



Low carbon transport plan

Sustainable mobility for cruise passengers flows

Municipality of Ravenna

May 2018

Index

Index	2
1. Introduction.....	3
2. Low Carbon Transport Plan	3
2.0 Step 0: Work plan and team.....	3
2.1 Step 1: Initial assessment	5
2.1.1 Context analysis.....	5
1 General framework.....	5
2 Cruise flows and induced traffic	16
3 Cruise-sector mid- to long-term (5 to 10 years) development trends	20
4 Current cruise-related mobility and transport management policies and public & private initiatives addressing the existing flows.....	20
5 List of negative impacts linked to cruise-related flows	21
6 Infrastructures and services for the mobility of cruise passengers.....	24
2.1.2 SWOT Analysis	26
2.2 Step 2: Participatory process.....	27
1 Stakeholders identification.....	27
2 Process design	28
3 Results of the participatory process.....	32
2.3 Step 3: Design of the plan.....	36
1 The current scenario.....	36
2 Vision and objectives	36
3 Actions and indicators	37
4 Future scenarios	52
2.4 Step 4: Monitoring and funding	53
2.4.1 Monitoring LCTP implementation	53
2.4.2 Funding	65

1. Introduction

The Municipality of Ravenna, by Municipal Resolution DG 660/171469 dated 10/11/2016, effective 12/12/2016, pursuant to the law, has joined Project LOCATIONS, funded by the European Interreg MED 2014-2020 programme. The project is specifically aimed at countries in the Mediterranean area which benefit from a prosperous economy that relies on tourism closely linked to sea cruises.

Cruise tourism has increased significantly in recent years, and the Mediterranean coastal regions have benefited from it in terms of growth, development, reputation and visibility. Today, cities serving as cruise destinations face conflicting needs: on the one hand, increasing profits and economic advantages linked to cruise flows; on the other hand, the need to limit negative impacts on cities, in particular on the environment, urban mobility, cultural heritage and the life of the local community.

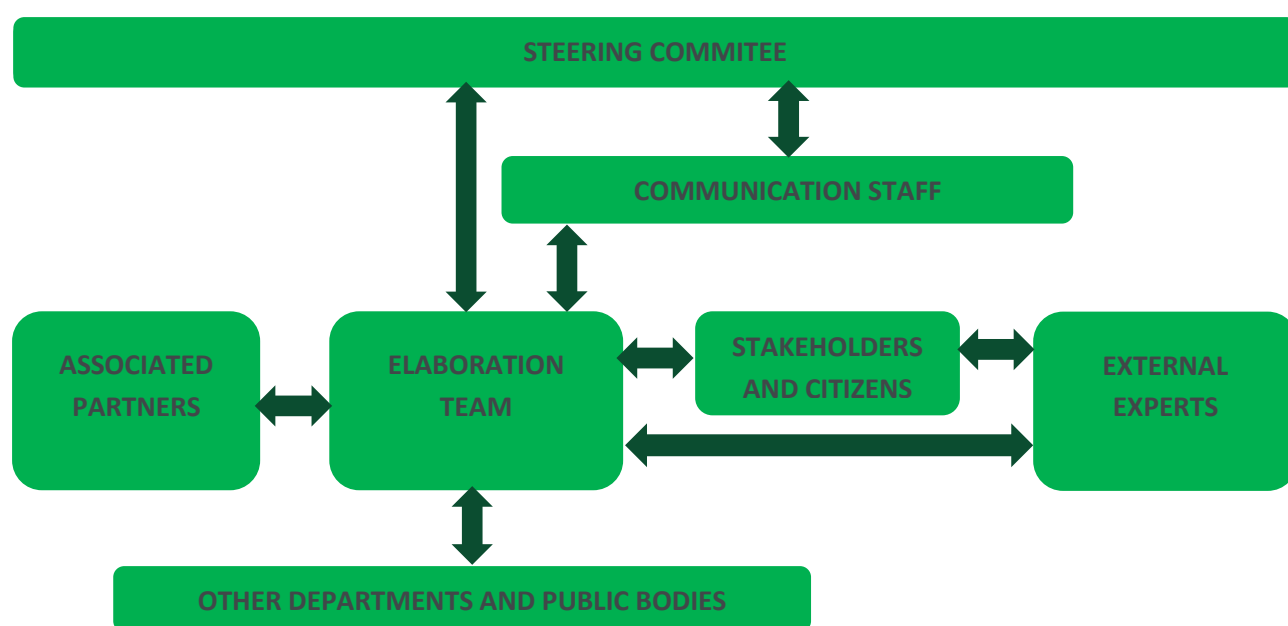
LOCATIONS project intends to contribute to decongesting traffic flows and limiting polluting emissions in cruise destination cities, using innovative and sustainable transport solutions. In this way, it will be possible to improve the quality of life of residents and cruise passenger experience, increasing the attractiveness of ports for cruise operators.

Seven cities (Lisbon, Malaga, Trieste, Ravenna, Rijeka, Zadar, and Durres) are involved in the project, and the aim is to develop a Low-Carbon Transport Plan (LCTP) - which is easily transferable to other Mediterranean centres facing similar problems. The objective of the Plan is to promote the use of low-emission transport systems and multimodal connections for cruise passengers, in the general framework of energy planning and municipal mobility (SUMP, Sustainable Urban Mobility Plan, and SEAP, Sustainable Energy Action Plan).

For these reasons, the Ravenna LCTP constitutes a first implementation of the Urban Plan of Sustainable Mobility to improve the connections between the cruise terminal and the entire municipal territory.

2. Low Carbon Transport Plan

2.0 Step 0: Work plan and team



► WORK TEAM

The work team involved in the development of the LCTP included several people with different positions and responsibilities. The diagram above represents the different groups that had supported the elaboration of LCTP and the relationship between them.

Steering Committee | It includes both a technical and political part and it took strategic decisions

Elaboration Team | they are in charge of the elaboration of the Plan, including collection and analysis of data. They are the core team, since all other groups relate with them and they report directly to the Steering Committee

Stakeholders and citizens | they are the players that hold any kind of interest to the LCTP

External Experts | two external experts had been identified to support the elaboration of the LCTP.

Associate partners | Ravenna Port Authority and Emilia Romagna Region, have been involved in the elaboration of the Plan

Other Department and Public Bodies | Several Departments of the Municipality and other Public Bodies that must give permissions in the implementation phase have been involved in the design of the LCTP.

Communication Department | they have worked with the elaboration team in the definition of the communication strategy

► WORK PLAN

	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10
Collection and analysis of data										
Design of participatory process										
Implementation of participatory process										
Elaboration of first draft of the Plan										
Elaboration of final Plan proposal										
Approval of LCTP										
First implementation phase										

2.1 Step 1: Initial assessment

2.1.1 Context analysis

1 General framework

► REFERENCE GEOGRAPHICAL CONTEXT

The cruise terminal is located at Porto Corsini, and was inaugurated in 2011. To date, it includes two landing docks able to accommodate ships up to 330 m, although the terminal is still under development.

The main tourist attractions of the city of Ravenna are its 8 UNESCO monuments, 7 of which are located in the historic centre, or its immediate vicinity.

Porto Corsini is a hamlet of the municipality of Ravenna, has 1517 inhabitants (Source ISTAT), is located about 15 km from the historic centre of Ravenna and connected to Marina di Ravenna, the most significant hamlet standing opposite to the Candiano Canal, in a continuous way, from a ferry for passengers and vehicles.

Porto Corsini is crossed by three road axes: via Molo San Filippo, via Volano, which continues towards the coast taking the name of via Po and allowing a single direction of travel towards the sea, and via Giuseppe Guizzetti, a one-way street heading to Ravenna. In addition to traffic related to cruise flows, Porto Corsini is affected by seasonal flows due to the presence of an equipped camper area and bathing establishments that attract tourists on a daily basis. The location is also in the immediate vicinity of several naturalistic areas included in the Po Delta Park.



► EUROPEAN REGULATORY FRAMEWORK

In light of the global change to a low-carbon and circular economy in progress, in 2016, the European Commission adopted a low-emission mobility strategy which aims to ensure Europe a competitive position capable of responding to a constant increase in the need for mobility of people and goods. The European response to the challenge of reducing emissions in the transport sector is an irreversible change towards low-emission mobility. By 2050, the emissions of greenhouse gases produced by the transport sector will have to drop by at least 60% compared to 1900, and Europe will have to be decidedly positioned on a zero-emission path.

The “Strategy for low-emission mobility” incorporates a broad set of measures to support Europe's transition to a low-carbon economy, as well as job creation, growth, investment and innovation. The strategy identifies three priority areas of intervention:

1. increase in the efficiency of transport systems through the digitalisation of technologies, smart pricing policies and further incentives for the use of low- or zero-emission vehicles;
2. acceleration of the use of renewable energy sources, such as bio fuels, electric and hydrogen mobility, and the removal of obstacles to transport electrification;
3. transition to zero-emission vehicles; the European Community must accelerate the transition towards low-/zero-emission vehicles.

The strategy is part of the policies that the European Commission has been promoting for the preparation of Sustainable Mobility Urban Plans since 2013. In actual fact, a package of measures for urban mobility recently developed includes, in addition to SUMP, initiatives for the adoption of road pricing measures, traffic limitation in urban areas, the production of good practices, the monitoring of actions and the management of goods flows in the city.

The city of Ravenna fully shares the EU's urban mobility policies also by joining the CIVITAS network, a city network dedicated to sharing experiences and best practices for the development and implementation of strategies, policies and measures in the area of sustainable mobility.

► SUMP REGULATORY FRAMEWORK

The *Low Carbon Transport Plan* is the first implementation action of the SUMP: for this reason, the main points of the reference regulatory framework refer to SUMP Action Plan.

The SUMP is a strategic Plan conceived within national and regional legislation and European directives as a strategic document with the function of setting up policies for mobility and infrastructure interventions.

At the national level, the first legislative reference to the SUMP, although generic, is contained in Legislative Decree 257/16, concerning the infrastructures for alternative fuels. Until August 2017, the relevant legislation was Law 340 of 24.11.2000, whose Art. 22 introduces and defines the main objectives of the Urban Mobility Plan (UMP). On 5 August 2017, the Ministry of Infrastructures and Transport issued a Decree setting out the guidelines for Sustainable Mobility Urban Plans, which refers to ELTIS “Guidelines. Developing and Implementing a Sustainable Urban Mobility Plan” (ELTIS Guidelines), approved in 2014 by the European Commission's Directorate General for Mobility and Transport and already adopted by the Municipality of

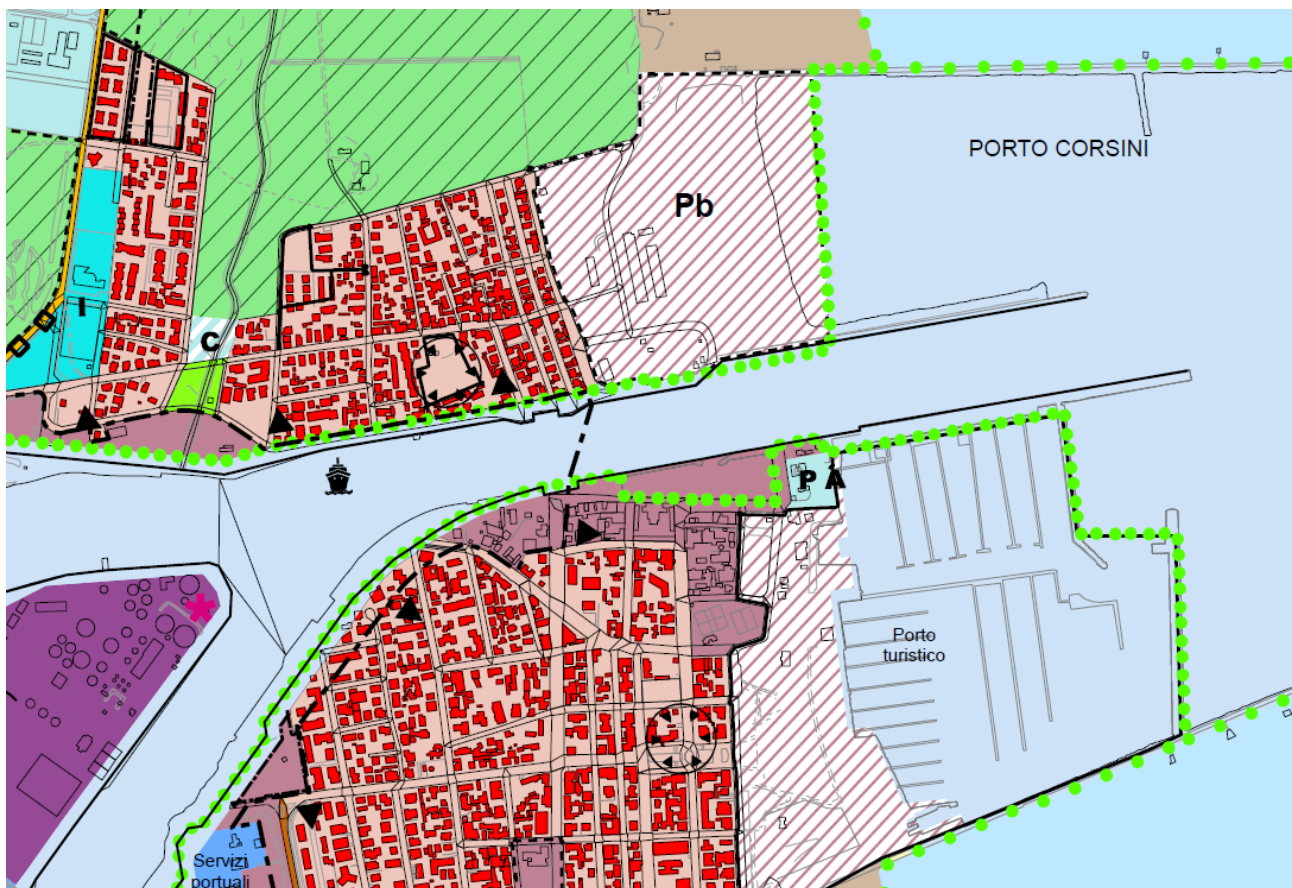
Ravenna. The national guidelines have been developed at ministerial level by a working group set up at the Ministry of Transport in the context of the “Po Valley Agreement” (Accordo del Bacino Padano); the Municipality of Ravenna also took part in this working group.

Compared to previous strategic planning tools, the SUMP has a more specific connotation for two fundamental reasons: first, it focuses on the local dimension and is closely related to the essential integration of spatial planning and mobility tools; second, it refers to transport planning tools introduced at the European level through the drafting of Sustainable Mobility Urban Plans, as tools for the definition of policies consistent with environmental, social and economic sustainability criteria, which can promote-favour the sharing of objectives and choices with the large community of citizens and stakeholders who are representative of the various interests in the field.

The Municipality is currently engaged in the SUMP-adoption phase.

► CITY PLAN

The City Plan in force was approved on 27/02/2007 by City Council Resolution 25/2007, when the passenger terminal had not yet been completed. The document identifies a Plan of public initiative (PB) behind the cruise terminal, which, however, was eventually scrapped.



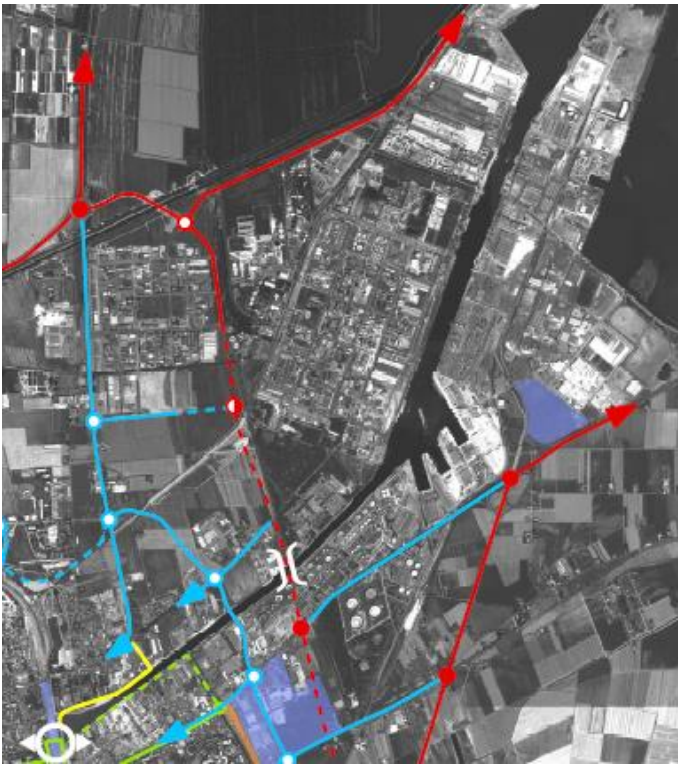


Figure 1: Part of 2.8 e 2.5.b maps of the City Plan

Urban Implementation Plan (UIP) was approved on 16/02/2016, and stipulated on 08/09/2016.

The City Plan provides for the construction of a golf facility in the town of Casalborsetti, which is located about 8 km from Porto Corsini, whose

The Strategic City Plan does not include project road infrastructures specifically for the passenger terminal; the main infrastructures that affect the port area include the new bridge on the Candiano canal for the completion of the outer ring road and the adaptation of via Baiona, from via Canale Magni to the entrance of the inhabited centre of Porto Corsini. The 2017/2019 Triennial Plan of Public Works foresees extraordinary maintenance interventions on the traffic in the port area and structural adjustment interventions without any modification of the roadway on the via Baiona bridges, near the town of Porto Corsini.

