

# ACTION PLAN

for implementing sustainable measures for achieving  
resilient transportation in

# Metropolitan city of Capital Rome

between April 2019 and March 2021



## INTRODUCTION

Transportation in urban areas, particularly metropolitan regions, generates congestion and vast greenhouse gas emissions and thus imposes enormous challenges upon authorities in providing healthy living conditions for inhabitants and a supportive environment for businesses. Thus, the overall objective of the SMART-MR (Sustainable Measures for Achieving Resilient Transportation in Metropolitan Regions; Interreg Europe Programme) is to support local and regional authorities in improving transport policies and providing sustainable measures for achieving resilient low-carbon transportation and mobility in metropolitan regions. To tackle this issue, 10 project partners from 8 metropolitan regions (Oslo, Gothenburg, Helsinki, Budapest, Ljubljana, Rome, Porto and Barcelona) have shared their experience in transport and mobility planning by organizing 7 topically interrelated workshops. For each workshop the partners have issued an in-depth analysis, describe good practices and organize a study visit. Practical experiences have been presented and discussed, and policy recommendations developed. Through the project outputs, such as the guide Transforming European Metropolitan Regions: Smart Mobility for Better Liveability, selected good practice descriptions, and policy recommendations, and through dissemination events, such as political meetings, the final conference, and regional stakeholder meetings, SMART-MR contributes to Europe 2020 goals, Cohesion Policy, and the Interreg Europe Program by aiding managing authorities and regional and local authorities in setting new transport and mobility policies.

At the level of individual metropolitan region, the partners have used experiences, gained in the SMART-MR, to fine-tune own set of activities and goals, that are fully presented in this action plan.

## ACTION PLAN

### Part I – General information

**Project:** SMART\_MR - Electronic Ticketing Systems software evolution. Installation of new on-board, storage and territory systems in the metropolitan area of Rome  
(Evoluzione software SBE. Installazione nuovi sistemi di bordo, di deposito e di territorio nell'area metropolitana di Roma)

Partner organization: Metropolitan City of Capital Rome \_\_\_\_\_

Other partner organizations involved (if relevant):\_Lazio Region \_\_\_\_\_

Country: Italy \_\_\_\_\_

NUTS2 region:\_2 Lazio Region \_\_\_\_\_

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### Part II – Policy context

#### The Action Plan aims to impact:

- Investment for Growth and Jobs programme
- European Territorial Cooperation programme
- Other regional development policy instrument

**Name of the policy instrument addressed:** ERDF ROP Lazio, Axis 4 "Sustainable energy and mobility" Action 4.6.3 'Intelligent Transport Systems'

### Part III – Details of the actions envisaged

#### **ACTION: Evolution software SBE**

##### **1. The background** *(please describe the lessons learnt from the project that constitute the basis for the development of the present Action Plan)*

Mobility is one of the main problems for metropolitan areas throughout Europe. Atmospheric pollution from exhaust gas, traffic congestion, noise but also road accidents, mainly affect citizens living in urban areas but also commuters who travel to cities every day for study, work or other reasons. On the other hand, sparsely populated areas and urban suburbs suffer from poor accessibility and limited services, especially in terms of public transport.

The transport sector provides the highest contribution to NO<sub>x</sub> emissions (Nitrogen Oxides). As reported in the EEA report "Air Quality in Europe 2016" it represents 46% of the total EU emissions to 28 countries (it was 47% in 2014). What emerges is that unfortunately NO<sub>x</sub> emissions from road transport have not been reduced as it was foreseen with the introduction of vehicle emission standards (eg Euro 6, etc.).

This is probably also due to the fact that emissions, in real driving conditions, are higher than those indicated by car manufacturers (It is well known the recent scandal that has shown how diesel cars emit up to 6 times more NO<sub>x</sub> compared to the values registered in the tests performed in the laboratory).

Furthermore talking about PM, which cause serious damages to health, especially to children, some European studies indicate that emissions of traffic exhaust gases are equal to about 50% of primary PM<sub>10</sub> exhaust emissions and about 22% of exhaust emissions of primary PM<sub>2.5</sub> (ETC / ACC, 2010a).

