



## LIFE ASPIRE PROJECT

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

Contr. No. LIFE16 ENV/IT/000004

Deliverable D.1.6

# Scientific papers

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LUCCA

**Abstract** 

The LIFE ASPIRE Project aims to implement a set of measures (regulatory, organizational,

operational and technological) related to city logistics processes, and in particular to last mile

deliveries, which extends/integrates the ones already implemented in the city of Lucca, in order to

achieve higher standards of energy efficiency and urban air quality and, consequently, improving

the quality of life of people (in particular of residents but also tourists).

In Lucca, among the others logistics measures, LIFE ASPIRE Project plans to introduce a "credit

based" access policy allowing a flexible application of road pricing criteria to the freight transport

operators. The innovative peculiarity of the Project is the implementation of a policy which rewards

transport operators on the basis of different factors (e.g. vehicle emissions and dimension, trips

frequency, etc.).

As operational instrument to manage this innovative policy, LIFE ASPIRE Project will implement in

Lucca a Logistics Credit Management Platform (LOCMAP). LOCMAP will also manage two new

logistics services (Load/Unload Parking Lots and Cargo-bike Sharing) and will integrate the existing

access control system, enhanced with RFID UHF technology.

The potential of replicability and transferability of the "credit based" Access Control policy

(including the new complementary logistics services), and the related supporting platform, will be

defined and verified in collaboration with the towns of Stockholm (SE) and Zadar (HR), taking into

account their specific contexts.

This Deliverable D.1.6 gives evidence of the scientific papers produced by the consortium

during the life spam of the project.

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#### 1.INTRODUCTION

## 1.1 Background and aim of LIFE ASPIRE Project

The main objective of LIFE ASPIRE project (Advanced logistics platform with road pricing and access criteria to improve urban environment and mobility of goods — Contract N°: LIFE 16 ENV/IT/000004) 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 will be 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 will define and implement a "credit based" access policy allowing flexible road pricing criteria related to last mile goods delivery: a dedicated management platform, two innovative services (smart Loading/Unloading Parking lots and Cargo-bike sharing stations) and the improvement of the existing Limited Traffic Zone access control system are the key elements of LIFE ASPIRE actions.

The demonstration activities in Lucca will be 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.

The LIFE ASPIRE main actions are the following:

Improvement of the existing Restricted Traffic Zone access control system and introduction of a "credit access" policy, allowing flexible road pricing criteria related to the last mile goods delivery;

- Design and implementation of a Management Platform (defined Logistics Credit Management Platform "LOCMAP") dedicated to urban freight distribution processes in Lucca;
- Equipment of a total of 22 gates with new RFID UHF devices (including the 10 gates of the current Access Control System, equipped with ANPR videocameras).
- Implementation of 34 Load/Unload (L/U) bays equipped with smart wireless sensors located in 12 L/U areas (with a variable number of parking lots each).
- Implementation of a new Cargo-bike Sharing Service available for transport operators in n. 3 stations (equipped with 3 cargo-bike each);
- Evaluation and periodic report updates of the LIFE ASPIRE measures, policies and regulations implemented;
- Promotion and diffusion of LIFE ASPIRE approach and results;
- Replicability and transferability analysis of measures/solutions implemented in Lucca in Stockholm and Zadar.

#### The LIFE ASPIRE major expected results can be summarised as follows:

- Reduce the current levels of freight traffic by decreasing the total number of commercial vehicles in last mile deliveries operations in the inner historic centre of Lucca (in particular in the RTZ);
- Reduce the current levels of environmental pollution due to commercial vehicle emissions;
- Reduce the related energy consumptions;
- Reduce the related noise pollution;
- Reduce risks for historic buildings due to vibrations resulting from heavy traffic;
- Promote the adoption of low/zero emission vehicles by transport operators;
- Provide new eco-logistics services for transport operators in last mile deliveries (Load/Unload parking lots and Cargo-bike Sharing), both managed by the innovative LOCMAP;
- Improve the safety for pedestrian;
- Improve the urban environment and, consequently, the quality of life for residents, visitors and tourists.

## 1.2 Action D.1 "Dissemination planning and execution"

This action regards planning and execution of dissemination activities including project website, production of dissemination materials, notice boards, networking with other projects, annual workshops and final conference, Layman's Report and many other specific dissemination activities, as detailed in the Sub-Actions.