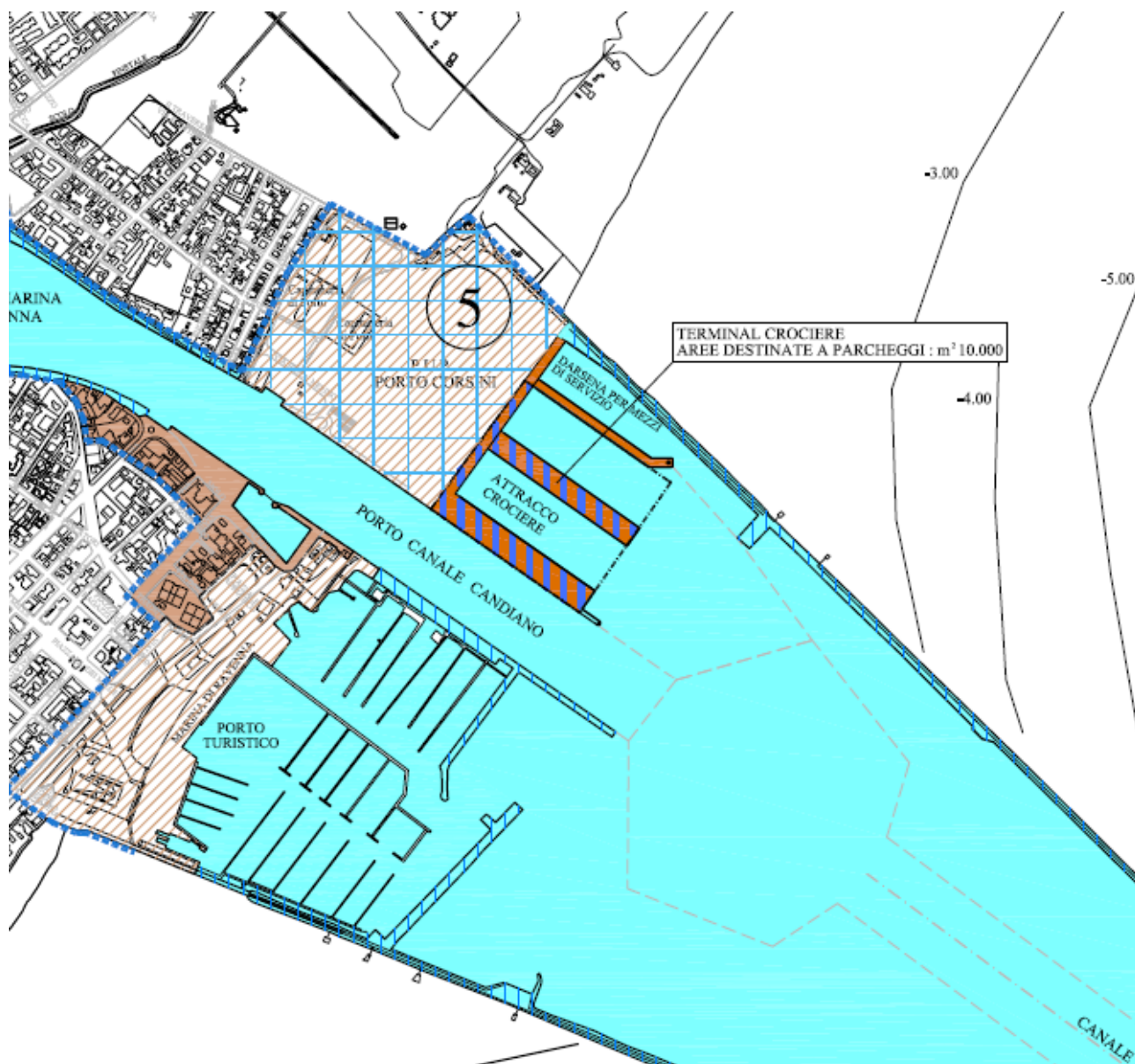
As far as cycling links are concerned, the Plan provides for a route that connects the town of Porto Corsini with Le Bassette, one of the main industrial area of Ravenna. The SUMP now being adopted provides for the completion of bike trails between Porto Corsini and the centre of Ravenna, which are currently interrupted on the main traffic routes (via Romea nord, via Baiona and via Canale Magni)

► PORT PLANNING

2007 PORT REGULATORY PLAN

The 2007 Port Regulatory Plan, adopted by Port Committee Resolution no. 9 of 9.03.2007 and approved by Provincial Government Resolution no. 20 of 3.02.2010, still in force, includes the **realization of the current specialized cruise dock**, in addition to other development works. “The pier for large cruise ships, 40 m wide, [...] can host two ships at the same time; the dimensions are such as to be able to accommodate the main equipment required by this type of traffic, as well as buses used for sightseeing by passengers”.

A detailed unit plan of Porto Corsini had been envisaged in the area behind the terminal, approved in 2004, by Port Committee Resolution no. 58, though it was subsequently scrapped.



- ⑤ : PORTO CORSINI - il P.U.P. è suddiviso in quattro zone funzionali urbanistiche con le seguenti destinazioni d'uso:
- verde attrezzato, spazi di sosta attrezzati, servizi ristoro e di custodia, pubblici esercizi, attrezzature per lo sport e il tempo libero
 - servizi urbani di integrazione all'abitato, residenza, esercizi pubblici, servizi di quartiere, verde attrezzato e parcheggi
 - attività ricettive e turistiche, attrezzature culturali e per lo spettacolo, attività direzionali
 - attrezzature militari e amministrative di servizio al porto e relativi spazi di pertinenza

THREE-YEAR OPERATIONAL PLAN

The latest Triennial Operating Plan approved by Management Committee Resolution no. 10/2017 refers to the three-year period between and including 2017 and 2019. The Plan is structured around five strategic programmes:

- i. digitalization of logistics and ICT;
- ii. last/penultimate railway mile and connection to network;
- iii. last road mile;
- iv. maintenance of public property - state property | Maritime accessibility | Selective increase of port capacity;
- v. energy and environmental efficiency.

Within the fifth strategic programme, the Plan cites LOCATIONS project as part of the actions that Port Authority is implementing to define a road map for the sustainable development of the Port. Finally, among the actions to promote the Port potential, the Plan introduces the theme of waterfront redevelopment: “[...] Port Authority is currently evaluating the start of redevelopment processes of parts of the Porto Corsini canal front. [...] The project includes an area on which spaces related to the cruise terminal are to be allocated, and another allocating spaces for other activities related to tourism and services of interest to the port”.

HUB DEVELOPMENT PLAN OF RAVENNA

The Global Project (GP) – ‘Hub Development Plan of Ravenna’ – comprises the following interventions:

- Marine port infrastructure (dredging the canal in order to accommodate larger vessels);
- Land side port infrastructure (upgrading and developing infrastructure and platform services, handling areas and freight storage areas);
- Port accessibility (developing and creating an “integrated network” between maritime infrastructure and land-based infrastructure).

The intervention is divided into three main stages. The projects aims at maximising the port’s capacity, at pace with the evolution of maritime traffic, through infrastructure development. Interventions are then required to guarantee all necessary conditions (e.g. space, water depth, facilities, access and connections) to handle larger vessels and higher traffic volumes, even for cruise tourism.

The project was included in the Italian Strategic Infrastructure Program and therefore approved on 26.10.2012 (Resolution no. 98), at its preliminary project stage, by the CIPE (Interministerial Committee for Economic Planning) which granted RPA a contribution of a considerable amount, for the implementation of the project.

PROJECT FOR THE HARBOUR FRONT

Port Authority is preparing a project for a new harbour front in Porto Corsini. The project, whose details have yet to be defined, includes three sections. The first concerns the arrangement of the square in front of the terminal, with the creation of parking spaces for buses and vehicles, and the arrangement of the sediment tank shielded by shrubbery and shading tree species. The second section involves the construction of services for other maritime activities, storage of nautical vessels, military structures for surveillance services and police force, and services for minor boats with slide for in-water launch. The third and final section includes

the expansion of the current camper area and construction of equipped green areas. The Municipality of Ravenna will be involved in the approval phase of the final project and will collaborate with Port Authority for a project development consistent with the results of the LCTP.

► I PRINCIPALI VINCOLI

I principali vincoli che ostacolano, almeno nel breve periodo, nuovi collegamenti via mare o la realizzazione di nuove infrastrutture viarie sono i seguenti:

- Il Regolamento di navigazione vigente nel porto di Ravenna;
- la presenza di un'area naturale protetta.

Nell'immaginario di molti cittadini ravennati è diffusa la suggestione dell'approdo dei crocieristi via mare nella Darsena di città, uno spazio a ridosso del centro storico che potrebbe risolvere in parte la problematica degli spostamenti dei crocieristi da Porto Corsini a Ravenna. Precisando che la profondità dei fondali non consentirebbe l'arrivo delle crociere sino alla testata di Darsena, questa soluzione sarebbe praticabile con delle motonavi veloci per il trasporto dei passeggeri da Porto Corsini a Ravenna lungo il canale Candiano. L'assenza di un collegamento diretto tra la Darsena – punto di approdo dei mezzi - e il centro storico dovuto alla presenza della linea ferroviaria è una criticità non trascurabile. Occorre considerare anche l'aspetto della praticabilità del collegamento marittimo. Secondo il "Regolamento per la navigazione, la sosta, gli accorsi e la precedenza negli stessi della navi e dei galleggianti nel porto di Ravenna", approvato con Ordinanza n.35/2011, ad oggi la velocità massima consentita nel canale Candiano è pari a 6 nodi, circa 11 km orari (art.22). Allo stato attuale la navigazione dal molo del terminal crociere alla darsena di città impiegherebbe più di 60 minuti. Inoltre, le stesse imbarcazioni dovrebbero dare la precedenza a tutte le navi commerciali come riportato nell'art. 25 del Regolamento. Allo stato attuale si ritiene dunque difficile un implementazione di questa soluzione nel breve periodo.

Un'altra possibilità che si ripropone come soluzione alla riduzione del traffico veicolare legato agli spostamenti dei crocieristi riguarda la realizzazione di una nuova infrastruttura appositamente dedicata al terminal per collegarlo direttamente con la principale direttrice di accesso a Ravenna, la S.S. 309. Questa soluzione comporta però l'attraversamento dell'area SIC IT4070005 "Pineta di Casalborsetti, Pineta Staggioni, Duna di Porto Corsini". La pineta ricade nei siti Natura 2000 in cui sono vietati gli interventi, le attività e le opere che possono compromettere la salvaguardia degli ambienti naturali tutelati, con particolare riguardo alla flora, alla fauna ed agli habitat di interesse comunitario tutelati ai sensi delle Direttive n. 92/43/CEE.

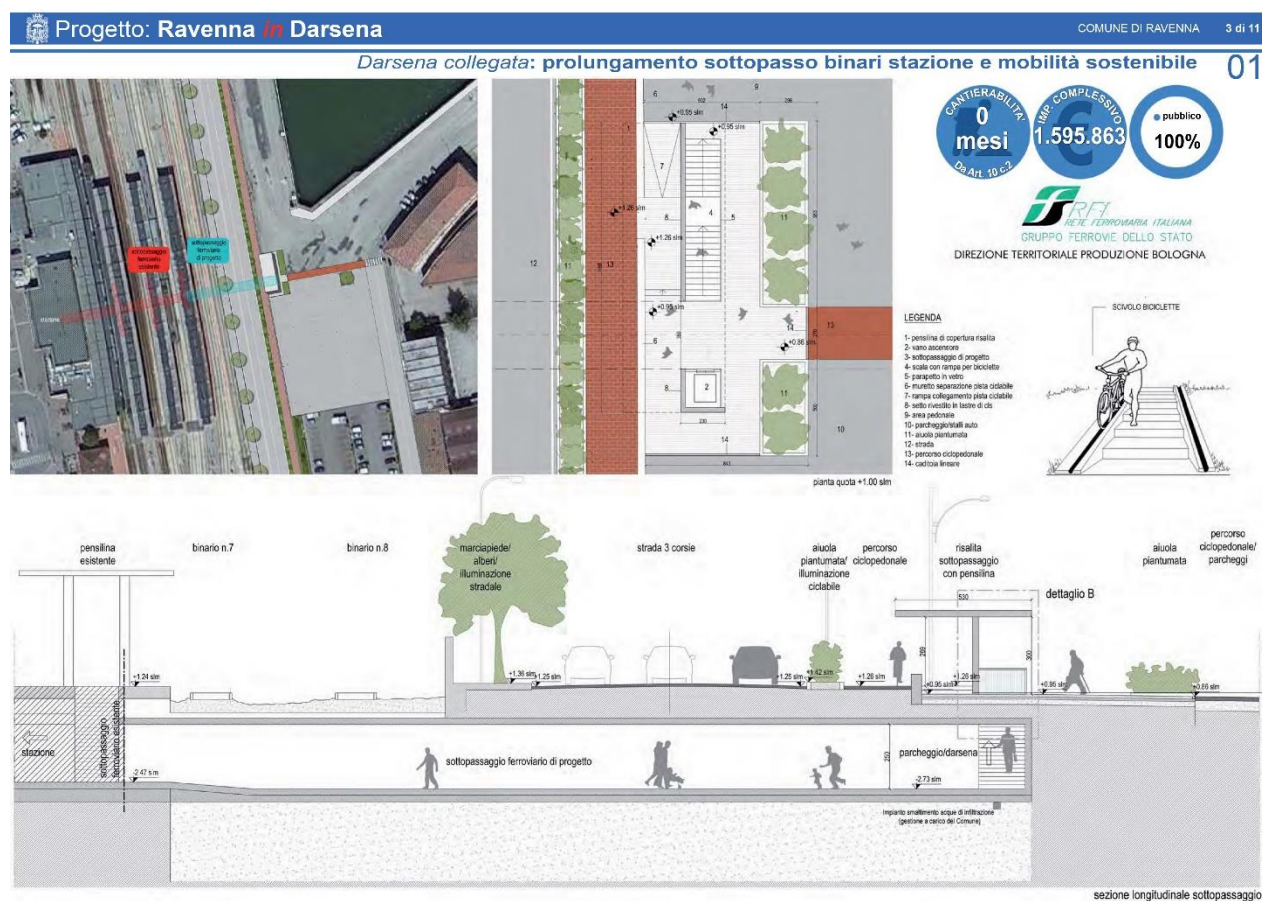
► DOCK DEVELOPMENT - SQUARE ON THE CITY SEA

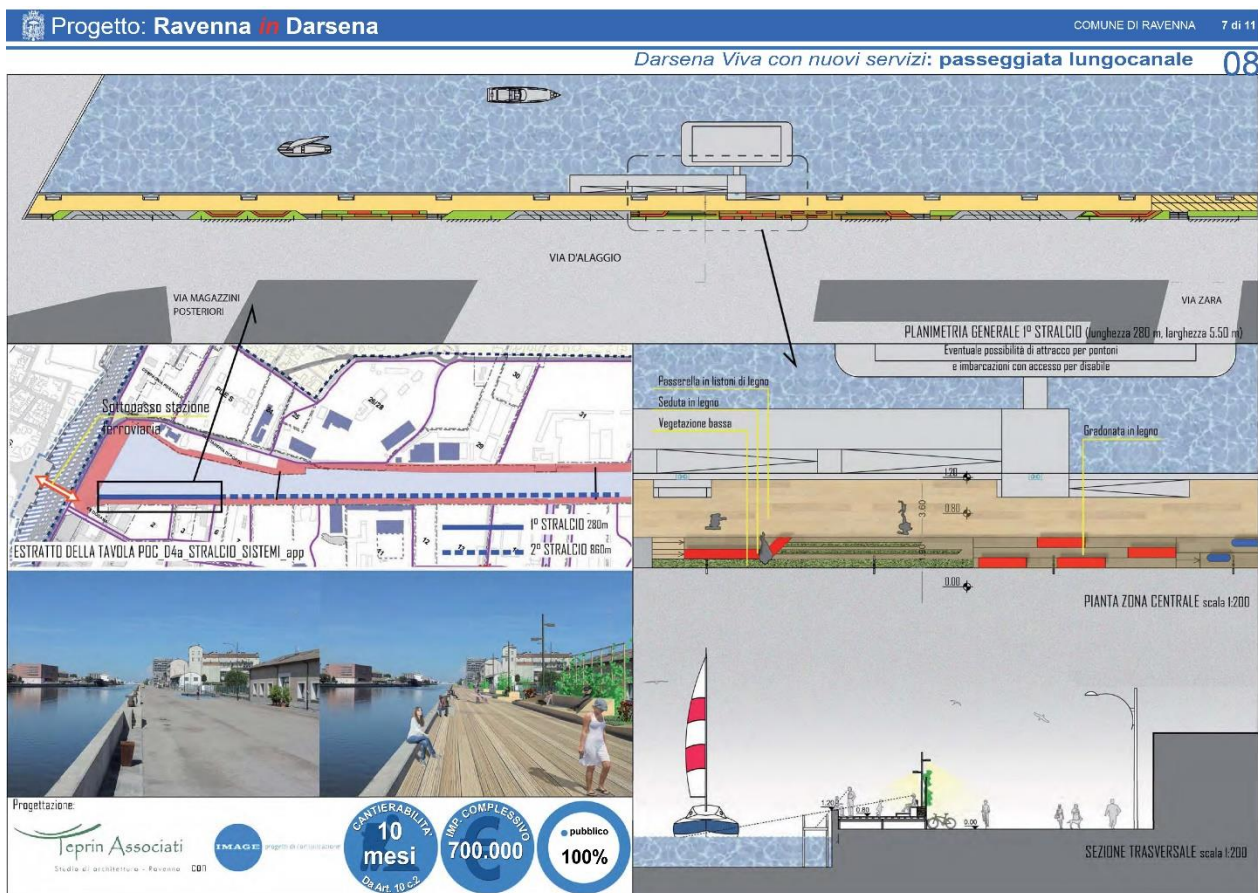
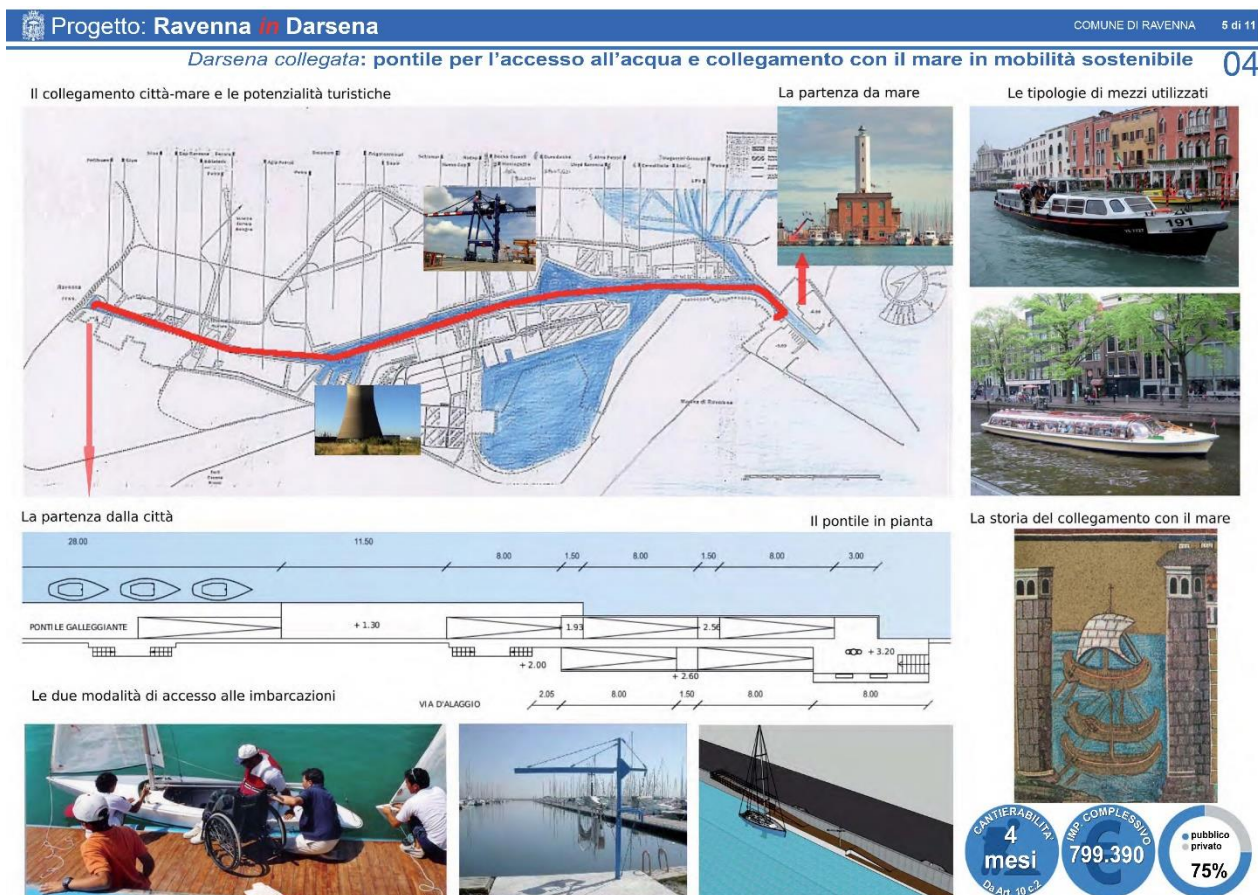
The Municipality of Ravenna submitted to the Presidency of the Council of Ministers a project for the redevelopment of the city dock in the context of the Extraordinary Intervention Programme for urban redevelopment and security in the suburbs of metropolitan cities and provincial capitals. According to the CIPE (Comitato interministeriale per la programmazione economica, Interministerial Committee for Financial Planning) Resolution published on 13/06/2017 in the Official Journal of the Republic of Italy, necessary funds were also allocated to the realization of the project presented by the Municipality of Ravenna.