It has been shown that, even with zero emissions from vehicle exhaust pipes, traffic will continue to contribute significantly to PM emissions through non-exhaust emissions (Dahl et al., 2006; Kumar et al., 2013). It has been estimated that in the next few years, almost 90% of the total PM emissions of road traffic will not be produced from exhaust gas but from the consumption of brakes, tires, asphalt etc. (Rexeis and Hausberger, 2009).

It can be said that the problems related to citizens and goods mobility are now widely perceived as one of the most urgent problems to be faced in large urban areas and this represents one of the challenges that the overall governance of metropolitan areas, and public authorities to all levels, must face. There is also a growing sense of urgency, about the necessity for interventions that addresses the problems of metropolitan mobility towards its greater sustainability and resilience, with short, medium and long-term actions.

The European Commission, aware of the gravity of these problems, especially in metropolitan regions, has long been developing various tools for mobility issues in the last decade, numerous studies, such as the Action Plan on Urban Mobility (2009), the Transport White Paper (Roadmap ... 2011), the Eltis guideline for sustainable urban mobility plans (SUMP; Eltis 2014), and the EU initiative CIVITAS (2019), directed to address transport-related challenges in Europe in a more sustainable way.

Also at national and local level, with different competences, the problem of sustainable and resilient mobility has been tackled and an important part of the Eu funds allocated through the national and regional ERDF Operational Plan has been dedicated to interventions on this topic.

In particular, the Interreg Europe program has been closely linked to the local Eu funds through identifying for each partner an Action Plan, a local project linked to a policy instrument identified in the local plans of the structural funds, that have been carried out and monitored by referring to the experiences, exchanges of good practices, implemented through the Interreg projects.

The SMART-MR project faced up these problems, analysing some of the most important aspects of mobility, felt as a complex system of the movement of citizens and goods, and it mainly concerns transport but also the organization of urban space and the social and economic development of the territory.

During the seven workshops, intense exchanges of information and experiences made it possible to compare the results obtained in each cities involved in the project with different approaches and methods, in order to gather a good number of best practices.

## **Lesson learn from the international workshop and the exchange of experiences of the project**

The interregional exchange of experiences has followed the steps (workshops), presented in the introduction, where we discussed the seven thematically interrelated topics. The main conclusions of the interregional learning process, that took place within the SMART-MR project are presented below:

### **I. Participatory transport planning**

The exchange of experiences in the field participatory transport planning had two main aims – I) to define participatory methodology for the project and II) to elaborate on partners' experiences in order to guide and implement successful participatory planning process at regional level. The main lessons learnt were linked to specifics of the participatory planning at the regional level and to experiences with larger and sometimes unpopular investment projects. Activities at the local level are more concrete and easier to understand, whereas the complexity of tasks rises with the territorial level. This also affects the participation and engagement of the public. At the local level, initiatives often come from residents because they clearly understand the needs of the community and respond appropriately. At the regional, national, and international levels, the issues become more complex and abstract, and they can only be managed by politicians and professionals (i.e., planners and experts), whereas the residents are mostly represented by NGOs or representatives of the civil sector. At the regional stakeholder meetings, we have noticed larger interest of institutional stakeholders whereas we approached the citizens by using e-tools.

### **II. Regional mobility planning**

The lessons learnt already in the first topic (e.g. specificities of the regional level) proved relevant also for the regional mobility planning, where we compared the experiences on preparing mobility plans at the regional level. To ensure integral and sustainable development of metropolitan regions, a shared vision is crucial. The central issue to be addressed while formulating a shared vision is “what kind of city do we want to live in?” and it should be created by involving all interested parties. A common strategic vision provides a description of the quality of living in a metropolitan region and serves as a guide for developing general spatial planning measures in which mobility and transport are crucial, today and in the future.

