city's point of view. As the advice from experts in urban mobility field is a valuable aspects to be considered, the targeted city has to define an appropriate stakeholders' group working together with representatives from the origin cities in order to understand which service are the most useful to be adopted or need to be optimized/improved. The level of importance should be supported by the relevant comments.

The cooperation of the relevant Authorities/Stakeholders in the targeted city as well as between the target city and the origin city, is primarily a decision that should be taken at political level and engage authorities directly or indirectly involved in urban and regional mobility.

An example of the authorities and stakeholders that should be engaged for achieving the scope of transferability are the following:

- Municipal departments relevant to mobility processes
- Transport operators and authorities
- Hotel associations
- Academic or research organizations
- SMEs related to urban mobility
- Chambers, trade unions etc.
- Citizens associations
- Media

It should be highlighted that the knowledge transfer itself is an action that requires the participation of the private sector. Both large enterprises and SMEs on mobility, data management, ITS etc. should be convinced for the necessity of this initiative and allocate efforts to adopt the proposed services. Therefore, the above authorities should work together with the private sector in order to ensure successful knowledge and technology transfer, and most importantly adoption by all parties involved in urban mobility sector.



The Engagement of relevant stakeholders group will lead to the definition of ranking of the goals that the target city should achieve by the transfer of the pilot services.

#### 4.2.4 STEP 4 Identification of specific measures with potential for transfer

In the first phase, an analysis of the measures/services that are implemented in the origin site will be implemented using specific indicators such as operational viability, cost effectiveness and other physical, organizational and functional indexes. The output of this analysis will be the level of capability of target sites to adapt these practices.

As an example, we reported the measure and services identified by the partnering cities of Zadar and Stockholm for the potential transferability as referred to the measures and services demonstrated in the origin site of Lucca.

<b>City of Lucca: measure and services demonstrated</b>	<b>City of Stockholm</b>	<b>City of Zadar</b>
<b>Smart Loading /Unloading bays</b>	<b>Last mile solution for zero emission deliveries and waste collection in the Old town</b> (creation of a micro-terminal or a hub)	
<b>Vehicle monitoring by UHF RFID technology</b>	<b>Traffic monitoring</b> in the Old town through access control system	<b>Development of video surveillance software</b> for vehicles that entering the pedestrian zone <b>Setting up of lifting poles</b> at all entrances to the pedestrian zone.
<b>Cargo bike sharing service</b>	<b>Sharing systems for residents and commercial owners in the Old town.</b>	<b>Installation of RFID antennas</b> for tracking vehicles in the pedestrian zone (to make it easier to find out how long they stay and how much everything affects residents and the environment).
<b>Ranking and Awarding scheme</b>		<b>Introduce new regulatory measures</b> for a comprehensive strategy for the management freight vehicle traffic

Please see the deliverable B4.1 and B4.2 for a detailed evaluation of the specific measures.

#### 4.2.5 STEP 5: Ex-ante assessment of measures to transfer

The target cities need to assess if the measures/services that will be transferred to them are going to achieve the goals that were ranked as first priority in the above mentioned Step 3.

In order to assess the potential to transfer the selected measures and services a short list of useful points is reported in order to ease the ex ante assessment:

<b>Aspect to be evaluated</b>	<i>Open questions</i>
<b>Relevance</b>	<i>To what extent is the adoption of selected measures relevant in relation to local needs and priorities?</i>
<b>Efficiency</b>	<i>How easily will the resources turn into outputs or results?</i>
<b>Effectiveness</b>	<i>To what extent will the transferred measures help the target city to achieve the specific goal and solve specific problems?</i>
<b>Utility</b>	<i>Will the proposed measures/services have an impact on the target groups in relation to their needs?</i>
<b>Sustainability</b>	<i>To what extent will the benefits last after the implementation of the measures?</i>

#### 4.2.6 STEP 6: Identification of need for adjustment/personalisation

In many cases, the adaptation of specific measures is followed by specific adjustments/personalisation. These usually concern legal issues, institutional aspects or policies that must be reformed or change in order to become applicable to the target city. Indeed, each measure/service should be assessed on a case-by-case basis, to ensure it is effective, acceptable and embedded in a holistic urban environmental. The social, environmental and economic impact and consequences of each measure/service needs to be carefully evaluated before confirming its suitability.

#### **4.2.7 STEP 7: Roadmap for the replicability and transferability implementation**

Eventually, a specific roadmap for the replicability and transferability implementation of the proposed measures/services shall be developed in order to ease the transfer to the target city at full operational level. The roadmap for replicability and transferability implementation is a planning act at Municipal level as it concerns the implementation of the selected measures and services. Having the measures positively passed the quality and congruity check defined in the previous steps, the roadmap should identify a pathway in order to introduce such measure and service in the local governance with the official approval by Local Authorities.