The submitted project "Ravenna in Darsena il mare in piazza" (Ravenna on the Dock, Sea in the Square) is related to the urban redevelopment of the "destra canale" area. It consists of an organic set of interventions

strategically and uniquely aimed at taking off the more comprehensive urban redevelopment/reconversion based on the main idea of constituting a single territorial system from city to sea. The area overlooking the last section of the port canal for about 1.7 km is adjacent to the centre and the main square; therefore, it is located strategically with respect to the city, serving as a potential role of hinge between sea and centre (square), a role now hindered by the train station, which constitutes a barrier. The project consists of 12 interventions, 3 of which could have a strong influence on the transfer of cruise passengers. In fact, the 3 interventions entail the construction of a floating jetty without architectural barriers, the purchase of a hybrid boat for passenger transport to and from the sea, and the extension of the current station underpass with ascent to the strategic area at the head of Dock, near the pier for docking of transport means for connection to the sea.

The realization of these works opens a scenario in which at least a part of cruise passengers could arrive in Ravenna by sea through the Candiano canal with low-environmental impact vehicles, thus reducing the pressure on vehicular traffic, particularly in the town of Porto Corsini.





► THE LNG PROJECT IN RAVENNA

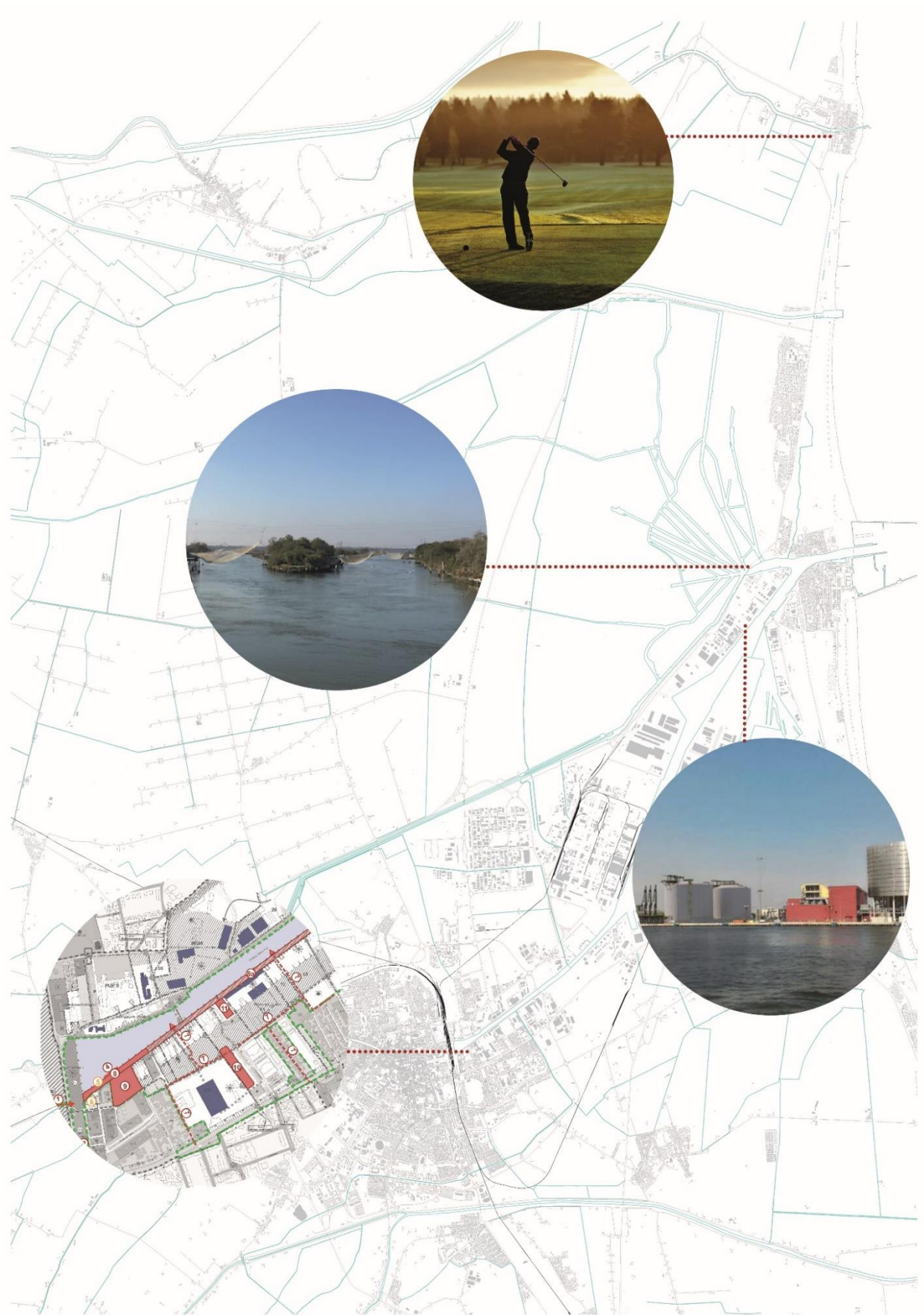
Within the context of Legislative Decree 257/2016, which provides for the construction of an adequate number of LNG refuelling points in the ports belonging to the TEN-T central network, of which Ravenna is a core port, Società Petrolifera Italo Rumena S.p.A. (PIR S.p.A.) intends to create a deposit for the reception and storage of Liquefied Natural Gas (LNG) within the industrial area of the port of Ravenna, in the town of Porto Corsini. The company has already submitted the necessary documents to receive the authorizations necessary to carry out the work. The deposit will be built in the area adjacent to the Bunge S.p.A. headquarters and to the Enel Plant. This area is currently not used, and free from facilities. Furthermore, the port of Ravenna is also involved in the industrial research project Clean Port (<http://www.cleanportravenna.it/>), which aims at the LNG retrofitting of the current Porto Corsini - Marina di Ravenna ferry.

The development of LNG plants could have a positive impact on the environmental aftereffect of cruise traffic, reducing the emissions of ships and smaller boats used to transport cruise passengers from the terminal to the city Dock.

► AGREEMENT FOR THE ENHANCEMENT OF PIALASSA DELLA BAIONA

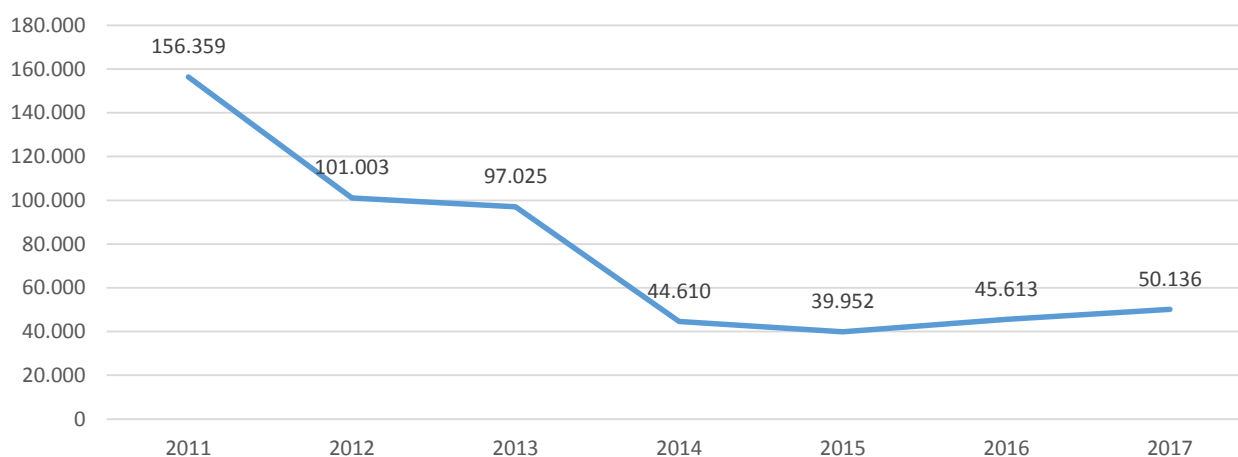
In August 2017, Ministry of Agricultural, Food and Forestry Policies, Emilia-Romagna Region, Port Authority of the Northern-Central Adriatic Sea, Park Authority of the Po Delta Park and Municipality of Ravenna signed a Memorandum of Understanding aimed at the recovery and enhancement of Pialassa Baiona. The purpose of the agreement was to realize the recovery and enhancement of the municipal “Pialassa Baiona” wetland and of the old building of the fish market of Marina di Ravenna, fielding resources for a value of over 5 million EUR.

Concerning Pialassa Baiona, the project intends to countervail the deterioration and progressive loss of biodiversity, by promoting its restoration, thus guaranteeing its vitality and functionality. The biodiversity conservation activities for Pialassa Baiona provide for the restoration of its waterway system and water circulation, thus allowing the revitalization of the basin and ensuring the oxygenation of waters and maintenance of temperatures and salinity compatible with diversified habitats. The programme includes, in particular: the opening of water connection systems between the Lamone river and Pialassa Baiona to encourage the exchange of lagoon waters and circulation through canals and basins, and the adaptation of existing systems for the control of tributaries; the reprofiling of embankments and sandbanks in the northern part of Pialassa Baiona; environmental restoration and naturalistic recovery interventions, such as the removal of waste and abandoned structures including asbestos; and, the restoration of native coastal vegetation for screening purposes and biodiversity enhancement.



2 Cruise flows and induced traffic

In recent years, the port of Ravenna has been considered a transit port, mainly providing for ships in transit and, in a smaller measure, ships whose final destination or departure was Ravenna.



Data show that in 2011 passengers exceeded 150,000 units in a year; in 2014, numbers decreased by more than half, even though the last two years showed a slight improvement. Many causes are attributable to this decline (for example, the issue of large ships in Venice and the Costa Concordia accident) and are part of a global picture of economic crisis that affected all cruise ports. In recent years, there has been a slight recovery in passenger numbers, with an annual increase of 10% since 2015.

Data on vessel size are available from 2014. There is an increase in the number of ships under 500 passengers and a fluctuating trend as far as large ships are concerned.

On average, ships stop in Ravenna for around 10 hours. Taking into consideration a duration of about 2-3 hours for disembarkation and embarkation operations, cruise passengers have at most about 8 hours to make a visit on land. On average, the arrival time is around 7.30 am, with departure being around 7.00 pm.

Cruise tourism in Ravenna does not continue throughout the whole year: the first arrivals begin in March, even though most of the trips are from May to October. Finally, a very limited number of cruises docks in November and December.

The traffic linked to the supply of goods for cruise ships is negligible.

► CRUISE PASSENGERS IN RAVENNA

Profiling cruise passengers - or "visitors aboard ships" - is challenging because such visitors fall into a variety of juxtaposing and intersecting categories.

One such category is **geographical origin** and consequent lifestyles/approaches to the trip. On average, Europeans are more accustomed to visiting artistic centres and to engage with spaces and location features; they are open to moving on foot and their health, even at a later age, usually allows it without much difficulty. On the other hand, US cruise passengers tend to visit cities in vehicles, a cultural issue reinforced by health conditions that frequently require to limit transfers; on the basis of what emerged from meetings with stakeholders, such tourists tend to delegate the organization of their trip in its entirety, minimizing efforts. Finally, Asian tourists, now still a minority share, suffer the charm of "Made in Italy", intended primarily as

“status symbol” (it is the appeal of brands such as Ferrari, Lamborghini and Ducati that attracts them to the so-called Motor Valley).

A second category is represented by clientele features that depend on the travel **season**: if in spring and autumn most tourists are middle aged, or older, with a good incidence of people older than 70 years, sometimes even with health problems or requiring walking aids, summer tourists tend to be younger, and include families with children and young couples.

A third possible differentiation is **financial means**: tourists in the medium-high segment move by shuttle, taxi or rental car with driver, and entrust to agencies the organization of excursions or - if particularly interested - book private tours that, in small groups of 4 or 6 people have costs comparable to tours offered aboard ships; often, the favourite seasons for travel are spring and autumn, since mild climate and reduced number of tourists allow a more satisfying experience. Middle-segment tourists often move by shuttle, and do not require the services of a tour guide, since they organize themselves using information found mainly on the web; the remaining segment uses public transport and, again, information found online.

An element that cuts across all three categories of tourists is physical disability, or, at least, motor difficulties: cruise tourism is a favourite among people with disabilities: the share of passengers with disabilities or reduced mobility is, on average, more significant than in other types of tourism.

Both from the analysis of landings data and the experience shared by stakeholders, Ravenna is a mid-to-high-end destination: ships with over 2000 passengers account for a quarter of the total number and they are exceeded by luxury ships with less of 100 passengers.

► INDUCED TRAFFIC IN PORTO CORSINI

Since opening the terminal, several traffic flow detection campaigns have been conducted in Porto Corsini. The first surveys were carried out by the Municipality of Ravenna on the occasion of the first docking of cruises and during the works carried out to rebuild the Marina di Ravenna - Porto Corsini ferry dock. Subsequently, other surveys were carried out for the preparation of the “Environmental Study (Traffic, Acoustics and Air Quality)” of the “specific variant to the 2010-2015 POC/Municipal Operational Plan - M02 card Porto Corsini Terminal - creation of service infrastructures at the cruise ship dock”.

From March to August 2017, the Municipality of Ravenna carried out a campaign to detect traffic flows for the purpose of assessing the effective increase in traffic flows during the summer season and on the days of disembarkation of cruises. Two instruments were installed for the detection of traffic flows, one on via Volano and the other on via Molo San Filippo.