Sharing a common vision on mobility between stakeholders and the general public is an essential step in mobility planning. It should contribute to balanced and sustainable development of the environmental, economic, and social components of the territory and thus to a higher quality of life. It is also important to balance the level of the vision (and ambition) in a plan with the level of realism, consisting of what can actually be implemented during the timeframe of the plan.

This process needs to take into account the existing multimodal transport system, its conditions, and performance. It should also take into consideration land-use planning and factors that may affect the future of the area and the future performance of the transport system, including the availability of financial resources. Multiple scenarios should be developed, indicating possible alternatives. Each alternative scenario is compared to the reference scenario, including the interventions currently being implemented and to be implemented within the given timeframe.

In a long-term perspective, the objective of the mobility plan is to provide a safer and more efficient mobility system. It also ensures an environmentally, economically, and socially more sustainable system of mobility, especially when the actions contributing to the aforementioned objective are identified during the creation of the plan together with institutions, stakeholders, and the general public. The mandatory monitoring of the plan involves measurement of the indicators linked to each individual action every two years.

The actions to be applied concern:

– Integration between the various transport systems (redistribution of the transport network in favour of public transport, pedestrians, and cyclists, strengthening interchange nodes);

- Improvement of public transport provision (lanes reserved for public transport, increase of accessibility to public transport for passengers with reduced mobility, and use of information communication technologies (ICT) to improve public transport management);
- Development of pedestrian and bicycle mobility (creation of cycling routes and services for cyclists);
- Introduction of shared mobility systems (shared mobility equipment at train or underground stations, transit and parking facilities for shared mobility, and promotion of shared mobility in public bodies and companies);
- Use of low-pollution vehicles (installation of electric charging stations, and replacement of vehicles for passenger and freight transport with electric vehicles);
- Rethinking urban logistics (changing the collection and distribution of goods in urban areas in order to reduce traffic and pollution, and redistributing the road capacity for improved flows of goods vehicles);
- Dissemination of the culture of safe mobility (improving the most dangerous road network, creating stops and protected sidewalks for pedestrians, and protected bicycle lanes).

On general, we underlined the use of the Avoid-Shift-Improve approach, which is used to address increased transport demand in a more sustainable way (GIZ-SUTP 2012):

- “Avoid” refers to the need to improve the transport system’s efficiency, reducing the need to travel and the length of the journey through integrated land-use planning and transport demand management.
- “Shift” instruments attempt to improve the efficiency of the journey through a modal shift from the most energy-consuming (i.e., cars) to more environmentally friendly urban transport modes:
  1. Non-motorized transport such as walking and cycling: these are the most environmentally friendly option;
  2. Public transport such as buses, trains, and so on; although public transport generates emissions, lower specific energy consumption per km and higher occupancy levels mean that the associated CO2 emissions per passenger/km are lower when compared to cars.
- The “Improve” component focuses on vehicle and fuel efficiency as well as on improving transport infrastructure; it seeks to improve the energy efficiency of transport modes and vehicle technology. Furthermore, the potential of alternative sustainable energy use is encouraged.

### **III. Low-carbon logistics**

The long-term actions and impacts of low-carbon logistics planning mainly focus on the reduction of transport externalities and vehicle movements, as well as improved acceptance and understanding of commercial activities in metropolitan regions. Thus, low-carbon logistics planning must become part of transport planning, which so far has not been particularly common.

First, long-term reduction in carbon emissions and improvement of air quality can be achieved from reduced vehicle movements. Therefore, to reduce freight traffic in metropolitan regions the total demand for freight transport must decrease or deliveries must become more efficient. Efficiency can be achieved through implementing solutions that increase load factors; for example, consolidation. Additional emission reductions can be expected from the transition to cleaner fuels and the introduction of eco-friendly vehicles for deliveries.