Three annual project workshops had to be organized during the project lifetime: in Lucca hosted by LUCENSE at M13, in Stockholm at M21 and in Zadar at M31. The workshops, half/one day duration each, were aimed at:

- a) providing local dissemination of the LIFE ASPIRE approach;
- b) facilitating common discussion and consensus formation among the involved stakeholders;
- c) allowing to exchange views and experiences with other initiatives.

#### 1.3 Aim of the deliverable D.1.6

The aim of the current deliverable is to give evidence of the scientific papers produced by the consortium during the life spam of the project. In the following paragraph the produced papers are reported.

## 2. "LIFE ASPIRE project presentation" - TRB 2018



Paper on "LIFE ASPIRE project summary" at the Transportation Research Board (TRB) 97<sup>th</sup> Annual Meeting held in Washington, D.C. (USA), January 7-11, 2018.

TRB is the largest event in North America in the field of transport and logistics and one of the most important of the world. **The spotlight theme for the 2018 meeting was "Transportation: Moving the Economy of the Future".** TRB2018 meeting programme covered all transportation modes, with more than 5000 presentations in nearly 800 sessions and workshops addressing topics of interest to more than 13.000 professionals from all around the world.

A short summary of the project has been produced and distributed by Giorgio Ambrosino (MemEx) in the framework of workshop organised by the Federal Highway Administration (FHWA) and the European Commission (EC) on "**Urban Freight**", on January 11, 2018. Giorgio Ambrosino had the possibility to present and discuss the project, its mains actions (implementation in Lucca and transferability and scale up in Zadar and Stockholm) and outcomes with the participants of the roundtable coming from different EU and US public Authorities.

Here below the full text.



## 3. "Innovative city logistics "awarding" approach and accessibility framework in Lucca: the results of LIFE ASPIRE project" - ECOMM



Paper on "Innovative city logistics "awarding" approach and accessibility framework in Lucca: the results of LIFE ASPIRE project" submitted for the European Conference on Mobility Management ECOMM – Cascais 2020 (23rd edition).

ECOMM is a very important global event for everyone involved in mobility management. The main theme of ECOMM 2020 was "New Mobility...New Realities for People and Cities... OUTRA **VEZ!".** New technical possibilities, demographic trends and changing consumer behaviors are all putting traditional notions of mobility to the test. Consumers are demanding new, integrated mobility offers. At the same time, people's traditional mobility patterns are being questioned. In order to overcome some of the most prominent challenges and to be able to move fast forward to smart and sustainable societies, the ECOMM 2020 conference wants to actively encourage the debate on new mobility solutions at European level.

#### Here below the full text

Innovative city logistics "awarding" approach and accessibility framework in Lucca: the results of LIFE ASPIRE project

Authors: Antonio Liberato, Giorgio Ambrosino

Main topic: P2 - Circular Economy and shared economy: Mobility as a

Short Description:
The presentation concerns the key results achieved by LIFE ASPIRE Project in Lucca, highlighting the inn city logistics "awarding" approach developed, the new access control framework implemented and the sup measures. Transferability of the ASPIRE approach is presented with respect to different cities, Stockholm and Zadar (HR).

ASPIRE is a three years pilot project started in October 2017 and funded by LIFE programme, the EUs funding instrument for the environment actions

ASPIRE is led by the **Municipality of Lucca**, involving 6 partners from 3 EU Countries (Italy, Sweden, Croatia), including the **Stockholm** and **Zadar**.

ASPIRE implemented a set of innovative measures - regulatory, organizational, operational and technologi and in particular introduced a credit based urban access policy, allowing flexible awarding criteria in relative mobility behaviour of the relight transport operators in last mile delivers.

In developing ASPIRE Project, relevant efforts have been carried out in:

- adoption of awarding approach vs the fining criteria;
   identification of the most effective credit based urban access policy;
   definition of a new access regulation, supporting the adoption of the new implemented policies.

During the project, two set of awarding criteria, for the definition of specific access fee reductions, have been identified:

itics: related to the characteristics of the commercial vehicles (emissions, dimensions, etc.); \*\*amincs: related to the behaviour of the transport operators (i.e. permanence in the LTZ, frequess, time window used, usage of the L/U lots service, usage of the cargo bikes service, etc.)

The project also implemented an innovative Access Control System based on RFID te the OCR technology) for controlling commercial vehicles entrance/exit and their perma

nus, oplimising transport schemes, the Project enhances the efficient and effective use of transportimobil transfructures and, consequently, the operators in the supply chain and the shop owners benefit of an inc ficiency in freight distribution.