MONTH	VIA VOLANO							
	Day	Average ve/d	Average day 7-20	Max ve/h	HGV/d	HGV/d 7-20	Max HGV/h	% HGVs
Apr-11	Working day	2700	N.A.	120	N.A.	N.A.	N.A.	N.A.
May-11	Holiday day	4000	N.A.	480	N.A.	N.A.	N.A.	N.A.
	Cruise call day	3500	N.A.	300	N.A.	N.A.	N.A.	N.A.
	Working day*	3200	N.A.	260	N.A.	N.A.	N.A.	N.A.
Cct-14	Holiday day*	1500	N.A.	160	N.A.	N.A.	N.A.	3%
	Cruise call day*	1500	N.A.	160	N.A.	N.A.	N.A.	7%
	Working day*	140	N.A.	140	N.A.	N.A.	N.A.	5%
Mar-17	Working day	2200	140	200	N.A.	N.A.	N.A.	6%
	Holiday day	2500	160	250	43	35	8	5%
	Working day**	3300	200	300	120	115	18	9%
Jun-17	Holiday day	3500	200	300	140	100	20	2%
	Cruise call day	3200	200	260	175	130	21	9%
Jul-17	Working day	3400	200	280	120	90	13	3%
	Holiday day	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Aug-17	Holiday day	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
	Cruise call day	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

Tabella 1: Sintesi dei flussi rilevati a Porto Corsini in via Volano

VIA MOLO SAN FILIPPO								
MONTH	Day	Average ve/d	Average day 7-20	Max ve/h	HGV/d	HGV/d 7-20	Max HGV/h	% HGVs
Apr-11	Working day	2300	N.A.	100	N.A.	N.A.	N.A.	N.A.
May-11	Holiday day**	2600	N.A.	250	N.A.	N.A.	N.A.	N.A.
	Cruise call day*	2300	N.A.	160	N.A.	N.A.	N.A.	N.A.
	Working day	2000	N.A.	170	N.A.	N.A.	N.A.	N.A.
Cct-14	Holiday day	1300	N.A.	130	N.A.	N.A.	N.A.	N.A.
	Working day	1400	N.A.	115	N.A.	N.A.	N.A.	N.A.
	Cruise call day	1200	N.A.	100	N.A.	N.A.	N.A.	N.A.
Mar-17	Holiday day	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
	Working day	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Jun-17	Working day	2400	130	190	140	110	17	6%
	Holiday day	3100	140	220	200	100	17	4%
	Cruise call day	2400	140	170	260	250	34	9%
Jul-17	Working day	2500	140	180	150	125	15	6%
	Holiday day	3300	160	180	160	100	17	5%
Aug-17	Holiday day	4500	200	450	200	150	20	5%
	Cruise call day	4100	200	300	277	230	30	7%

The tables show the summary of data that have been collected since 2011: vehicular traffic flows in Porto Corsini are subject to seasonal variation that causes a sharp increase in daily traffic in the summer season. Daily flows are increased by around 1,000 vehicles per day (around 50 vehicles per hour); consequently, the maximum peak also increases to about 100 ve/h in the summer season. During daylight hours (7 am - 8 pm), the average hourly vehicle traffic flow is around 150 ve/h (2.5 vehicles per minute) in winter and 200 ve/h (3.5 vehicles per minute) in summer. Flows are greater on via Volano and via Po, considered the main access routes to the town.

Flows generated by cruise tourism are to be considered within this framework and they do not increase the volume of traffic compared to an average working day significantly. The substantial change concerns the flows of heavy vehicles that record a net increase on docking days, going from about 5 to 10% of the daily traffic flows.

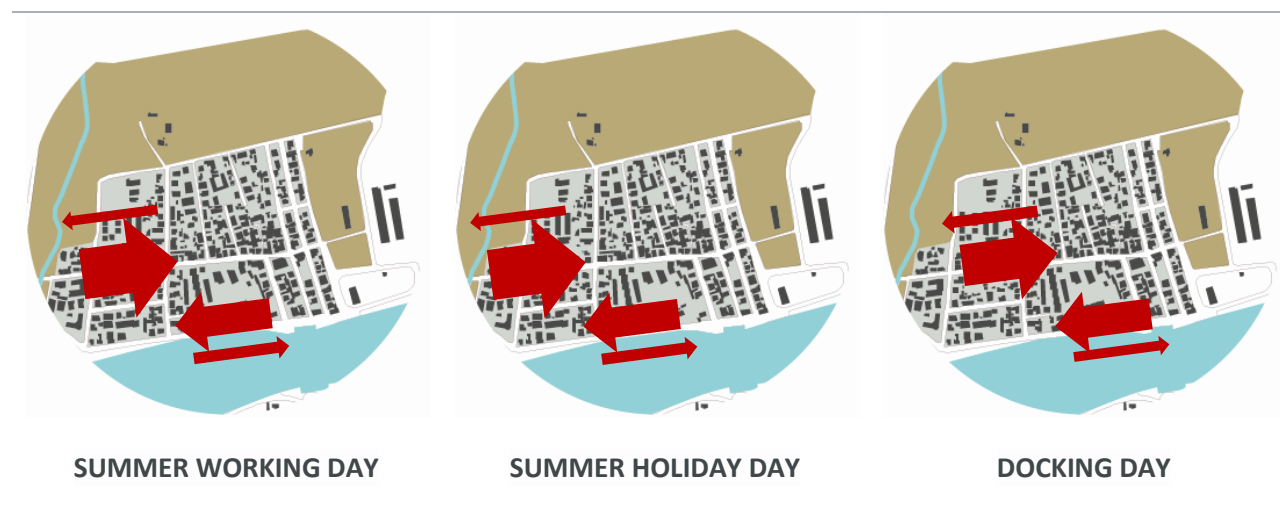
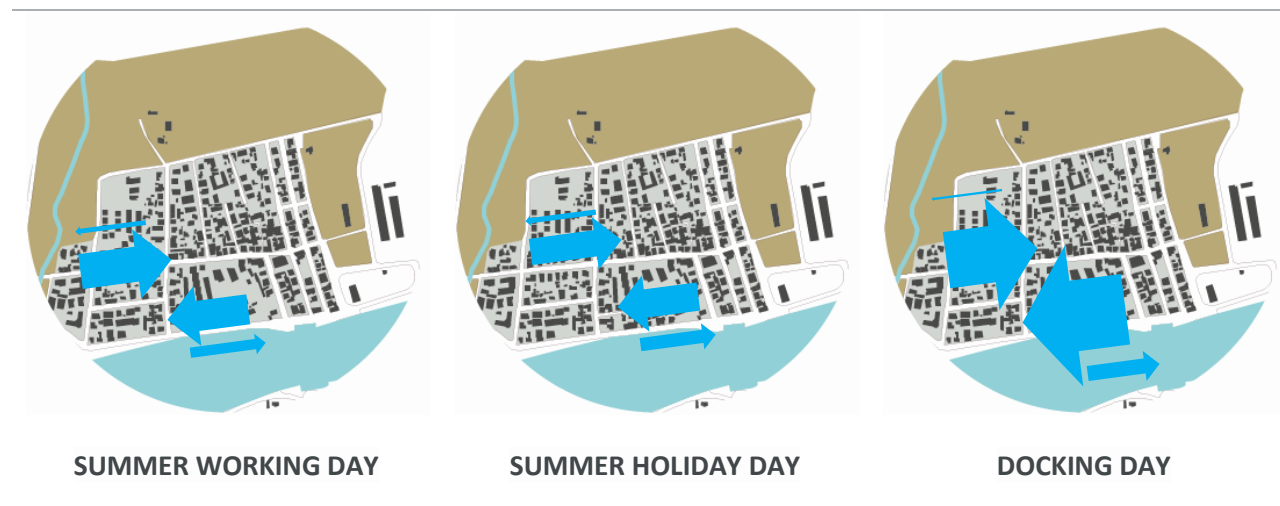


Figure 2: Infographic showing total vehicle traffic in Porto Corsini



3 Cruise-sector mid- to long-term (5 to 10 years) development trends

The growth trends of cruise flows at the port of Ravenna are not currently available and are unlikely to be made available, since they are commercial data of particular interest to industrial stakeholders. Given huge investments for the construction of the terminal, the Port Authority aims in the long run to reach 200,000 passengers per year. The Municipal Administration and the Port Authority are working to make the Ravenna cruise port the home-port of choice by ship owners, connecting the cruise terminal with the Marconi airport in Bologna, with which the Administration is already working to increase accessibility and connections with Ravenna. The possibility that Ravenna increasingly revisits the function of home-port is an opportunity not only for the terminal, but for the entire city, which could accommodate passengers for one or more days before or after the cruise experience.

4 Current cruise-related mobility and transport management policies and public & private initiatives addressing the existing flows.

► RAVENNA TERMINAL PASSEGGERI (RTP)

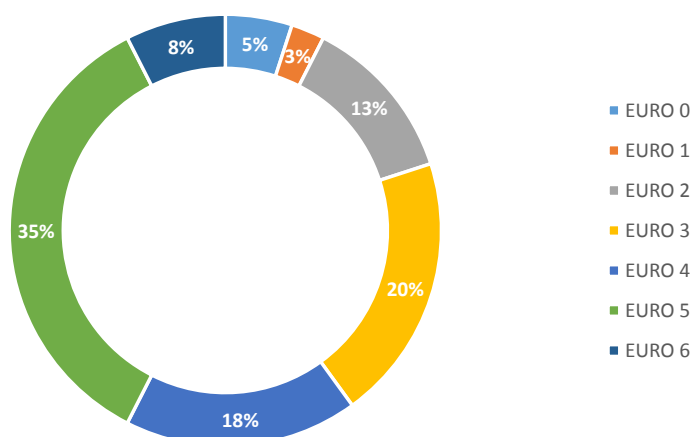
In 2009, the concession of the management of the maritime and boarding/deboarding and transit passenger services was awarded to RTP S.r.l. until 2019 through an RFP issued by the Port Authority in Ravenna.

Recently, the majority of the Company's shares were acquired by Global Ports Holding. Other shares are held by Aeroporto "Guglielmo Marconi" di Bologna S.p.A. and Venezia Terminal Passeggeri S.p.A. The new company structure does not have a local representation, previously guaranteed by the presence of the Chamber of Commerce, which is now no longer part of the concession company.

► TRANSPORT OPERATORS CONSORTIUM

In November 2001, the main transport operators of the province of Ravenna set up the METE consortium, thus forming a strategic alliance with the aim of creating management agreements and synergies, for the qualitative improvement and economic savings in the activity of members, though guaranteeing the basic autonomy of single members.

The company is the main operator engaged in transport operations for cruise passengers.



The graph represents the vehicle fleet of tourist buses of one of the main METE operators, considering only buses with more than 40 seats. To date, just over 20% of buses belong to a category equal to or lower than EURO 2.

► OTHER EUROPEAN PROJECTS

The passenger terminal area has been the subject of 3 European projects: “Adrimob”, Adriatic Multimodal System and EA SEA-WAY, “Europe-Adriatic SEA WAY”.

The first project, Adrimob, took place from February 2011 to October 2014; among the pilot actions implemented on the Passenger Terminal of Porto Corsini, those with the greatest impact on the mobility of cruise passengers are the following:

1. Informative and directional signage;
2. Free bike (16) rental point, near the terminal;
3. Passenger terminal Info Point.

At the end of the project, the bicycle rental service continued even though it was rarely used by cruise passengers, since the rental point is located in the camper area, far from the point of arrival.

The EA SEA-WAY project, active from November 2013 to autumn 2016, brought the following results:

1. construction of facilities to bring drinking water to the terminal;
2. installation of optical fibre;
3. activation of the bus connection between the terminal and the Ravenna railway station, for 2015 and until June 2016;
4. improvement of security measures thanks to the introduction of specific instrumentation

Once the shuttle service of the EA SEA-WAY project was completed, the transfer of cruise passengers was entrusted to the transport operators of the METE consortium company.



In the first half of 2018, Project MOSES began as the capitalization of EA SEA-WAY. The project aims to improve passenger mobility in the Adriatic area through the implementation of pilot actions aimed at introducing innovative services and maritime transport infrastructures.

5 List of negative impacts linked to cruise-related flows

The negative consequences of cruise tourism have been evaluated by stakeholders and can be summarized into the following key themes:

- absence of an official coordination table for cruise tourism stakeholders;
- congestion of tourist buses in Porto Corsini;
- poor exploitation of unconventional local tourist offer that is not linked to UNESCO monuments;
- lack of services in the passenger terminal;
- inadequacy of local public transport for cruise passengers;
- low development of bike trails at the service of cruise passengers;
- problem of accessibility for people with reduced mobility.

► STAKEHOLDERS COORDINATION TABLE

Several actors interviewed complained about the lack of a coordination entity for stakeholders involved in the organization of cruise tourism, underlining a lack of organization of the logistical aspects of areas affected by the presence of cruise passengers in the Ravenna area.

► CONGESTION OF TOURIST BUSES IN PORTO CORSINI

One of the main problems highlighted, due to the large size of buses in the small area of Porto Corsini, this situation causes a high level of stress in local residents. Furthermore, tourist buses are the main, yet only one of the elements causing saturation of the road network in the area at peak times. Porto Corsini is indeed additionally targeted by campers and daily visitors going to the local beach. To further enhance the inconvenience caused by the cruise tourists' transfers, are, according to local residents, the high speed of tourist buses and the continuous crossing of shuttle buses connecting the cruise terminal and Ravenna city centre throughout the day.

► POOR VALORIZATION OF UNCONVENTIONAL LOCAL TOURIST PRODUCTS AND SERVICES

Less cruise tourists are coming to Ravenna over recent years: they were more than 100.000 in 2011 and less than half in 2014, with a slight increase in the following years. The decrease may be due to a number of reasons (related to people's choices in relation to factors such as big cruise ships in Venice and the Costa Concordia disaster) and fall into the more general theme of the economic crisis affecting all ports.

The number of cruise passengers visiting Ravenna city centre has decreased, though, and there is a general perception - yet unconfirmed by data - that most tourist tend to visits other locations (San Marino, Bologna, Maranello) rather than Ravenna. Data show that Ravenna remains the main destination for cruise passengers, although the share of visitors moving to another location is increasing.

Among the reasons and missed opportunities:

- poor valorization of the city centre's UNESCO sites
- poor valorization of the opportunities offered by the territory surrounding the passengers terminal (Pialassa della Baiona, capanno Garibaldi, trails in the pinewood) of which cruise passengers remain unaware
- poor level of information for cruise passengers on opportunities and attractions offered by the territory
- absence of services for cruise passengers in Porto Corsini
- insufficient clarity and safety of pedestrian paths, including in the city centre
- absence of a Wi-Fi network in the whole territory

► LACK OF SERVICES IN THE PASSENGER TERMINAL

Among the main problems:

- the lack of shaded areas
- lack of an adequate information system
- absence of services for passengers

Although cruise liners' strategic choices are made in distant locations at international tables, the city council is determined to increase the destination's attractiveness and promote Ravenna internationally as a port of call to attract increasing numbers of cruise tourists

► INADEQUACY OF LOCAL PUBLIC TRANSPORT FOR CRUISE PASSENGERS

Among the main highlighted problems:

- insufficient number of taxis for cruise passengers
- inadequate local public transport service:
 - difficult to buy tickets (location of shops, opening times),
 - low frequency of service (competition with schools peak times)
 - low quality of buses

► LOW DEVELOPMENT OF BIKE TRAILS AT THE SERVICE OF CRUISE PASSENGERS

Cruise passengers are not often bike-friendly because of a number of reasons (cultural, health-related, etc.) and the distance between the passengers terminal and the city centre is such that only experienced users would choose this option. This notwithstanding, several cruise lines are already offering cycling tours and a development of cycling infrastructure would be highly beneficial not only for cruise passengers, but for all city users, including tourists and local residents.

Among the main problems highlighted:

- absence of a rental service by the passengers terminal (the existing service, free of charge, has a limited number of bicycles, is not clearly signaled and is far away from the terminal)
- low level of safety of available cycle paths connecting the passengers terminal with the rest of the territory

► PROBLEM OF ACCESSIBILITY FOR PEOPLE WITH REDUCED MOBILITY

The important issue of accessibility for people with reduced mobility is highlighted above all by tourism operators, as the proportion of passengers with different types of motor difficulties is significant. Cruises are reported to be the main way through which people with reduced mobility choose to travel; furthermore, tourists, including those in good health conditions, who choose cruises often wish to avail themselves of complete assistance as it pertains to issues concerning organization and planning. With this in mind, tour operators complain about the impossibility of parking near tourist sites in the historic centre, as well as lack of public restrooms.

6 Infrastructures and services for the mobility of cruise passengers

A tourist accessibility platform specifically dedicated to buses carrying cruise passengers has been set up in the historical centre of Ravenna, near the station on Viale Farini, in order to facilitate access to the historic centre. Other tourist buses for the embarking and disembarking of passengers must use the tourist accessibility platforms on Piazzale Aldo Moro or Piazza della Resistenza, which are located in a less central position than Viale Farini.

Cruise passengers use the following means to reach the historical centre of Ravenna:

1. Shuttle service managed by tour operators aboard ships

The shuttle service allows tourists to freely move between cruise terminal and historic centre (via Farini) without limits. The frequency of rides is contingent upon the size of the docked ship, and fluctuates between 10 and 20/30 minutes; the first ride becomes available about 30 minutes after docking, and the last one in time for the end of the boarding procedures. The service is carried out by 54-seat vehicles.

2. Excursion with tourist guide managed by tour operators aboard ships

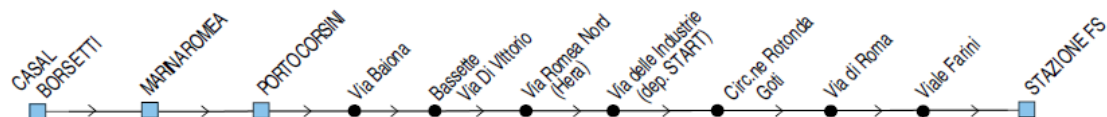
The service is carried out by 54-seat vehicles. The main destinations for excursions are Ravenna, San Marino, Maranello and Bologna.

3. Local public transport

Public transport line 90 connects Porto Corsini to Ravenna. However, the offer is limited, since the line was created for use by residents only. Alternatively, there are two lines with greater frequency from Marina di Ravenna - a place that can be reached by ferry.