The second long-term benefit of low-carbon logistics planning is improved acceptance and understanding of these activities among all stakeholder groups. Increasing this acceptance might result in opportunities for shared infrastructure because stakeholders then become aware of the needs of the business sector. Another benefit is more effective and consensus-based stakeholder collaboration, which in the end provides a valuable framework for decision-making and policy implementation. Whereas the municipality traditionally focuses on social and environmental issues, businesses emphasize efficiency, accessibility. Authorities also have the opportunity to guide industry by changing their own delivery and procurement practices, either by having deliveries performed by one single operator or by imposing requirements of zero-emission vehicles on operators delivering their goods. Improved knowledge of the private-sector needs helps improve the quality of public planning, and the best solution is based on the compromise achieved when the municipality knows the needs of businesses and the general public.

Finally, metropolitan regions are facing rapid changes in the transport sector due to digital and technological developments. With these changes in mind, long-term logistics planning and efficient public-private collaboration will improve the commercial potential of sustainable distribution solutions and provide more efficient management of freight traffic in metropolitan regions, which in turn will help reduce emissions.

**IV. Development of and around transport nodes & V. Low-carbon urban areas**

Transit corridors, especially rail-based corridors, are vital for urban development. Station areas are recognized as a development priority in terms of mobility, urban development, and climate targets. They are the starting points for transforming the urban environment from low-carbon station areas to low-carbon metropolitan regions. Station areas or public transport hubs are the key focus for transit-oriented development (TOD). The TOD main drivers are reduction of car use and reducing congestion and pollution by avoiding urban sprawl. At the same time, TOD aims to increase regional accessibility by acquiring well-connected and affordable land for development in transport corridors.

TOD integrates transport and land-use planning, but at the same time it is a narrow concept that focuses on transport and how to make transit as effective as possible. It is defined as an area that has a compact and dense design with both housing and services within walking distance of public transport and with regional connectivity. Thus, TOD economizes mobility by decreasing the need for travel and by making possible efficient provision of public transport. In addition to TOD, there is a need for a broader perspective for community and low-carbon development, both in densifying the existing urban area and in creating new station areas.

The new development concept creates the need to redefine TOD. Supported by the study “Sustainable Density in Station Communities” (Nordström, Swartz and Ståhle 2017), recommended density for exploitation used by UN Habitat (2015) is added.

The aim of the sustainable densification and compact areas is both to increase the population within the given space and also to maintain a well-defined division of land use that ensures that a high-quality and accessible urban area with an optimal land-use mix is obtained (Figures 1 and 2).

Figure 1: Example of efficient distribution of land use (Nordström, Swartz and Ståhle 2017).