Usually, the approval process for a technology is regulated by national and local laws, which may significantly differ from country to country, characterised by different methods as it clearly depends on the different rules and procedures existing in the EU Countries at local/national level and on the local normative/by-laws context.

Moreover, the roadmap should involve publicity level in order to guarantee the interests of all the citizens and not only those of the directly involved actors. In fact, it is important to stress that a high level of involvement of different actors is necessary: from single operators to Associations, to citizens, Municipal offices and external planning experts. For this reason, it is worth noticing that any kind of discussion forum is useful, from "live" meetings, to virtual and social spaces provided by social networks (i.e. Twitter, Facebook, etc.).

As introduced above, LIFE ASPIRE project activities levers on the fact that the project approach was identified as an operational tool of the administration to contribute to environmental sustainability of mobility processes of the City, since the drafting of the project proposal, to implement actions aimed at making the logistics processes more sustainable inside the historic centre (Sustainable Urban Mobility Plan - SUMP, Municipal Council Resolution n.107 11.12.2018). It is important to highlight this aspect because, with this premise, LIFE ASPIRE project activities were developed according to the local planning instruments and governance: several offices of the Administration of Lucca were involved, together with the other partners, in the development of project activities to assure the full compliance of the project actions with the goals of the Administration.

Moreover, LIFE ASPIRE's rewarding approach has influenced the definition of the regulation for accessing RTZ, recently approved, embracing the "polluters pays" EU principle (PAMS, Operative Urban Plan on parking and circulation, City Board deliberation 16/2021).

Also for the partnering Cities of Stockholm and Zadar, the replicability and transferability analysis resulted more efficient for those measures that were coherent with the local city planning tools (*Traffic Master Plan of the functional region of Northern Dalmatia* for Zadar and *Stockholm Freight plan in the overall Urban Mobility strategy* for Stockholm). In this sense the LIFE ASPIRE project allowed to the Cities to take into consideration several new regulatory, organizational, operational and technological measures among which, some are assessed for their replicability and transferability in their specific context, but the local governance should, in any case, be coherent with the roadmap for replicability and transferability implementation.

## **ANNEXES**

**STEP 1:** example of form to collect data for the evaluation of the existing context in the target city and identification of the problems to be solved.

Section 1 – General information		
Information/Data	Source	How to describe
Extension: - of the Municipality territory - of the target area	Municipality. Web.	
N. of residents: - in the Municipality - in the target area	Municipality demographic offices	If possible consider also last years trend.
N. of tourist visiting: - the city - the target area	Municipality. Tourist Office.	Tourist flows (if possible) at monthly level in order to define the seasonal trends

Section 2 – Municipal mobility plans / regulations		
Information/Data	Source	How to describe
- Presence of Mobility and/or Logistics Plans at overall city level - Specific Mobility and/or Logistics Plans at target area level	Municipality	- Describe the main aspects of the i.e. SUMPs / SULPs (if any). - Other relevant information.
Mobility regulations for access and parking of <b>resident vehicles</b> living in the target area.	Municipality	- Permits typologies and rules. - Exemptions. - Costs. - Other relevant data.
Mobility regulations for access and parking of <b>commercial vehicles</b> in the target area.	Municipality	- Permits typologies and rules detailed for different categories: i.e. transport operators, building construction/maintenance operators, shopkeepers, etc. - Exemptions. - Costs. - Time windows for access - GVM – Gross Vehicle Mass and/or Engine constraints - Other relevant data
Number of <b>permits</b> released	Municipality	Detailed by different operators categories and by typology (daily, weekly, monthly, annual).
Municipal regulation for <b>commercial activities</b> in the target area.	Municipality	i.e. shops opening time, etc.

**Section 3 – Existing ICT systems**

Information/Data	Source	How to describe
- ICT Systems implemented or planned at overall city level.	Municipality	- In particular: Access Control, Video Surveillance, Parking Management, On-road Parking Management, Traffic sensors, , InfoMobility Platform ( Web Portal, APP, ), others.
- ICT Systems implemented or planned in the target area.		

**Section 4 – Existing city logistics infrastructures**

Information/Data	Source	How to describe
Existing/planned UCCs (Urban consolidation center) at overall city level.	Municipality	
Load/Unload parking lots: - at city level - in the target area	Municipality	n. of L/U parking lots (if any), time windows, typology of parking lots control system.
Recharging EV stations	Municipality	Number of installed devices, locations, typology, rules for commercial vehicles.
City Logistics complementary services	Municipality	i.e cargo bikes, pick-up points, others.