Linea 90		Casal Borsetti → Marina Romea → Porto Corsini → Ravenna																							
		◆ START Romagna ◆																							
		✕ FERIALE																							
Zona	Località	●	§,%	3,5	●	1,4,5	●	●,§,£	@	●	●,§,@	£	1	§	@,4	&				4					
703	C.Borsetti v.le al Mare					06:38				08:22		11:20		12:35	13:35	14:30	15:20		16:38	18:20	18:53	19:57			
703	C.Borsetti Ciceruacchio					06:44								13:41											
703	M. Romea H. Meridiana					06:51			07:59	08:30		11:28		12:43	13:48	14:38	15:28		16:46	18:28	19:01	20:05			
703	M. Romea p.zza Italia					06:53			08:00	08:32		11:30		12:45	13:50	14:40	15:30		16:48	18:30	19:03	20:07			
703	Porto Corsini Traghetto					06:58			07:00			08:07	08:39		11:37		12:52	13:57	14:47	15:37		16:55	18:37	19:10	20:13
703	Stabilimento BUNGE																		16:28	17:03					
703	v. Baiona L.Trattaroli					07:04			07:06			08:13	08:45		11:43		12:58	14:03	14:53	15:43	16:28	17:06	18:43	19:16	20:19
703	Marcegaglia					07:05			07:07			08:14	08:46		11:44		12:59	14:04	14:54	15:44	16:29	17:07	18:44	19:17	20:20
700	Bassette v. di Vittorio					07:06			07:43	07:53	08:18	08:50	08:51	11:48		13:03	14:08	14:58	15:48		17:11	18:48	19:21		
700	Bassette CFP								07:55					12:55	13:05										
700	v. Romea Nord Hera					07:08			07:45	07:57	08:20	08:52	08:53	11:50		13:07	14:10	15:00	15:50		17:13	18:50	19:23		
700	v. Industrie dep. START	06:05	07:12	07:13	07:14	07:50	08:02	08:24	08:56	08:57	11:54			13:11	14:14	15:04	15:54	16:34		18:54	19:27	20:26			
700	Industrie-Chiav.Romea					07:16			08:04	08:26	08:58	08:59	11:56	13:02	13:13	14:16	15:06	15:56	16:36	17:18	18:56	19:29	20:28		
700	Ravenna FS	06:15	07:24	07:27	07:22	08:04	08:10	08:32	09:04	09:05	12:02	13:08	13:19	14:22	15:12	16:02	16:42	17:25	19:02	19:35	20:33				
§ = solo nei gg. di Scuola		@ = non si effettua il Sabato										£ = nei gg. di Scuola transita CFP escluso Sabato													
& = transita stabilimento BUNGE escluso Sabato		● = corsa della Linea 2										% = transita Vill. S. Giuseppe (7:21)													
1 = transita via Ciceruacchio		3 = parte da via Volano (6:56)										4 = non transita Bassette													
5 = prolungata Ravenna p.zza Caduti																									



2.1.2 SWOT Analysis

STRENGTHS

- Project partnership
- Integration of LCTP in Ravenna SUMP
- The development of Ravenna Cruise Terminal has been treated by other European projects
- Due to the small dimension of Porto Corsini – a little more than 1500 inhabitants – it is possible to customize actions and mitigations.
- Shuttle busses from the cruise terminal have a special bus stop in the city center
- 8 UNESCO monuments as important tourist attractions

WEAKNESS

- Few facilities at the Cruise Terminal
- Distance between the Cruise Terminal, in Porto Corsini, and the historic center of Ravenna (20-25 min. by bus)
- Poor development of cycle infrastructure and related facilities oriented to cruisers
- Limited extension of Porto Corsini road network
- The presence of various seasonal tourism attractions in Porto Corsini – each one with its own related traffic – increase the citizens' discomfort
- Ravenna is a commercial port: the evocative idea of using the Candiano Canal to reach the city dock and, from there, the city center present some relevant difficulties
- The cruise terminal and the city center are separated by the main industrial area of the Municipality (chemical, petrochemical, metallurgical industries)

OPPORTUNITIES

- The development of a golf course in the near center of Casalborsetti (Municipality of Ravenna) is foreseen by the master plan
- It is possible to reach the beaches on foot from the cruise terminal
- Naturalistic attractions close to the cruise terminal
- Development of a LNG storage and distribution network in the port of Ravenna
- Industrial research project to powered with GNL the Porto Corsini –Marina di Ravenna ferry
- Financing of the city dock area

THREATS

- Fluctuating flow of cruise passengers in Ravenna
- Public Administration and Port Authority haven't any possibility to act on the itineraries chosen by the cruise companies
- A relevant part of cruisers is not environmental-friendly
- The tourism flow generated by cruises is not enough to justify new dedicated infrastructures
- It is difficult to realize new roads near the terminal due to its proximity to a naturalistic protected area (pinewood)

A focus is needed to clarify the main constraints that hinder, at least in the short term, new connections by sea or the construction of new infrastructures. In the collective imagination of many Ravenna citizens, there is the idea of sea cruisers landing in the city Dock, a space abutting the historic center that could partially solve the problem of the cruise passengers' transfer from Porto Corsini to Ravenna. Keeping in mind that the depth of seabeds would not allow the arrival of cruises up to the Dock head, this solution would be feasible with fast motorboats for transporting passengers from Porto Corsini to Ravenna, along the Candiano canal.

At the moment, the absence of direct connection between the Dock - the point of arrival of ships - and the historical center due to the presence of the railway line is a critical issue that cannot be neglected. The aspect of the feasibility of the maritime connection should also be considered. According to the “Regulations for navigation, parking, transit and right of way of ships and boats in the port of Ravenna”, the maximum speed allowed in the Candiano canal is 6 knots, about 11 km per hour. At present, navigation from the cruise terminal pier to the city dock would take more than 60 minutes. Moreover, boats must give priority to all commercial ships, pursuant to Art. 25 of the Regulations. At present, it is therefore considered difficult to implement these new connections right away, but it is undeniable that in the medium and long term period they could be part of the solution to the problem of traffic congestion in Porto Corsini.

Another possibility that is proposed as an answer to the reduction of vehicular traffic linked to the transfer of cruise passengers concerns the construction of a new infrastructure specifically dedicated to the terminal to connect it directly with the main access route to Ravenna. However, this solution involves crossing the SIC IT4070005 area “Pinewoods (Pineta) of Casalborsetti, Pineta Staggioni, Duna di Porto Corsini”. The pine forest is part of the Natura 2000 sites, where interventions, activities and works that may compromise the protection of protected natural environments are forbidden, with particular regard to flora, fauna and habitats of EU interest protected under Directives n. 92/43/EEC.

2.2 Step 2: Participatory process

1 Stakeholders identification

The Plan was developed as part of a broadly participated process, in which several actors were involved from the early stages of analysis. Indeed, cruise tourism includes a series of issues, in addition to transport, which could not be left behind in the preparation of the Plan and for which it was necessary to involve sector operators and stakeholders, who also hold information and data which otherwise would not have been possible to access.

The process of identifying stakeholders began from the work done during the kick-off meeting with other partners of Project LOCATIONS, and was integrated during the first phase of the participatory process. Previously considered or partially considered issues emerged during the course of a variety of meetings, which is why we constantly supplemented the list of actors to be involved. On the basis of our meetings, a stakeholder “interest vs. power” matrix was developed for the purpose of classifying their relevance in the development of the Plan. The matrix classifies stakeholders according to their power and interest, rather than in terms of their nature, in relation to results that the Plan aims to achieve.

It should be noted that it was not possible to involve all stakeholders from the early stages of the project. Specifically, the Po Delta Park Authority, the State Forestry Corps and the Superintendence were subsequently involved in obtaining suggestions and opinions in relation to specific actions that required their suggestions and the issue of opinions.

POWER	HIGH	Emilia Romagna Region Stakeholder representative associations (crafts and trades) Heritage Agency Delta Po Natural Park Agency Ranger	Tour operators Ravenna Port Authority Ravenna Passengers Terminal
	LOW	Province of Ravenna Cruisers	Environment protection associations Cycling associations Tourist guides Transport operators Beach resorts operators Local Committee for the Seaside Area and Local Development of Porto Corsini
		LOW	HIGH
INTEREST			

Given the plurality and diversification of players involved, it became necessary to structure the participatory process at different times, involving specific stakeholders in a different way. Among those identified, we can distinguish two types of actors:

1. Institutional or representative stakeholders representing an institution or group of people who are interested in the mobility of cruise passengers
2. Individual subjects who are directly affected by the Plan, namely, cruise passengers and citizens of Ravenna.

2 Process design

The participatory path has been structured in two phases.

► STEP 1 PARTICIPATORY PROCESS WITH REPRESENTATIVE STAKEHOLDERS

Representative stakeholders have been involved in three different moments:

- I. A first phase of analysis, during which **focus groups** or **face-to-face meetings** were held. Stakeholders were separately invited to some meetings in order to collect what were deemed issues of **critical importance** regarding the transfer of cruise passengers. The **focus group** mode was chosen to allow each actor expressing his or her opinion, thus preventing some subjects from prevailing over others and shifting attention only on certain problems. Furthermore, especially for tourism sector operators, the confidentiality of information and data regarding cruise tourism is of fundamental importance; it was therefore necessary to provide a confidential and favourable environment for dialogue.
- II. In the second phase, in which the roles of various stakeholders became clearer, a variety of actors were brought together in groups based on the interest-power matrix. Actors with high interest and low power met in an initial meeting; a second meeting was held with stakeholders with high power

and low interest and a third gathering was reserved for actors with high power and high interest. During the **first two meetings**, the first part was dedicated to the presentation of cruise tourism in and around Ravenna, as well as of main constraints in short- and long-term opportunities. After building a **common knowledge base**, the stakeholders with low power/high interest and high power/low interest were invited to assign a **priority** to a set of actions and objectives that had been formulated in the analysis phase. The evaluation was completed on the basis of a 1 to 5 scale, according to the following system

1 scarcely important	to be considered possibly only in the long term (10 years)
2 important, can be postponed	to be considered for sure in the long term (10 years)
3 important	to be implemented in the medium term (5 years)
4 very important	to be implemented in the short term (2 years)
5 priority	to be implemented as soon as possible

All actors were invited to raise issues and topics not included in the themes proposed by the Municipality of Ravenna.

Hypotheses discussed with other stakeholders were presented in a subsequent interview with high-power/high-interest actors, outlining operational hypotheses required to put in place high-priority actions.

- III. After drawing up an LCTP draft, stakeholders were once again involved in a single meeting to gather any observations and further opportunities for developing the Plan..

► STEP 2 – PARTICIPATORY PROCESS WITH SINGLE SUBJECTS

Another phase of the participatory process included the direct participation of individual subjects. Cruise passengers and citizens of Porto Corsini were involved in this process.

As end users, cruise passengers were interviewed during the last 2017 docking in Ravenna, and were asked to respond to a questionnaire to assess the quality of mobility services from the terminal to the city, as to allow understanding what deficiencies are most perceived by cruise tourists.

The citizens of Porto Corsini, as people more directly interested in the effects of the mobility of cruise passengers, were directly involved in a process that accompanied the development of a Detailed Traffic Plan, which, taking account of sustainable mobility, aims to define works that can be implemented in the short/medium term to improve pedestrian and cycle mobility, accessibility, road safety, as well as parking and vehicular traffic.

A claim and a dedicated logo were created for the citizen involvement path, which accompanied the entire process, from the analysis to the evaluation phases of scenarios, and to final design.



The activities related to the participatory process with the citizens of Porto Corsini took place at different times:

1. an initial meeting structured as a “group interview” to so-called “opinion leaders”, namely, some people (less than ten in total) who, by role and/or activities carried out in the hamlet, have a bird’s eye view of problems at hand and are able to convey the perception of part of local residents and economic operators;
2. a public meeting open to all interested parties. In the first part the local population was informed of the objectives of the LCTP, while in the second critical issues had been collected through the “geotagging” technique. Prior to the meeting, 6 categories of critical issues were identified, with a symbol being associated to each one of them. Each participant was provided with stickers with the six symbols representing the critical categories. Everyone was asked to identify critical issues by affixing stickers on a large printed aerial photograph. Moreover, through the distribution of A4 size “mute” floor plans of the location, it was possible to identify and mark additional points and critical sections related to issues that are meant to be addressed by Plan tools. Finally, some initial roadmap proposals were collected, ensuring that, at a later point, the results of reports could be identified and discussed in a collegial environment;
3. the publication of an on-line questionnaire addressed to the Porto Corsini residents, aimed at getting to know basic mobility habits, gathering summary opinions on some issues concerning local mobility and traffic patterns, as well as opinions and more structured proposals
4. a public meeting focused on informing citizens about “traffic-calming” strategies, on the measures that can be implemented in Porto Corsini and on the comparison between the different possibilities and implications of each, integrating technical aspects with suggestions and observations made by residents;

5. a final meeting in which the Plan proposal was submitted to residents; the proposal was formulated on the basis of contributions by locals, as well as contacts entertained with entities involved, and includes works that can be largely anticipated by reversible and low-cost experiments which can provide suggestions and serve as references for the future.



3 Results of the participatory process

► STEP 1 PARTICIPATORY PROCESS WITH REPRESENTATIVE STAKEHOLDERS

The analysis of the critical issues that emerged from the stakeholders during the focus groups is reported in detail in paragraph “List of negative impacts linked to cruise flows”. A system of different priorities for the actions and strategies of the Plan, depending on the type of stakeholder considered, has emerged during the identification of solutions, even if the tables identify priorities that are shared by the two groups of actors.

What all the representative stakeholders consider as priority is the enhancement of local tourism offer in order to increase the positive impact of cruise tourism in the area, and the reduction of the length of routes to reach the excursion destinations, thus encouraging the use of sustainable mobility (bike and feet).

For other strategies, however, we can notice a certain difference in the allocation of priority by stakeholders: if high-interest/low-power stakeholders consider the other three strategies as priorities or, in any case, important, those with low-interest/high-power consider important, though not a priority, the improvement of the environmental quality of Porto Corsini, while they consider the other two strategies achievable only in the long term.

SPECIFIC OBJECTIVES	PRIORITY High Interest – Low Power	PRIORITY Low Interest – High Power
ENHANCMENT OF LOCAL TOURIST OFFER	4.4	4.1
IMPROVEMENT OF ENVIRONMENTAL QUALITY IN PORTO CORSINI	4.3	3.25
REDUCTION OF POLLUTANT EMISSIONS PRODUCED BY COACHES USED FOR CRUISE PASSENGERS	3.9	2.1
DEVELOPMENT OF NEW MODES OF TRANSPORT FOR CRUISE PASSENGERS	3.8	2.2

Tabella 2: Le priorità delle strategie secondo gli stakeholders

ACTIONS	PRIORITY	PRIORITY
	High Interest – Low Power	Low Interest – High Power
Increase low carbon tourist offer for cruise passengers	4.8	3.7
Wayfinding for cruise passengers (and tourists)	4.7	3.7
New bike paths	4.6	3.7
Improve accessibility to POI for people with reduced mobility	4.5	4.7
Create an official coordination table for cruise tourism stakeholders	4.5	4.7
30 km Zone areas	4.4	1.7
Urban requalification in Porto Corsini	4.4	4.0
Limitation of circulation to polluting vehicles	4.3	2.3
New road schemes	4.2	3.0
Low carbon bus for cruise passengers (LNG or electric)	4.2	3.3
Works in the historic centre for the regulation of bus transit and walking accessibility	3.7	3.3
Cruise passengers' bus flow management	3.1	2.7
Offrire nuove opportunità di spostamento a basso impatto ambientale ai crocieristi	2.2	2.3

Tabella 3: Le priorità delle azioni secondo gli stakeholders

Delving into details that concern actions, high-interest/low-power actors consider the expansion of tourist offer and interventions to support cycling and pedestrian mobility as a priority. Low-interest/high-power stakeholders, while considering these very important actions, also highlight the urgent need to institutionalize a coordination table related to the mobility of cruise passengers. All actors involved in the participatory process recognize the urgency of improving accessibility for people with reduced mobility.

► STEP 2 – PARTICIPATORY PROCESS WITH SINGLE SUBJECTS

Cruise passengers were interviewed on the occasion of the last 2017 cruise call, on 25/11/2017. For a correct interpretation of the results, it must be emphasized that cruise passengers travelling during this season tend to be older and with greater financial resources. 71 cruise passengers were surveyed, an amount equal to about 60% of those who visited Ravenna.

This number mostly includes couples aged between 60 and 80. Approximately 30% of cruise passengers interviewed claimed to be a person with reduced mobility. In general, the assessment of the quality of the transfer is perceived positively, as the level of accessibility is considered good enough even among people with reduced mobility. Among those who consider the quality of the transfer to be inadequate, there is evidence of 40% complaints about lack of information, and an additional 30% does not provide information about the assessment and probably complains about the absence of public toilets as reported by the technicians of the Municipality of Ravenna, who distributed the questionnaire. The availability of different modes of transport in the city has been assessed as important by about 70% of respondents.

Regarding the engagement with citizens, the geotagging activity carried out during the public assembly has allowed identifying with a certain precision the critical issues known to citizens. The photo taken of the aerial picture at the end of the evening, used as a working base, shows where participants affixed stickers. From the picture it emerges; in particular, the density of reports on the three axes of via Po, via Molo San Filippo and via Guizzetti.

The questionnaire dedicated to Porto Corsini residents was published on the website of the Municipality of Ravenna and on the Facebook page "PUMS Città di Ravenna", on 11 December, 2017 and launched publicly during the meeting with citizens. 75 surveys were completed. Below are the main elements emerged, presented with the support of tables and graphs. The questionnaire was mostly compiled by people over the age of 60, although there is also a good participation of people between the ages of 41 and 60, with a prevalence of female participation (41) compared to men (34). Most of the questionnaires came from workers (64%) and retirees (17%).

As it will emerge from the attention paid to the slow mobility of Porto Corsini, many of the inhabitants who have filled out the questionnaire usually use the bicycle (40%), a number that surpasses standard car drivers (37%) and that is added to those who routinely move on foot (20%). Buses and motorbikes-scooters are scarcely used. It should be noted that the question asked to indicate the transport means used mainly to move within Porto Corsini. The dedicated table, which details data for the different occupations declared, also shows how the car becomes the preferred vehicle for workers.

When asked about the perception of safety when moving on roads and pedestrian and cycle paths of Porto Corsini, 71% responded negatively. In 70% of cases, the reasons for scarce safety are due to absence or lack (small size, poor maintenance, poor functionality, discontinuity, etc.) of both pedestrian and bike trails

In the second part of the questionnaire, citizens expressed themselves on a number of issues concerning mobility, evaluating them according to a 1 (very negative) to 5 (very positive) scale. In general, it is noticeable that no aspect of mobility reaches weighed average feedback above 3 and that all average ratings are rather flat on values between 2 and 3. Road (and car trips) and walking routes get the best reviews (at least in terms of the number of positive reviews between 4 and 5). Stops, cruise passenger flows, cycling and mobility of children are the central block of the ranking. On the other hand, ferry (which receives the highest number of 1s), architectural barriers and mobility of the elderly receive the most negative judgement.

Finally, when asked about the importance and priority that the Plan should assign to certain strategic issues, citizens responded in a clearer way, identifying the two most relevant issues (both indicated by 83% of completed questionnaires) in the improvement of routes and safety for pedestrians and bicycles. 60% to 65% of citizens confirmed their consensus on improvement of the quality of public space, reduction of vehicle speed and mitigation of impacts related to the transit of cruise passengers' buses. The improvement of the

cruise terminal area and of public transport stops are considered important and priority by a number of around 50% of the completed questionnaires.