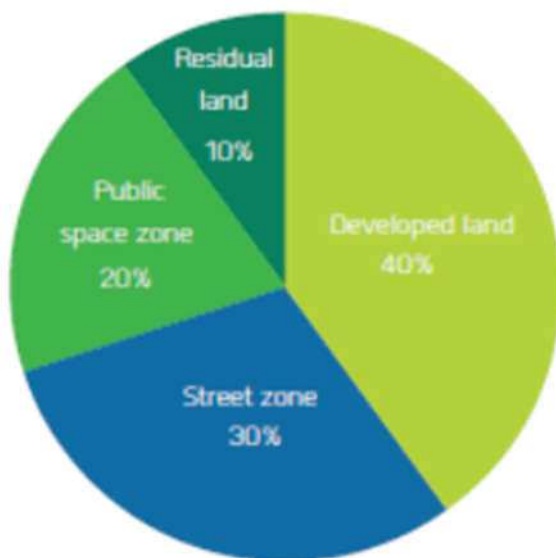
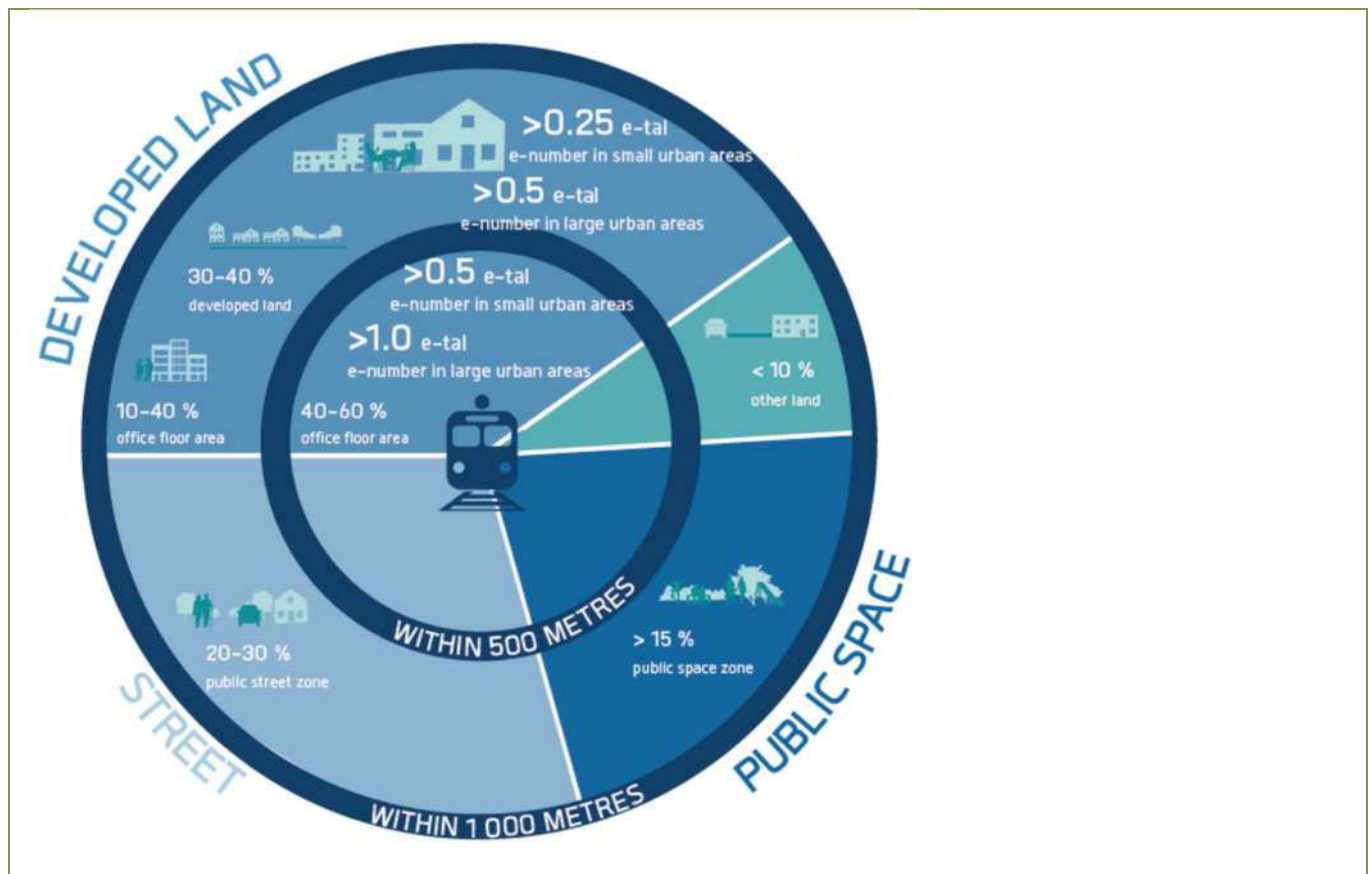


Figure 2: Land-use recommendations (Nordström, Swartz, and Ståhle 2017).



Thus the SMART-MR project developed a new methodology named Liveability-Oriented Area Development (LOAD).

LOAD is proposed to use what is commonly considered a sustainable development perspective, combining the three dimensions: economic, environmental, and social development.

LOAD is defined by an area developed with dense housing, mixed use, and liveability targets that create attractiveness.

LOAD uses a methodology that is based on UN Habitat's guidelines.

LOAD recommends considering these guidelines as an inspirational tool for development and using the set principles outlined as goals.