**Section 5 – City logistics aspects (freight transport demand)**

Information/Data	Source	Note
Number of Ho.Re.Ca. activities in the target area	Chamber of Commerce. Municipal garbage tax archives. Other Municipal offices. Web.	If possible, detailed by - N. of Hotel - N. of Apartments/B&Bs - N. of restaurants - N. of bars - N. food stores - N. of street market stands (if any)
Seasonality of the activities	As above	Qualitative description of seasonal trends (i.e. indication of the activities still open during the winter, etc.)
Number of others shops inside the Peninsula	Chamber of Commerce. Municipal garbage tax archives. Other Municipal offices.	If possible, detailed by standard commercial categories (i.e. souvenirs, clothing, electronics, etc.).
Number of handicraft enterprises inside the Peninsula	Chamber of Commerce. Category associations	
Offices (public and privates), banks, etc.	Municipality. Web.	

## Section 6 – Last mile delivery processes – Vehicles access data

Information/Data	Source	Note
Number of transport operators with depot/s in the Municipality territory	Chambre de commerce. Municipality. Web.	
Number of commercial vehicles of <b>third party transport operators</b> accessing the target area.	Already existing data, if any (i.e. from Municipality). On-site counting (if necessary, during STEP1).	If possible, detailed by: <ul style="list-style-type: none"> <li>- Access timing (both allowed and not allowed time windows)</li> <li>- With or without access permit</li> <li>- Vehicle category</li> </ul>
Number of commercial vehicles of <b>express couriers</b> accessing the target area	Already existing data, if any (i.e. from Municipality). On-site counting (if necessary, during STEP1).	If possible, detailed by: <ul style="list-style-type: none"> <li>- Access timing (both allowed and not allowed time windows)</li> <li>- With or without access permit</li> <li>- Vehicle category</li> </ul>
Number of commercial vehicles in <b>own-account transport</b> accessing the target area	Already existing data, if any (i.e. Municipality). On-site counting (if necessary, during STEP1).	If possible, detailed by: <ul style="list-style-type: none"> <li>- Access timing (both allowed and not allowed time windows)</li> <li>- With or without access permit</li> <li>- Vehicle category</li> </ul>
Number of commercial vehicles of shopkeepers/fruit market in <b>self-supply operations</b> accessing the target area	Already existing data, if any (i.e. Municipality). On-site counting and/or interviews to the drivers (if necessary, during STEP1).	If possible, detailed by: <ul style="list-style-type: none"> <li>- Access timing (both allowed and not allowed time windows)</li> <li>- With or without access permit</li> <li>- Vehicle category</li> </ul>
Number of commercial vehicles for <b>construction activities/</b> buildings maintenance accessing the target area	Already existing data (i.e. Municipality, chamber of commerce). On-site counting (if necessary, during STEP1).	If possible, detailed by: <ul style="list-style-type: none"> <li>- Access timing (both allowed and not allowed time windows)</li> <li>- With or without access permit</li> <li>- Vehicle category</li> </ul>
Vehicle emission <b>EURO</b> classification	Already existing data (i.e. at national level, Ministry of transport) Interviews to the drivers (if necessary, during STEP1).	Detailed by fuel typology and EURO normative



### Section 7 – Last mile delivery processes – Vehicles access data

Information/Data	Source	Note
Frequency of delivery: N. of trips per day/week (or occasional) of transport/commercial/construction operator in the target area	Existing data (i.e. by Municipality) or Interviews to the drivers	Not needed at preliminary stage
N. of deliveries/trip	Existing data (i.e. by Municipality) or Interviews to the drivers	Not needed at preliminary stage
Average of transported freight weight	Existing data (i.e. by Municipality) or Interviews to the drivers	Not needed at preliminary stage
Load factor %	Existing data (i.e. by Municipality) or Interviews to the drivers	Not needed at preliminary stage
Delivered goods packaging (i.e. boxes, pallets, bulks, etc.)	Existing data (i.e. by Municipality) or Interviews to the drivers	Not needed at preliminary stage

### Section 8 – Environmental and energy aspects

Information/Data	Source	Note
Level of GHG emission due to the total traffic and to commercial traffic CO, NOx, PM10, CO2, CO2eq	Ministry of the environment. Environment agencies. Municipality.	In the overall urban area and, if available, in the target area.
Energy consumption related to commercial traffic TOE/y and KWh/y	Ministry of the environment. Energy agencies. Municipality.	In the overall urban area and, if available, in the target area.