The second public assembly was divided into two closely related moments: a first portion included the presentation of the results of the online questionnaire and the geotagging activity; a second portion discussed principles and techniques of so-called “traffic calming” strategies, as a crucial element of response to problems raised. The presentation featured a practical approach, with application examples within the town of Porto Corsini and comparison of different possibilities. Citizens were provided examples of local realities in order to facilitate the understanding of possible actions: participants expressed their preferences regarding proposed solutions, as well as suggested modifications and additions.

The final meeting - the presentation of the plan proposal - constituted the moment of synthesis of the path taken. Project tables, not yet final, of the main themes were presented and hung to facilitate the understanding of the proposed interventions.



Principles of sustainability, accessibility and security were integrated with those of flexibility, feasibility for parts, experimentability and reversibility. Some of the proposed actions can be tested even in the short term, in a reversible way and at low cost.

It is important to highlight that actions envisaged in the plan, as well as self-consistent, can be the basis for further future actions in favour of the quality of the town of Porto Corsini, both in terms of mobility and urban life.

2.3 Step 3: Design of the plan

The Plan proposal includes three strategies that have been articulated according to a set of actions. For each action, we identified financial costs that consider costs that the public body or other subjects involved must foresee for the implementation of the activity.

An external consultant drafted a Detailed Plan and implemented a participatory process with the residents of Porto Corsini and a wayfinding draft plan aimed at promoting low-carbon transfers from the cruise terminal to points of interest near the terminal.

1 The current scenario

On the basis of the information reported in the previous chapters, the current scenario of the mobility of cruise passengers on the ground is summarized here:

- about 50,000 cruise passengers per year;
- the bus is the only mode of transport available to cruise passengers;
- 40% of buses belong to a category equal to or better than EURO 3;
- during disembarkation days, there is a 45% increase in heavy traffic at Porto Corsini;
- Cruise passengers with reduced mobility have difficulties in moving about the municipal territory.

The most urgent problems of the current scenario are the following:

- Porto Corsini residents have to reckon with a considerable increase in heavy traffic during the disembarkation days;
- Porto Corsini residents perceive only the negative impacts of cruise tourism;
- stakeholders report the poor enhancement of tourist attractions near the cruise terminal;

2 Vision and objectives

► VISION

The Municipality of Ravenna aims to become one of the reference destinations for the sustainable mobility of cruise passengers in the Mediterranean area. Specifically, the City aims to excel in the issue of accessibility to ensure everyone the opportunity to move in a sustainable manner in the port and in Ravenna with the least possible number of architectural barriers.

This goal is part of the commitment of the whole city on the issues of accessibility and elimination of architectural barriers. At the beginning of 2018, the Municipality of Ravenna approved the Urban Accessibility Plan (PAU) aimed at creating safe and accessible pedestrian paths for everyone and achieving greater social inclusion and integration of all people in the field of mobility.

The vision of the LCTP also falls within the strategic objectives of the Urban Plan for Sustainable Mobility (SUMP) of the city of Ravenna and, more in general, the perspective of improving the quality of life of all citizens.

► OBJECTIVES

As part of the overall objective of LOCATIONS project, the LCTP of the Municipality of Ravenna aims to reduce adverse impacts resulting from the shifts to land of cruise passengers, and seek solutions to maximize the opportunities for developing sustainable transport modes for cruise tourism. The position of the passenger

terminal and the uniqueness of the Ravenna canal port must become a force factor on which to focus for the purpose of offering cruise passengers sustainable transport opportunities that have tangible and measurable repercussions on the town of Ravenna.

3 Actions and indicators

To achieve the general objectives that the Municipality of Ravenna is pursuing within the framework of the LCTP, three strategies have been defined and shared with stakeholders. In this regard, we must make a clarification: the questionnaire given to stakeholders listed four strategies. In the course of the project, the in-depth study of topics at hand led to a better definition of strategies: the objectives identified were traced back to basic actions, which, in turn, were grouped into macro-areas on the basis of themes and coherence. The result led to the definition of the “new” strategies.

“The decrease in the emissions of vehicles transporting cruise passengers”, being in fact a very precise activity, has been brought back within a broader strategy - *to improve the environmental quality of connections between the cruise terminal and the centre of Ravenna.*

We decided to develop a Plan that includes feasible actions, trying to overcome scepticism of citizens and stakeholders that in previous year were shown high-cost projects that were never realized. LCTP is a Plan integrated with other territorial and urban plans already approved(or being-approved) by the Municipality or other Public Bodies. For this reason, actions included in LCTP do not need to get special permissions (as Environmental Impact Assessment or other authorization) with long and complicated process and not certain results.

STRATEGY 1 | IMPROVING TOURIST ACCESSIBILITY TO POINTS OF INTEREST IN THE PROXIMITY OF THE TERMINAL

The improvement of the local tourist offer, especially referred to the naturalistic areas near the terminal tend to decrease distances travelled by cruise passengers on land with the double effect of reducing emissions produced by road trips and incentivizing more sustainable modes of transports, such as cycling, as these destinations become more attractive to cruise passengers.

Objectives

- To increase the level of accessibility, also for people with reduced mobility, of tourist destinations near the cruise terminal;
- To create the basis for the development of low-carbon local economies that have the main objective of enhancing tourist destinations near the terminal

Actions

1.1 Improvement of accessibility to points of interest near the cruise terminal - the Municipality of Ravenna aims to improve routes to reach tourist destinations in the vicinity of the terminal. First of all, together with the main stakeholders, we identified the main tourist destinations that could be enhanced in the immediate vicinity of the cruise terminal, and, in broader strokes, we assessed the accessibility to identified points of interest, as well as the feasibility of any necessary work in this regard. We then identified the following actions to increase the level of accessibility of the following points of interest:

- **Isola degli Spinaroni:** construction of a bike trail from the entrance of Porto Corsini to the embarkation point to the island of Spinaroni and a small parking area for small vehicles - table 1.1
- **Capanno Garibaldi** - construction of a bike trail, sometimes within mixed use areas, from Porto Corsini to the access bridge to Capanno Garibaldi - table 1.1
- **Beach resorts and Diga Foranea (Breakwater):** as part of the new project of the Porto Corsini harbour, the Municipality of Ravenna has requested Port Authority to create a pedestrian route from the maritime station to the bathing establishments and the breakwater

Indicators	Source
km of bike paths from cruise terminal	Municipality of Ravenna Port Authority
# points of interests 5 km far from cruise terminal accessible for cyclists and pedestrians	
# of cruise passengers visiting points of interest near cruise terminal	
# bikes available for cruise passengers	
# of cruisers using bikes	

1.2 Cycle and pedestrian signage system - The LCTP also includes a wayfinding draft plan designed to foster cycling for cruise passengers. One of the preliminary operations for the precise definition of individual signage systems and information posts concerned the identification of sites of interest and attraction centres to be marked by signage, which involved representatives of the Porto Corsini, Marina Romea and Casalborgorsetti Pro Loco offices. The elements chosen to be marked by signage can be distinguished in two macro categories:

- services and attraction centres;
- sites of scenic/naturalistic interest.

Each of these elements was assigned an icon, so as to report information in signage, as necessary and in the most concise way possible.

The wayfinding system includes two types of signals:

1 Four-sides totem with information about points of interests and the entire cycle network related to cruise terminal. These totems have been designed to be read and consulted in stop and non-transit mode. They are structured as four-sided parallelepipeds. There are two types of posts, with similar graphics and characteristics, being aimed primarily at cruise passengers; their contents, however differ, since they are installed on the basis of two different contexts: Porto Corsini and Ravenna. Totems informing tourists about the main tourist sites of the coastal towns of Porto Corsini, Marina Romea and Casalborgorsetti and of the bike trail system of the Lidi Nord area will be installed in two or three “noticeable locations” in the town of Porto Corsini, in proximity of the network of slow-mobility trails. A single totem focusing on the historic centre of Ravenna, designed to facilitate walking on foot to reach the main attractions of the capital, will be installed on Viale Farini, at the tourist accessibility platform dedicated to cruise passengers. As the previous one, it includes four sides with the following features.

2 Signals with tables guiding cyclists on the most suitable routes to reach certain attraction centres and the main sites of scenic and naturalistic attraction. Existence and features of marked routes were verified through specific inspections. Therefore, they are positioned, in general, where cyclists come across a fork or at intersections along trails connecting to a variety of sites of interest. In some cases, these signals univocally identify the direction to be followed; in others, they allow choosing alternative trails to reach the same destination through paths of different length. For the most important sites, we estimated distances in minutes, assuming an average ride speed of 12 km/h. This is a medium-low speed, acceptable even for occasional cyclists, and which generally also takes into account possible short stops along the way. The coloured dots that point to four recommended routes with departure from and arrival at Porto Corsini provide additional information on the choice of routes represented and briefly described in information posts. For the design of directional tables, we made reference to the Coordinated Image Handbook of the Emilia-Romagna Region concerning protected areas and Natura 2000 sites and to what is set forth in the Traffic Code.

We have planned for the supply and installation of 59 points and 199 directional tables. Each plant is made up of a tubular support pole with a diameter between 48-60 mm, to which, using the appropriate brackets, are anchored various signage tables in 10/10 extruded iron sheet measuring 1000x200 mm. The base on which each system must be installed, for which a plinth of the approximate dimensions of 50x50x50 cm should be provided, is to be verified. Totems must be constructed using structural methods, materials and types of digital printing that guarantee high resistance to atmospheric agents and UV protection, with

particular regard to those to be installed in the Porto Corsini area, close to the sea. Each face of the post has a height of 200 mm and a width of 80 mm. Totems will be anchored to the ground to a foundation plinth of adequate size or with a concrete block placed inside it, in case the need arises to change the installation location.

Indicators	Source
# of signals installed	Municipality of Ravenna

1.3 Activation of a new service of e-bike rent (MOSES project)

The MOSES project and in agreement with RTP, will launch a pilot installing an equipped container containing pedal-assisted bicycles, cycles without power and a small space for maintenance. E-bikes will be equipped with GPS detectors and distributed free of charge to cruise passengers, who will be able to follow the marked naturalistic and urban routes: the presence of GPS equipment will make it possible to track preferences and distances travelled, and support choices regarding the future location of charging stations. The experimentation will start in June 2018 and end in 2019. Municipality of Ravenna helped MOSES Ravenna partners in the procedure for identifying the criteria for the purchase of pedal-assisted bicycles, requiring the presence of a bicycle dedicated to the transportation of people with reduced mobility.

Indicators	Source
# e-bikes available for cruise passengers	Municipality of Ravenna
Average bike rent rate	Port Authority

STRATEGY 2 | IMPROVING URBAN QUALITY IN PORTO CORSINI

Description

The improvement of urban quality in Porto Corsini, the area most affected by the negative effects of cruise tourism, will result, on the one hand, in actions aimed at improving accessibility and usability of cycling and pedestrian routes, and, on the other hand, increasing the quality of public spaces to compensate for inconvenience caused by the inevitable passage of buses in the town of Porto Corsini.

Objectives

- To reduce heavy traffic in the centre of Porto Corsini
- To improve the quality of the public spaces of Porto Corsini to mitigate the negative impacts caused by the traffic of cruise tourism;
- To increase the attractiveness of the centre.

Actions

2.1 Implementation of interventions foreseen by the Detailed Urban Traffic Plan of Porto Corsini - A Detailed Traffic Plan has been developed in order to reach the following goals:

1. reduction of the adverse effects caused by the transit of buses in the town of Porto Corsini,
2. improvement of safety conditions, especially for users with challenges, and the urban quality of the Via Po axis.

In responding to the critical issues related to the impact of cruise traffic in Porto Corsini, the Detailed Urban Traffic Plan aims to outline a series of works that can lead to a stable improvement in the liveability and safety of the centre's public spaces

Porto Corsini at 30 km/h

The residential centre of Porto Corsini becomes a single "30 Zone". Speed reduction is not to be understood as the mere imposition of a speed limit enshrined by the installation of special vertical signs, but as the adoption of an approach to the way of treating roads not as "corridors for motor vehicles", but, rather, as spaces where to carefully preserve the needs and security of users with challenges and provide for slow pedestrian and cycle mobility. Reducing the speed limit, along with traffic moderation techniques, will improve safety on all roads and mitigate the impact of vehicular traffic on atmospheric and acoustic pollution. The lengthening of travel times in the town is relative: if in a free-flowing network, the speed differential would lead to an increase of the time of about 40 sec to cross the 900 m that separate the entry junction on via Baiona and Capitaneria di Porto, reality shows how the interference with lateral flows and pedestrian crossings, as well as speed maintained on the trails within the centre greatly reduce the theoretical result of the count.

Internal bike trails and trail connections with the area.

Bringing residents and tourists to cycle easily and safely in Porto Corsini is the PPTU's goal. The establishment of the "30 Zone" and, as we will see, some "residential streets" with appropriate works, is already in itself a provision that leads to a rebalancing in the use of the road in favour of the bicycle.

Accessibility and usability of pedestrian paths.

The poor quality of the network of pedestrian paths emerges especially in some streets. The identification of “residential areas” can offer a “non-infrastructural” response to the problem. In other cases, on roads affected by major traffic flows, the construction from scratch or re-sizing of sidewalks according to laws in force governing the elimination of architectural barriers are identified as priority actions. This is the case of Via Guizzetti and Via Sirotti, where the already reduced sidewalks are even more unserviceable due to the presence of public lighting poles, and the western part of Via Molo San Filippo.



Accessibility and usability of bike trails

The idea prevails in Porto Corsini that bicycles can move freely and safely in the roadway, along with vehicles and on all roads, thanks to the establishment of an extended 30 Zone.

In some cases, it is necessary or advisable to create dedicated routes, as in the case of the trails of via Po and via Guizzetti - which allow bikes to move even in the opposite direction to that of motor vehicles - or in bike trails or bike/pedestrian trails connecting local beaches and the port (beaches, earth dam, cruise terminal and ferry dock for Marina di Ravenna) to Via Baiona and the rest of the network of local bike trails.

Table project in annex shows some moderate road traffic connections that complete the idea of “network” which we sought to make the system of the routes of Porto Corsini clear. That is how via Valle Giralda and via Volano, for example, despite the lack of space to create dedicated bike trails, should be seen as fundamental connections for the development of local cycling.

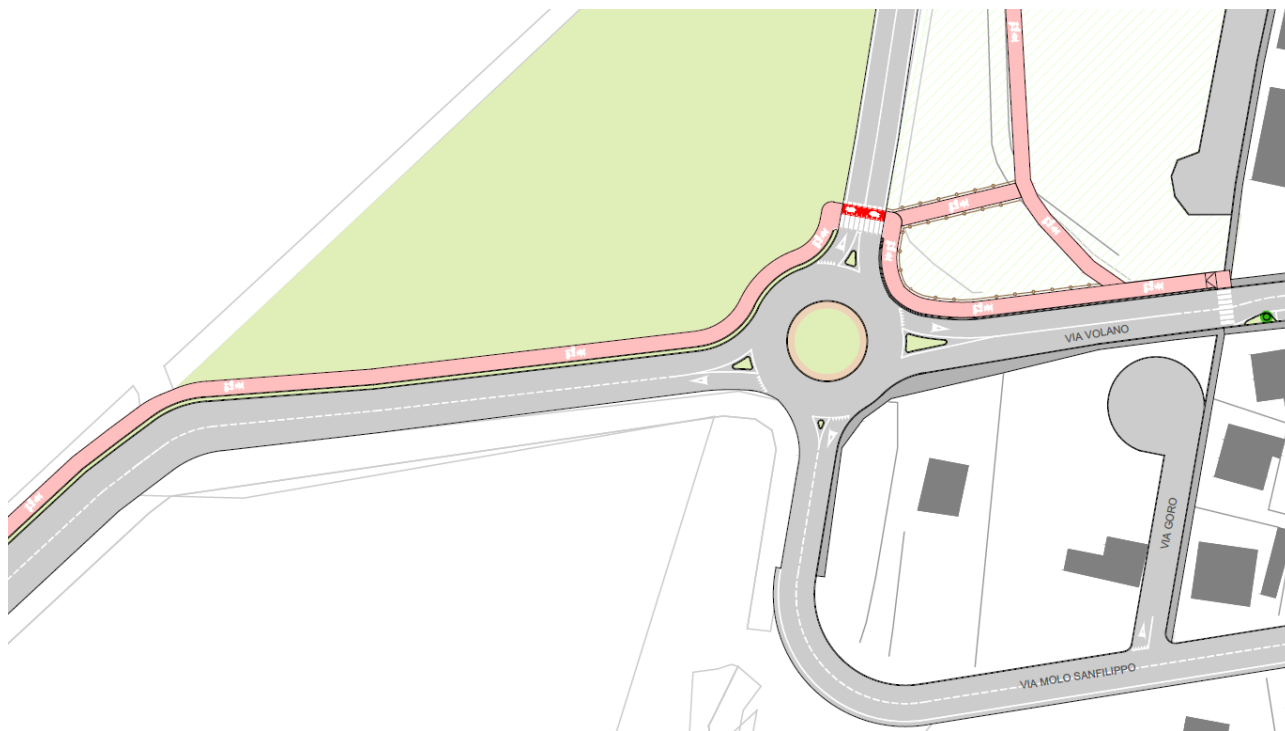
Through the wayfinding system described above, cyclists are addressed preferentially in the area surrounding Porto Corsini to the following trails:

- cycle-pedestrian route along Via Baiona, towards Marina Romea and Casalborsetti;
- the bike path that, running alongside the “Cavallo Felice” stables, allows quickly reaching Pialassa Baiona, transiting through the pine forest at the drain point, and via Valle Giralda;
- the trail through the pine forest that starts from the intersection between via Guizzetti and via Sirotti, crossing northwards all the access roads to the sea.

“Safe nodes” works

Along the local road network some intersections have been identified on which to intervene to improve the general conditions of safety. The safety of the intersections responds, in the first place, to the need to reduce risk factors, but is also addressed as an opportunity for redevelopment of public space and improvement of connections between pedestrian and bike trails.