LOAD proposes a flexible attitude for how to reach these goals at the local level, adapting recommendations to unique circumstances but with the overall goals in mind.

The LOAD concept, from the perspective of efficient land use and the land-use mix in station areas, is recommended to be applied both for pre-existing station areas when complementing urban structures and for new station areas when planning land use. According to LOAD with a low-carbon development aspect, the building stock in station areas should consist of energy-efficient multifunctional buildings with businesses integrated with housing. Housing should also be mixed; that is, station areas should provide different types of housing supply for people's different needs. It is also important to increase affordable housing near stations. Increasing the amount of housing stock and residents improves the ability of services to enter the region and increase their profitability. All this requires close joint planning of land use, housing, and mobility.

At the workshop on low-carbon station areas additional concept for low-carbon station areas has been developed for assisting planners to meet climate targets. The concept will help cities develop low-carbon areas both in existing urban structure as well as in planning new station areas. In the concept, there are four perspectives on low-carbon station areas – land use, housing and living, mobility, and businesses and services –



and there are four cross-cutting themes: climate change mitigation, resilience, a circular economy, and social sustainability and health. In addition, technology integration and leadership are recognized as essential parts of transformation. Nearly seventy different criteria will help planners and city developers transform low-carbon areas step by step (Figures 3 and 4).

Figure 3: The low-carbon district toolkit for station areas includes planning criteria in four themes and four crosscutting perspectives.

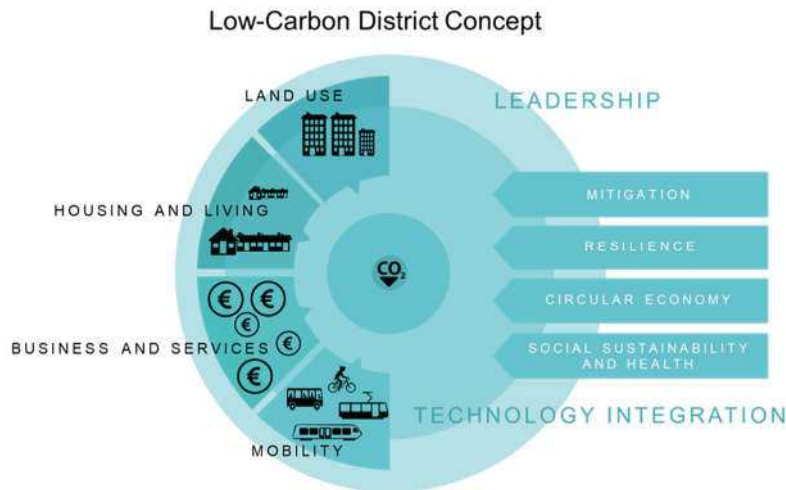
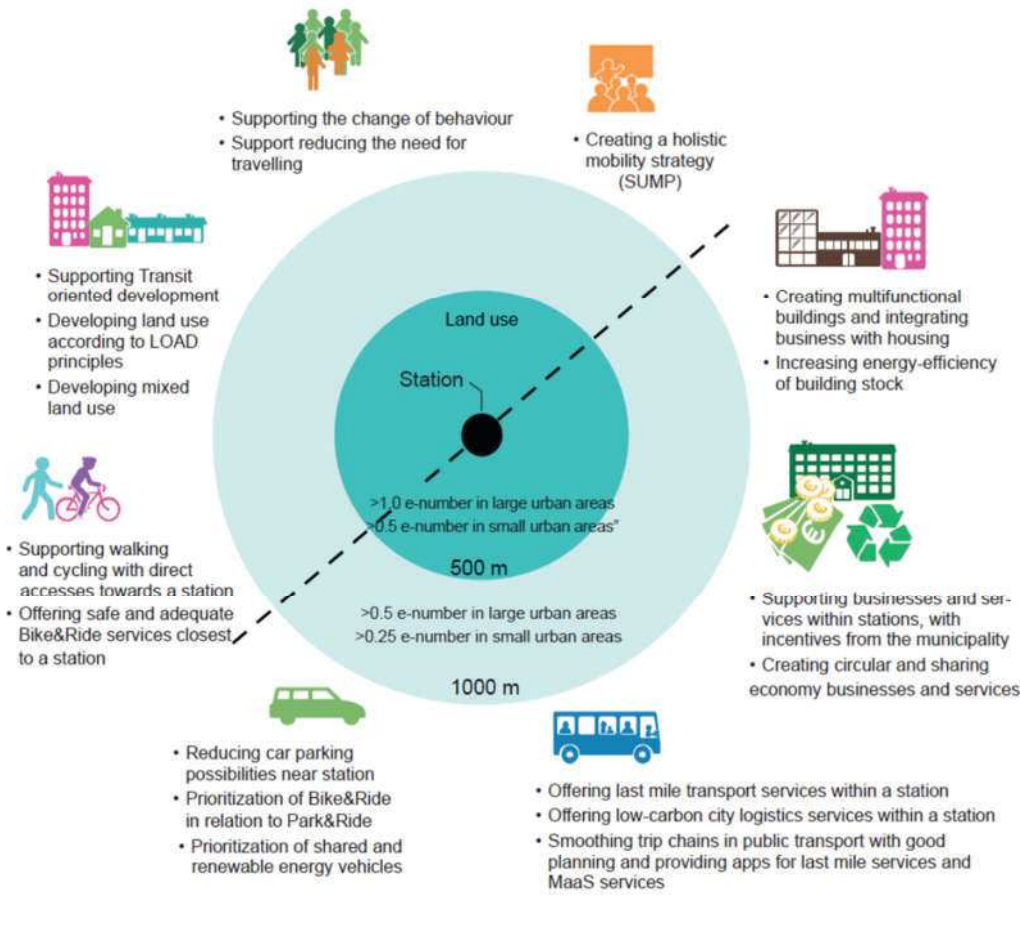