## 4. "Life ASPIRE: Logistica urbana sostenibile grazie alle nuove tecnologie" - TTS Italia

Life Aspire: logistica urbana sostenibile grazie alle nuove tecnologie



- scarico merci o bike sharing per la distribuzione dell'ultimo miglio



base mensile, numero di utilizzi del servizio di cargo-bile su base mensile, etc.

LOCMAP - Logistica C-redit Management Platform

LOCMAP è la piattaforma cloud, modulo che estende la ricca dotazione di moduli de

platfaforma NESC Goud, che consente la epetitione del credit di mobilità per la logist

urbana e le consegne dell'ultimo miglio (sco-points), integrata con il nuovo sistema

parking per il carico/scarico e cargo bile. LOCMAP raccoplie i dati ricevuti dal imana

parking per il carico/scarico e cargo bile. LOCMAP raccoplie i dati ricevuti dal indepositivi di carnopo (varchi REDI URF e sono di parmedogio in ane carico/scarico,

stazioni di cargo-bile sharing), il memorizza e il elabora per calcolare i comportame

di mobilità (per esemplo fasce orante di nepresso/ucta dalla TTL tempo di utilizzo delle cargo-bile sharing, etc.) su cui sono

basati qi eco-points.



LOCMAP è in grado di interagire secondo protocolli standard IoT con diversi applici software e dispositivi hardware e rappresenta la base di partenza per la realizzazio di un ecosistema per la gestione di policy innovative di premisilità per la mobilità unbana, in grado di integrare moltepolici tecnologie e applicazioni per formire servizi integrat, più efficaci ed efficienti. Infine ronisce uno strato di API multi-standard (REST / JSON, 2AOA / XML, MQTT, o specifiche) e si integra anche con il sistema e rilascio permessi gestion della mobilità), per recuperare i permessi associata al TAG UHF che i conducenti devono sepono sul pranbrezza.

Mobile ano Audroviti 116 a-mir.

Il sistema di controllo accessi/uscites i Gate RFID UHF

LOCMAP integra un sistema di monitoraggio basato sui varchi RFID UHF

per nortulare l'ingese e l'uscita dei viscoli commerciali dalla ZTL e il tempo di

permanenza all'interno. È importante ricordare che i dispositivi RFID UHF pr

consentono la trassissione vivilesa si un identificativo univoco. Le onde ra

varco attivano il tag UHF passivo (cioè che non necessita di batteria) che ris

vivindo il suo identificativo.

inviando il suo identificativo.

Il sistema per il monitoraggio degli stalli di carico/scarico: i sensori di sotta LOCNAP integra un sistema di monitoraggio dello stato di occupazione dei per facilitare la riccra degli stalli di carico/scarico morei con una positiva ri numero di veicoli commerciali circolanti nel centro citadino. Il sistema tecni il monitoraggio dei parcheggi circo/scarico is basa sull'uso di sensori cili monitoraggio deli parcheggi circo/scarico is basa sull'uso di sensori viole ("Parking Spot Sensori "1966 con doppia tecnologia magnetico/ultrasonico), raso con il manto stradela, per rilevare il camibio di stato (libero / costato) deli centro dei carico di car

- sentire all'utente registrato sulla piattaforma LOCMAP di sbloccare una cargo bike ite l'app mobile.

Dai nostri associati



Paper on "Life ASPIRE: Logistica urbana sostenibile grazie alle nuove tecnologie" submitted for TTS monthly newsletter - edition June 2021.

TTS Italia is the National Association for Telematics for Transport and Safety established with the aim of contributing to the improvement of the efficiency and safety of the Italian transport system, through the analysis of problems and opportunities, the formulation of proposals and the dissemination of information and knowledge in the field of Intelligent Transport Systems (ITS). TTS Italia brings together both public and private organizations active in the development and implementation of Intelligent Systems for Transport and Security, following the example of the model proposed by ERTICO at a European level and by other national associations such as ITS America, ITS Japan, ITS Canada, ITS United Kingdom, ITS France, ITS Sweden.

MUNICIPIA - Gruppo Engineering (IT partner of the project) has drafted a paper focused on the IT aspects of LIFE ASPIRE technologies. The paper has been published on "TTS Informa", the monthly newsletter of TTS Italia which is a very useful communication tool on the ongoing activities on ITS in Italy, in Europe and in the rest of the world, on business opportunities and major events. The Newsletter is published and sent monthly to the Association's e-mail address.