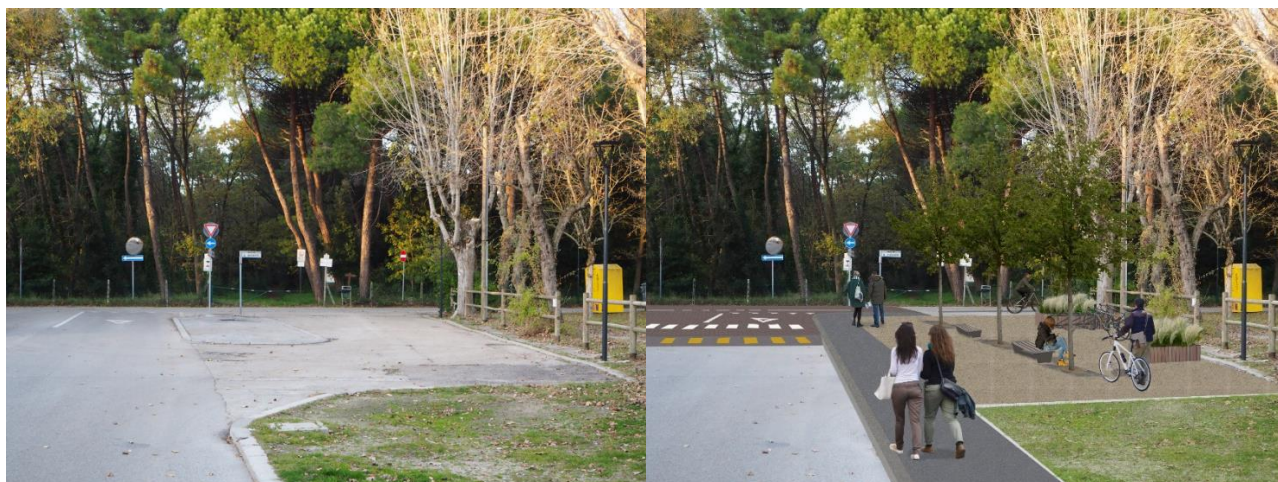
At the town entrance, the junction between Via Baiona and Via Volano can be revisited with the construction of a roundabout functioning as a speed mitigator and “gateway” to Porto Corsini.



At the intersections of via Cottino, that cuts the town in half, with via Guizzetti, via Volano and via Molo San Filippo, we propose to carry out works reminding drivers the level of attention to be paid behind the wheels.



At the two ends of Via Sirotti, we plan to reorganize intersections along with the creation of bike and pedestrian trails and crossings, as well as the redevelopment of spaces adjacent to the roadway and, in the case of the ferry berth to the south, improve the current connection viability.



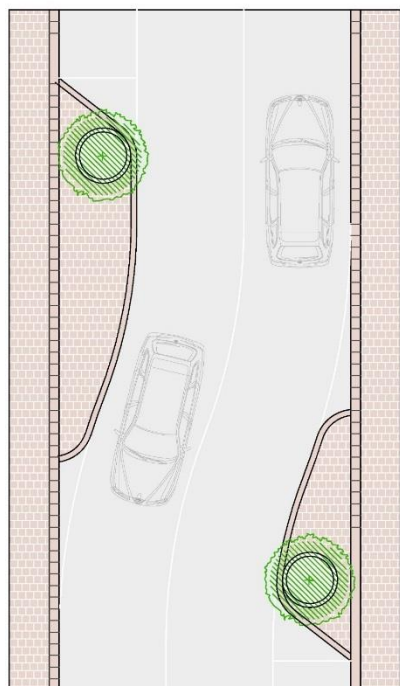
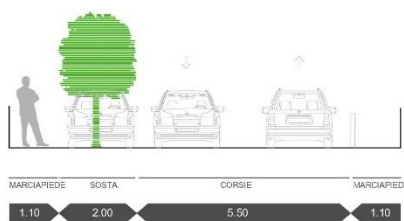
Reorganization of some road axes and redevelopment of public space

Some of the road axes that serve the village deserve a general reorganization for the purpose of ordering and making more legible the allocation of space to transit, parking, pedestrian and vehicular components.

This is the case, in the first place, of the via Volano - via Po route: on via Volano, the aim is to moderate traffic and restrict the use of parking at roadside in marked spaces, possibly improving the quality of pedestrian routes; on via Po, the main objective is to guarantee the transit of bicycles running opposite to traffic direction.



Along Via Volano, there will be three horizontal off-cuts of the carriageway, moving parking lines from one side to the other and creating three chicanes with the physical construction of flowerbeds on the side of the road to separate marked parking places.



Via Po maintains its current one-way road status, though space is made for a one-way bike trail in the opposite direction and, in the central stretch between the pharmacy and the tobacconist (between via XXV Aprile and via Lamone), there will be a single road platform raising the carriageway at the level of sidewalks.

The first part of via Valle Giralda coming from via Baiona and the stretch of via Sirotti between via Po and via Molo San Filippo can be revised to create wide sidewalks and parking lines on both sides of the roadway.

On via Molo San Filippo, it is necessary to connect the existing bike trail to the ferry terminal and to evaluate the possibility of moving off the carriageway to increase the radius of curvature with via Sirotti, to which the ferry service can be connected. These opportunities are superimposed to the need for the total redevelopment of the entire front occupied by the disused ferry dock, which represents an opportunity to enhance one of the representative nuclei of the hamlet.

Similar needs for general redevelopment are also found for the via Molo San Filippo quay between via Cottino and the shipyards and, in general, in the whole area that includes the harbour and the earth dam, with particular regard to areas used for (seasonal) parking.

Proposal to modify public transport and cruise transport routes

An issue that we also tackled as a priority concerns the routes of buses and HGVs (in particular, light and heavy commercial vehicles that supply the cruise terminal) within the hamlet, for several reasons:

- road classification: the roads on which the buses transit must technically be functionally classified at least as “interzone local roadways”, with anything that follows in terms of applicable road regulations;
- road organization: the roads on which buses and heavy vehicles transit must have adequate standards as it pertains to organization of spaces, with due attention to interference between buses and transit of other vehicles, bicycles and pedestrians;
- impact on the hamlet: transport services for cruise passengers and vehicular flows attributable to the activities of the cruise terminal create an impact in the hamlet that is negatively perceived by its inhabitants.

Although the use of the via Volano - via Po barycentric axis with respect to the hamlet leads serving the latter well, the transit of buses is not appropriate due to the rather reduced road section and the presence of marked parking places at roadside. To these difficulties on via Po are added problems related to interferences with pedestrian crossings, and, in particular, with bicycles travelling in the opposite direction of traffic.



Observing phenomena on the field and armed with all relevant road measurements of the hamlet, and to the extent that is not already done at present, the Plan proposes to forcibly divert vehicular traffic imputable to the cruise terminal (transport of people and goods) onto via Molo San Filippo, which will result in a moderate speed transit.

With regard to urban public transport, the displacement of the entrance route on via Molo San Filippo (where the buses leaving from Porto Corsini now transit) penalizes the access to stops for the northern part of the hamlet; however, if the route is extended to a ring made up of via Sirotti, via Bisca Nerino, via Guerra Teseo, via Guizzetti and again via Sirotti (see Table project in annex), the following results are obtained:

- Capitaneria di Porto is connected more directly;
- camper area, beaches and earth dam to the north are served, which can increase the attractiveness of the service in the summer;

- the most north-east portion of the hamlet is not penalized if a new stop is added in the section of via Sirotti, between via Guizzetti and via Po. Table 08 shows 250 m “buffer” reservoirs from the project stop facilities on this proposal to modify the LPT routes that almost completely cover the inhabited centre.

Although conceptually it is not advisable to change routes during the year, we believe that if the modification proposal is considered to be penalizing for accessibility to the service, the current routes for winter service can be maintained, while in summer - when interference with vehicular, cycle and pedestrian flows caused by tourist presences increases and there is a need to serve the camper area and beaches in the north - the routes can be modified, as in many tourist locations.

This measure, which can also be tested in the short term, will obviously be accompanied by widespread information and communication campaigns.

Indicators	Source
# of daily HGVs passing through Porto Corsini center	Municipality of Ravenna
% of the works foreseen by Porto Corsini Traffic Plan realized	
sqm of 30 km/h area	

2.2 Preparation of a feasibility study for an intermodal hub at the entrance of Porto Corsini - This action involves the construction of a hub outside the inhabited centre of Porto Corsini, where buses can stop while waiting to go to the cruise terminal. Buses will be able to access the cruise terminal through an entry system designed to avoid congestion in Porto Corsini. This platform would constitute an intermodal hub whose management should be carefully designed together with transport companies and cruise operators. However, it is a costly proposal both from a financial and environmental point of view, in light of the amount of soil that should be waterproofed or partially rendered permeable. Considering also the evaluation of stakeholders and the extent of the current cruise flows, we therefore determined not to proceed with the implementation of this action in the short term, postponing further verification of its feasibility at a later time, when the amount of cruise passengers increases.

Indicators	Source
# cruise passengers buses going into Porto Corsini / year	Municipality of Ravenna

STRATEGY 3 | TO IMPROVE THE ENVIRONMENTAL QUALITY OF CONNECTIONS BETWEEN THE CRUISE TERMINAL AND THE CENTRE OF RAVENNA

Description

This strategy aims at the environmental improvement of the connections between the terminal and the centre of Ravenna through both the upgrade of the vehicle fleet used for the transfer of cruise passengers on land, and the creation of new services and infrastructures to increase the share of low-emission transfers. This is a medium-long term strategy that seeks to combine synergies with other projects concerning the Ravenna area and which is part of an expansion of the tourism offer, since the strategy aims to increase the opportunities for travel and therefore also a visit to local sites.

Objectives

- To increase the low-carbon transport modes for cruise passengers
- To reduce emissions from vehicles used for transport

Actions

3.1 Limitation of circulation to polluting vehicles. A Low-Emission Zone will be established in phases in **Porto Corsini**, through the implementation of gradual actions to limit the circulation of the most polluting heavy vehicles, including buses used for the transfer of cruise passengers, which will have to comply with increasingly more stringent environmental requirements. The development of fuels from renewable and/or alternative sources will allow the introduction of vehicles with reduced, if not zero, environmental impact. With the construction of the LNG storage facility at Porto Corsini, medium-term scenarios with LNG buses can be outlined, while in the long-term, transport companies will also have to consider the opportunity to use electric vehicles. By 2020, pursuant to the provisions of the Emilia Romagna Region, which provides for the replacement of all EURO 2 buses dedicated to local public transport in Porto Corsini, cruise passengers will be transported aboard EURO 3 category vehicles, or higher. Approximately every 4 years, in line with SUMP scenarios, the minimum emission category for access to Porto Corsini will be updated in order to contribute to the reduction of polluting emissions deriving from the transfer of cruise passengers on land. In the medium and long term, it is expected that a part of the vehicle fleet of buses dedicated to cruise ship transport will be powered by LNG and/or electricity.

Year	Environmental requirements for cruise passengers coaches
2020	At least EURO 3
2024	At least EURO 5
2028	At least EURO 6

Indicators	Source
Coach fleet	Municipality of Ravenna

3.2 Connections by sea - As explained in the context analysis, the Municipality of Ravenna has set in motion the process of establishing new sea connections along the Candiano Canal. Transfers should take place on motorboats accommodating about 150 passengers to connect the coast with the city dock, where it is planned the construction of a landing place also accessible to people with reduced motor skills. Furthermore, a new connection with the railway station and the historical centre is foreseen by the extension of an already existing pedestrian underpass. Finally, the installation of a bike sharing station with 15 pedal-assisted bikes is planned. These projects are an important opportunity for cruise passengers. Although navigation is around 60 minutes, even tour operators may be interested in offering a package including a tour on the Canal. In the medium term, this action would allow a partial decrease in bus travel, which can not be totally replaced by canal connections at least in the medium term (5-6 years). The canal connection should take place using a low-environmental impact means, thus leveraging the results of the CleanPort experimentation.

Indicator	Source
% of cruise passengers using maritime connections	Port Authority

3.3 Increase bike towards Ravenna city centre

A priority action requested by stakeholders is the construction of a new cycle path between Porto Corsini and the historic centre of Ravenna. A possible trail has already been identified by FIAB and included in the SUMP in the adoption phase, as a north-south cycle route for trips home-to-school or home-to-work trips. For tourists, an alternative route has been identified since it best enhances points of naturalistic interest. The tourist itinerary, which most interests cruise passengers, is partly included in action 1.1, which provides for the creation of bike routes from the terminal to Capanno Garibaldi. With this action, we intend to include the following stretches:

- I. from Capanno Garibaldi at the entrance of the San Vitale pinewood, which should provide for the arrangement of the trail on a dirt road, the construction of a new link between Via Baiona and the left bank of the Stagghi canal and the reinforcement of the embankment itself;
- II. a part in Pineta San Vitale pinewood between the Stagghi Canal and the entrance to the wood from road SS309 Romea; in this section, works are planned, since the trails already exist;
- III. a new stretch which, after crossing road SS309, runs along Canale Magni up to Via Enrico Mattei, passing next to an already existing sports facility;
- IV. the last stretch of a mostly existing trail, from via Enrico Mattei passing through via Chiavica Romea, joins the trails of the Teodorico Park.

The entire itinerary described, including the stretches referred to in action 1.1, has been included in the Corridor of the Adriatic Cycle Route “Ciclovia Adriatica” (BI6), also in order to increase the possibility of

financing works necessary for its complete implementation. Costs are indeed high, as the new trail should include the construction of at least two new bridges.

As a measure to support the use of bicycles by cruise passengers to reach Ravenna, it would be useful to activate a bus + bike service to allow tourists to be able to return to the terminal by bus by loading their bike; this means encouraging the use of the two wheels in a “protected mode”, in which fatigue - notwithstanding assisted pedalling - or fear not reaching the terminal on time are not detrimental elements.

Indicators	Source
# of cruisers cycling to Ravenna city center	Municipality of Ravenna Port Authority

3.4 Installation of infrastructure for charging pedal-assisted bicycles at the cruise terminal

The Municipality of Ravenna is in the process of writing a memorandum of understanding for the installation of a charging station for electric vehicles. Given the LCTP objectives, it will also include the installation of a charging station for e-bicycles also to support the launch of the rental service described in action 1.3

The memorandum of understanding will also contain details concerning the data that the manager will have to provide to the Administration in order to be able to carry out a correct monitoring process. After monitoring, it will be possible to install additional charging columns

Indicators	Source
# e-bike recharge points	Municipality of Ravenna Port Authority

3.5 Improving accessibility for people with reduced mobility - In agreement with transport companies and tour operators, the Municipality of Ravenna will authorize low-impact vehicles with reduced size to access the Limited Traffic Zone (ZTL) to facilitate visits to the historical centre by people with reduced mobility. Specifically, two accesses to the ZTL will be allowed for each landing. Authorized vehicles must be specifically dedicated to people in wheelchairs or with serious walking problems. The main vehicles available today to transport companies that transfer cruise passengers can accommodate 12 guests, including 2 on wheelchairs and are just over 4 m long. These vehicles are powered by diesel and belong to the EURO 6B category, which is currently one of the most stringent in terms of polluting emissions. In the long term, a provision was made to deliver transfer services by electric vehicles. Vehicles can make a stop in front of the Alighieri Theatre, on via Angelo Mariani, in the historic centre of Ravenna. Once cruise passengers have gotten off, the vehicle must stop in the Piazzale Giustiniano parking lot, which will soon be acquired by the Municipality of Ravenna and where 2 stalls will be reserved for the vehicles described above.



Indicators	Source
# of buses for people with reduced mobility	Municipality of Ravenna
# of cruise passengers using of buses for people with reduced mobility	Port Authority

3.6 Works in the historic centre for the regulation of **bus transit** - the Municipality of Ravenna is defining the regulation for the establishment of a limited traffic area for buses. The ZTL BUS is an area to which tourist buses can access after payment of a ticket. Buses that transport cruise passengers, given the particularity of the target, will be exempt from the payment of the fare.

4 Future scenarios

Given that the LCTP is a first implementation of the actions of the SUMP, the same future scenarios have also been adopted here, which are summarized below:

- **“Business as usual” scenario** describes developments that do not depend on the Plan and, therefore, only envisage trends that result from other forecasts and plans. To each time context, given that the hope is to increase the number of cruise passengers, corresponds a trend scenario that takes into consideration the number of cruise passengers estimated for the time references described below;
- **The short-term scenario** includes the most immediate actions that can be **initiated** within 2/3 years of LCTP approval
- **The medium-term scenario** includes more complex actions that require more detailed planning than short-term actions do, and, generally, are more onerous in financial terms; actions included in this scenario are expected to start within 5/6 years from the entry into force of the Plan
- **The long-term scenario** includes actions that complement the overall vision of the Plan. These are the most complex actions and involve greater economic and planning commitment than the actions envisaged in the short and medium term.

Each action has been related to one or more scenario identified within the SUMP

ACTIONS	SCENARIO			
	BAU	SHORT TERM	MEDIUM TERM	LONG TERM
Improvement of accessibility to points of interest near the cruise terminal		X	X	X
Cycle and pedestrian wayfinding system		X		
Activation of a new service of e-bike rent (MOSES project)	X			
Implementation of interventions foreseen by Detailed Urban Traffic Plan		X	X	
Preparation of a feasibility study for an intermodal platform				X
Limitation of circulation to polluting vehicles		X	X	X
Connections by sea	X			
Increase bike trips towards the center of Ravenna				X
Installation of infrastructure for charging e-bike bicycles at the cruise terminal		X		
Improving accessibility for people with reduced mobility		X	X	
Regulation of bus transit in the city center	X			

2.4 Step 4: Monitoring and funding

2.4.1 Monitoring LCTP implementation

The selected indicators are strongly related with those ones included in the SUMP. For obvious reasons, some new indicators have been introduced, but the reference scenarios are still the same of those pinpointed in the SUMP.

In general, for each indicator, we identified a target to be achieved in reference to each scenario. We highlight the presence of a context indicator that does not depend on the implementation of the LCTP. The number of cruise passengers as explained in the previous paragraphs depends on many factors, which, in turn, are largely not dependent on public bodies, but on the performance of the international market and geopolitical balances that cannot be predicted. The targets of the Plan indicators necessarily depend on reaching the number of cruise passengers in each scenario.