Figure 4: Low-carbon district toolkit for developing climate-friendly station areas.



From a business operational viewpoint, stations have much untapped potential as a marketplace. Improving and strengthening services at station areas will increase the added value of trip chains, will make rail transportation more attractive, and will also reduce the need for travel. Enhancing the service palette of the stations makes people's everyday lives easier and encourages movement toward low-carbon mobility. Last-mile transport services, low-carbon city logistics services, and MaaS services within a station also reduce emissions. A vibrant station area also makes a sharing economy possible. Sharing and circular economies and new models of ownership can be seen as a means to reduce consumption.

The public sector is considered to have a key role in encouraging and facilitating companies to locate themselves close to stations and introduce new types of low-carbon business operations. New business operation models may result from new types of public-private partnerships. The public sector is also seen in encouraging and facilitating the public's initiatives. Social sustainability is an important theme in developing liveable oriented station areas.

If the active development of station-based services is further enhanced, the added value of the trip chains can be strengthened and people can be encouraged to use public transport. Developing station areas as small hubs for city logistics can be part of modern e-commerce and its logistics can be handled in a centralized way to reduce number of trips.

The development of public space and safety are considered key measures for improving station areas. Upgrading public space in particular is the most focused measure to be taken to increase station areas' usability, also from the perspective of safety.

Locating services centrally on ground floors at the station and nearby will also increase social activities and enhance safety. As a minor measure, increasing smart and energy-efficient lighting and enhancing underpasses and overpasses will also increase the feeling of safety.

#### **VI. Managing transportation & VII. Sharing economy:**

The backbone of a metropolitan region's transport system should be public transport, which is one of the most effective and sustainable ways of moving people in metropolitan regions – also in the long term. Public transport should be accessible, reliable, and comfortable, in most cases having electrically driven track-bound modes on the main lines with high capacity. In the long term, public transport should be decarbonized, phasing out diesel buses. However, this is not so easy at the moment because current electric bus operational models face many uncertainties. Currently, electric buses have low ranges and charging requires significant time. Trolleybuses could be a good option, especially in cities, where they are already available, because the basic infrastructure is quite expensive. Nevertheless, metropolitan regions' mobility strategies' target of zero-emission buses by 2030 is contingent upon improving battery and charging technology.