INDICATOR	CURRENT	BAU	SHORT TERM	MEDIUM TERM	LONG TERM
Cruise passengers - <i>context indicator</i>	50.000		50.000	150.000	200.000
km of bike paths from cruise terminal	0.3	0.3	5	15	33
# points of interests 5 km far from cruise terminal accessible for cyclists and pedestrians	0	0	2	6	9
# of cruise passengers visiting points of interest near cruise terminal	N.A.	0%	2%	4%	8%
# of signals installed	0	0			
% of cruise passengers using maritime connections	0	0	1%	2%	5%
# of daily HGVs passing through Porto Corsini center	200	200	10	10	10
# cruise passengers buses going into Porto Corsini / year	~300	~300	~300	~600	<i>To be evaluated with feasibility study</i>
Coach fleet			<i>According to strategy 3</i>		
# bikes available for cruise passengers	20	20	20	30	30
# e-bikes available for cruise passengers	0	20	20	30	30
Average bike rent rate	N.A.	30%	50%	50%	50%

# of cruise passengers using bikes	0%	0%	1%	2%	5%
# of cruisers cycling to Ravenna city center	0%	0%	0%	0%	1%
# e-bike recharge points	0	0	2	2	5
# of buses for people with reduced mobility	0	0	2	2	2
# of cruise passengers using of buses for people with reduced mobility	0	0	200	400	600
area of 30 km/h (sqm) (% of total Porto Corsini area)	0	0	~35.000 (10%)	~215.000 (70%)	~310.000 (100%)

Moreover, in the tables below we identified a responsible person and one or more milestones for each action.

STRATEGY 1– IMPROVING TOURIST ACCESSIBILITY TO POINTS OF INTEREST IN THE PROXIMITY OF THE TERMINAL						
Actions	Results	Indicators	Source	Monitoring responsible	Milestones	Description and methodology
1.1 Improvement of accessibility to points of interest near the cruise terminal	Cruise passengers visit points of interest near the terminal	km of bike paths from cruise terminal # points of interests 5 km far from cruise terminal accessible for cyclists and pedestrians # of cruise passengers visiting points of interest near cruise terminal Average bike rent rate	Mobility Planning Department – Municipality of Ravenna Port Authority	Municipality of Ravenna	M1.1.1 one of the point of interest identified by stakeholders is easily accessible by pedestrian and bicycles	Bike and pedestrian paths' construction will be monitored considering the certification of proper execution issued by construction company, according to Italian legislation. Collection of data of possible future shore excursions to points of interests near cruise terminal Collection of data about number of bikes used by cruise passengers Questionnaires
1.2 Cycle and pedestrian wayfinding system	Cruise passengers can explore areas near the terminal safely and easily	# of signals installed	Mobility Planning Department –	Municipality of Ravenna	M1.2.1 The wayfinding plan is approved	Number of signage points will be included in the wayfinding plan

			Municipality of Ravenna		M1.2.2 the first signage point is installed M1.2.3 the first totem is installed	The number of signals installed will be monitored considering the certification of proper execution issued by installation company, according to Italian legislation. .
1.3 Activation of a new service of e-bike rent (MOSES project)	Cruise passengers can rent e-bike directly at the terminal	# e-bikes available for cruise passengers Average bike rent rate	Mobility Planning Department – Municipality of Ravenna Port Authority	Municipality of Ravenna	M1.3.1 Launch of the e-bike rent service M1.3.2 The rent service continues beyond MOSES project.	Data will be collected in collaboration with Port Authority

STRATEGY 2 – IMPROVING URBAN QUALITY IN PORTO CORSINI						
Actions	Results	Indicators	Source	Monitoring responsible	Milestones	Description and methodology
2.1 Execution of works foreseen by Detailed Urban Traffic Plan	reduction of the adverse effects caused by the transit of buses in the town of Porto Corsini, improvement of safety conditions, especially for users with challenges, and the urban quality of the Via Po axis	# of daily HGVs passing through Porto Corsini center % of works realized	Mobility Planning Department – Municipality of Ravenna	Municipality of Ravenna	M2.1.1 Detailed design approved for the first part of works M2.1.2 Execution of the first part of works	Traffic flows indicators will be collected with mobile instruments owned by the municipality The % of works realized will be monitored considering the certification of proper execution issued by construction company, according to Italian legislation.
2.2 Preparation of a feasibility study for an intermodal platform at the entrance of Porto Corsini	The City Council will be able to evaluate impact, costs and benefits of an intermodal parking outside the residential area of Porto Corsini	# cruise passengers buses going into Porto Corsini / year	Mobility Planning Department – Municipality of Ravenna Port Authority	Municipality of Ravenna	M3.4.1 Identification of an external experts able to elaborate the feasibility study	Data about cruise passengers' coaches will be collected in cooperation with Port Authority

STRATEGY 3 - IMPROVING THE ENVIRONMENTAL QUALITY OF CONNECTIONS BETWEEN THE CRUISE TERMINAL AND THE CITY						
Actions	Results	Indicators	Source	Monitoring responsible	Milestones	Description and methodology
3.1 Limitation of circulation to polluting vehicles	Pollutant emissions produced by cruisers' coaches are reduced.	Coach fleet	Transport operators Mobility Planning Department – Municipality of Ravenna	Municipality of Ravenna	M3.1.1 50% of coaches for cruise passengers will be EURO 4 category vehicles, or higher M3.1.2 a GNL bus service is active for cruise passengers M3.1.2 an electric bus service for cruise passengers is active	Data will be collected in cooperation with bus operators.
3.2 Connections by sea	Part of cruise passengers can reach Ravenna city center by sea through the canal	% of cruise passengers using maritime connections	Transport operator	Municipality of Ravenna	M3.2.1 a maritime connection between the cruise terminal and city centre is active	Data will be collected in cooperation with bus operators.
3.3 Increasing bike trips towards Ravenna city center	Cruise passengers can cycle to Ravenna city center	Average bike rent rate	Mobility Planning Department – Municipality of Ravenna	Municipality of Ravenna	M3.3.1 The detailed design of the bike path is ready	Bike paths' construction will be monitored considering the certification of

		# e-bikes available for cruise passengers # e-bikes rented for cruise passengers # of cruise passengers using bikes km of bike paths from cruise terminal # of cruisers cycling to Ravenna city center	Port Authority		M3.3.2 A construction company has been identified M3.3.1 a bus+bike service for cruise passengers is active	proper execution issued by construction company, according to Italian legislation. GPS system will provide information about destinations of users Questionnaire
3.4 Installation of infrastructure for charging e-bike bicycles at the cruise terminal	A bike recharge point is available for cruise passengers	# e-bike recharge points	Private operator	Municipality of Ravenna	M3.4.1 the memorandum of understanding is signed M3.4.2 The first recharge point is installed	Data will be collected according to the procedure defined in the memorandum of understanding
3.5 Improving accessibility for	Cruise passengers with reduced mobility can easily	# of buses for people with reduced mobility	Transport operators	Municipality of Ravenna	M1.3.1 creation of parking spots reserved	Data will be collected in

people with reduced mobility	access the historic center.	# of cruise passengers using of buses for people with reduced mobility	Mobility Planning Department – Municipality of Ravenna		to minibus for people with reduced mobility M1.3.2 transfer service for people with reduced mobility is active	cooperation with bus operators.
3.6 Regulation of bus transit in the city center						

► POLLUTING EMISSIONS

Based on the scenarios identified above, since each one assumes a different number of cruise passengers as a context indicator, for each time frame, we identified and compared a “Plan scenario” and a “trend scenario”. For example, for the medium-term scenario, pollutant emissions have been calculated on the basis of a flow of 150,000 cruise passengers, considering the actions envisaged by the LCTP for the Plan scenario and only the actions envisaged by the BAU scenario for the trend scenario.

To determine the baseline of pollutant emissions, we estimated an indicator that evaluates the lengths travelled by bus per cruise passenger per year, a value that has been calculated based on the data of shore excursions made in 2017. We combined this indicator with the composition of the fleet of vehicles used to transport cruise passengers and with emission factors referring to the 3 main pollutants (CO₂, NO_x and PM₁₀).

For the estimation of emission factors, the methodology used refers to the database of average emission factors for road transport in Italy, provided by the Italian Institute for Environmental Protection and Research (ISPRA). The ISPRA methodology developed and applied to the estimation of atmospheric pollutant emissions is based on the 2016 EMEP/EEA Air Pollutant Emission Inventory Guidebook and is consistent with the 2006 IPCC Guidelines for greenhouse gases. ISPRA used COPERT 4 software, vers. 11.4, whose development is coordinated by the European Environment Agency, as part of the activities of the European Topic Centre for Air Pollution and Climate Change Mitigation (ETC/ACM). The estimates were processed by ISPRA on the basis of the national input data regarding fleet and circulation of vehicles (number in the fleet, average mileage and average consumption, speed per vehicle category with reference to urban, extra-urban and motorway driving cycles, and other specific national parameters). Emission factors are available:

- both with respect to kilometres travelled and consumption,
- with reference to details of technologies and aggregation by sector and fuel,
- processed both on a total level and separately for the urban, extra-urban and motorway areas.

For the case of Ravenna, given the different types of contexts travelled by buses to reach the destinations of cruise excursions, we decided to consider polluting factors relating to tourist buses of less than 18 tonnes processed at a total level, without distinction of urban, suburban (extra-urban) and motorway contexts.

With reference to the evaluation of the expected results of the Plan, for each strategy, we considered as the effects of relevant actions either the decrease of routes travelled by bus or the improvement of vehicle fleets for cruise passengers, or the percentage reduction of polluting emissions.

The reduction of the Km/passenger/year indicator was calculated differently, as described below, according to the action being assessed. The improvement of the vehicle fleet took into account restrictions to access to Porto Corsini described in action 3.1, assuming that the share of buses belonging to the emission categories that will not be allowed access to the site will be equally distributed among other admitted categories. If it was not possible to arrive at emission factors due to the implementation of an action, we evaluated, where possible, a percentage reduction compared to an emission category taken as reference on the basis of scientific articles specifically mentioned.

Emissions have therefore been calculated with factors calculated above by applying the number of cruise passengers referred to the considered scenario.

STRATEGY 1

The expected result of the actions aimed at improving accessibility of the points of interest near the terminal was assessed taking into account cruise days, available bicycles, estimate of distances travelled by each user and rental rate. Based on these factors, we could estimate km/passenger per year rate not travelled by bus, thanks to the implementation of the actions included in the strategy.

STRATEGY 2

The improvement of the environmental and urban quality in Porto Corsini implies numerous effects, in addition to those related to the reduction of emissions: greater safety, better quality of public space, decrease in accidents, support for the shift towards more sustainable modes of travel. Furthermore, the change of the public and private collective transport line on via Molo San Filippo involves the elimination of the canyon effect on via Volano and via Po and a greater factor in the dispersion of pollutants. However, it should be emphasized that via Molo San Filippo overlooks the Candiano Canal, which is affected by intense traffic of commercial ships, which constitute a significant polluting source, about which, however, the Plan cannot act.

The reduction in emissions due to this strategy can be traced back to a general decrease in speed at Porto Corsini. Although there are no studies related to buses, there are several studies demonstrating the correlation between pollutants and speed. An article published by Imperial College of London (Williams D & North R, 2013, "An evaluation of the estimated impacts on vehicle emissions of a 20 mph speed restriction in central London") shows the following table:

Vehicle type	Drive cycle Speed Limit (km/h)	NOx (g/km)	PM10 (g/km)	CO2 (g/km)
Petrol 1.4l -2.0l, EURO IV	30	0.0726	0.00218	271.95
Petrol 1.4l -2.0l, EURO IV	50	0.0673	0.00237	266.35
Impact of 30 km/h drive cycle		+7.9%	-8.3%	+2.1%
Diesel 1.4l -2.0l, EURO IV	30	0.7437	0.01758	201.58
Diesel 1.4l -2.0l, EURO IV	50	0.8104	0.01917	203.48
Impact of 30 km/h drive cycle		-8.2%	-8.3%	-0.9%

Although the table refers to a car powered by diesel technology, like most of tourist buses, it can be assumed that the effective speed reduction at Porto Corsini involves a real reduction of pollutants which, however, cannot be quantified given the absence of known scientific studies concerning buses

STRATEGY 3

The effects of the actions included in the last strategy have been estimated in different ways.

The share of buses whose access to the site will not be allowed has been distributed equally among other permitted categories; the effect of the use of buses powered by LNG has been estimated by referring to the

Consultation Document for a National LNG Strategy (MiSE 2015) which assumes the following reductions due to the replacement of an 8% EURO IV vehicles with LNG-powered vehicles.

Fleet composition (only diesel)		Fleet composition (with LNG vehicles)	
EURO IV	25.9%	EURO IV	17.9%
EURO V	32.3%	EURO V	32.3%
EURO VI	41.8%	EURO VI	41.8%
LNG	0%	LNG	8.0%

	Current Fleet (only diesel)	New Fleet (with LNG vehicles)	Reduction
CO ₂ (t)	1561	1500	-3.9%
NO _x (kg)	5289	4900	-7.2%
PM (kg)	120	88	-26.1%

An additional Dutch study¹ relating to heavy vehicles powered by LNG shows an 80% reduction of NO_x and 20 to 25% of CO₂ compared to EURO VI vehicles. For precautionary purposes, the reductions reported in the MiSE document were considered, since they are lower than those of the Dutch study.

For the activation of new sea connections to integrate existing land connections, we could not quantify pollutant reductions in relation to the displacement of a share of cruise passengers with an LNG vessel. In fact, to date, there is not enough data to evaluate the emissions of small boats powered by LNG. However, it is assumed that this action does not lead to any increase in emissions.

Regarding actions related to cycling to Ravenna and the installation of electric columns for the recharging of bicycles, the effects in terms of emissions have been evaluated considering landing days, available bicycles, kilometres travelled and vehicle rental rates, assuming that the combination of the two actions leads to a synergy able to increase the number of cruise passengers willing to reach Ravenna by bicycle. Based on these factors, we could estimate km/passenger per year rate not travelled by bus, thanks to the implementation of the two actions.

Finally, we assumed that the two actions relating to people with reduced mobility and to bus ZTL limitations do not involve any variation in terms of emissions.

¹Dutch Study

	CURRENT SCENARIO	SHORT TERM		MEDIUM TERM		LONG TERM	
		BAU	LCTP SCENARIO	BAU	LCTP SCENARIO	BAU	LCTP SCENARIO
CRUISE PASSENGERS	50.000	50.000	50.000	150.000	150.000	200.000	200.000
CALLS	48						
DISEMBARKATION DAYS	43	43	43	129	129	172	172
KM SAVED/CRUISE PASSENGER/YEAR	0	0,01032	0,0172	0,00258	0,1075	0,00258	0,1763
KM TRAVELLED BY VEHICLES/CRUISE PASSENGER/YEAR	0,96	0,95	0,94	0,96	0,85	0,96	0,79

	CURRENT SCENARIO	SHORT TERM			MEDIUM TERM			LONG TERM		
		BAU	LCTP SCENARIO	REDUCTION	BAU	LCTP SCENARIO	REDUCTION	BAU	LCTP SCENARIO	REDUCTION
Cruise passengers	50.000	50.000			150.000			200.000		
CO ₂ [t]	31,000	30,65	30,64	-	30,5	28,16	-8%	123,03	96,79	-21%
PM10 [kg]	5,61	11,09	8,57	-22%	10,01	4,5	-55%	20,18	4,39	-78%
NOx [kg]	227	448	362	-19%	444	127	-71%	895	35	-96%

2.4.2 Funding

The total budget of the Plan is about 6.800.000 euro. The table below specifies costs for each strategy.

STRATEGY	COSTS
IMPROVING TOURIST ACCESSIBILITY OF INTEREST IN THE PROXIMITY OF THE TERMINAL	2.850.000 €
IMPROVING URBAN QUALITY IN PORTO CORSINI	1.310.000 €
IMPROVING THE ENVIRONMENTAL QUALITY OF CONNECTIONS BETWEEN THE CRUISE TERMINAL AND THE CITY	2.662.000 €

A more detailed cost analysis is reported in the next table, where possible sources of funding have been pinpointed

ACTIONS	DESCRIPTION	COSTS	POSSIBLE SOURCES OF FUNDING
1.1 Improvement of accessibility to points of interest near the cruise terminal	Completion of bike paths connecting cruise terminal to city center	2.750.000 €	National or regional resources European funds
	Path connecting cruise terminal to beach resorts	50.000 €	Port Authority
1.2 Cycle and pedestrian wayfinding system	Installation of wayfinding system	10.000 €	Regional funds
1.3 Activation of a new service of e-bike rent	Installation of a bike rent service in a mobile depot	40.000 €	Already funded by Interreg and private resources
TOTAL STRATEGY 1			2.850.000 €

ACTIONS	DESCRIPTION	COSTS	POSSIBLE SOURCE OF FUNDING
2.1 Implementation of works foreseen by Detailed Urban Traffic Plan	Realization of works foreseen by Detailed Urban Traffic Plan	1.300.000 €	National, regional or municipal resources European funds
2.2 Preparation of a feasibility study for an intermodal platform		10.000 €	Municipal resources
TOTAL STRATEGY 2			1.310.000 €

ACTIONS	DESCRIPTION	COSTS	POSSIBLE SOURCES OF FUNDING
3.1 Connections by sea	Floating accessible dock	800.000 €	Already funded by the State requalification outskirts' program
	Activation of a new maritime connection through Candiano Canal	350.000 €	Already funded by national requalification outskirts' program
3.2 Increase bike trips toward city center	Completion of bike network	1.500.000 €	National funds related to national bike paths Private funds
3.3 Installation of infrastructure for charging e-bike bicycles at the cruise terminal	Installation of a recharge point for e-bike	10.000 €	Already funded by private operator
3.4 Improving accessibility for people with reduced mobility	Installation of special signage system to reserve a parking space for minibuses providing this service	1.000 €	Municipal funds
3.5 Regulation of bus transit in the city center	Implementation of the new regulation for bus transit in the city center	/	/
TOTAL STRATEGY 3			2.662.000 €