An important option for decarbonizing transport is to enhance walking and cycling as soft transport modes because the cleanest modes are those that do not require any energy except manpower. Even better is to reduce transport needs with appropriate land-use planning, the help of new communication technologies, work from home, and so on.

With the future development of autonomous vehicles, parking problems could be partially solved; however, this will not help reduce road transport. The same also applies to electric cars, which do not reduce congestion. Autonomous vehicles are already available in public transport (mainly in the underground system); tests with autonomous trams and buses are ongoing (Figure 17). Their penetration into individual transport will cause enormous changes in the transportation system, which are not yet fully predictable.

There is a need for integration between the city and region regarding transport management, between different sectors, and also between service providers. A new manner of integration is realized in the Mobility as a Service (MaaS) system, in which a joint platform has been set up to integrate planning and managing trips together with buying and validating tickets.

A future challenge of managing transportation is to find the right mix between various transport modes, shared solutions, and autonomous vehicles in order to cut greenhouse gas emissions and create a liveable urban environment without limiting mobility options.

In the traditional mobility paradigm, the modal split is based on the majority of people using cars, followed by those using public transport, and on a small scale people that walk, bicycle, or use other transport modes.

The sharing economy could be a good way to increase the efficiency of public transport because it allows rapid change of this mobility paradigm: from car ownership to car sharing, from owning a parking space to sharing different parking spaces, and from one solution to go from point A to point B to a multiplicity of solutions in the palm of the hand (on a mobile phone). Public transport, car sharing, carpooling, bicycling, bike sharing, walking, and so on – different transport solutions, different providers, and the flexibility to make the decision on the transport mode according to the needs of each moment and with access to all the real-time information – allow people to make the best choice.

New business models in the sharing economy with their collaborative platforms, using transport digitalization, with access to big data, are changing the way people move. The main outputs of this change should be fewer cars, less congestion, and less pollution.

This allows cities to have much more space dedicated to people than to cars, permitting people to use public space to have fun, to play, to live with each other – in other words, to be happier.

Sharing solutions combined with autonomous vehicles could also be a good solution, especially for low-density areas.

Proper planning and regulation of new (sharing) business models in mobility can supplement existing public transport with new solutions for better mobility and at the same time promote fair competition between different companies, allowing traditional business to thrive in identical conditions as new ones. It is important to never forget that the target is to have fewer cars, and in the majority of cities this requires efficient public transport that allows the transportation of significant numbers of people.

## **Project activities whit stakeholders in the territory of the Metropolitan city of Rome**

The Metropolitan city of Capital Rome (CMRC) following the structure of the project, has involved the most representative local stakeholders starting from the beginning, to connect them to the activities and objectives of the project. Nine formal meetings were organized always with a good number of participants, representatives of the public bodies and transport companies. A good atmosphere of collaboration has been created and it led to a successful outcome of the Rome workshop, which has had a very good relevance on the stakeholders official web sites. Also participation in the international project meetings was effective and, for example the Rome City Mobility Agency used the information gained during the study visit to Oslo to make changes to the plan for the electric mobility of Rome that was about to be prepared.

The stakeholder meetings were also the occasion, returning from the international workshops, to present and share the information gathered, the experiences made, the good practices learned. This modality has made the meetings interesting and always widely attended by stakeholders. Starting from these meetings, in fact, fruitful collaborations have been developed with some stakeholders, involved in the preparation of the SUMP of the Metropolitan City of Rome and in projects on mobility financed by the Italian Government. In particular, working on the SMART-MR project with the Lazio Region allowed to create a path of collaboration around the theme, within the identified policy instrument.

During the various bilateral meetings between the Metropolitan City and the Region, it was possible to evaluate the proper project to be presented as an Action Plan. The Porto workshop has been a useful experience, attended also by representatives of the Lazio region, in which was possible to join the presentation of the “ANDANTE” project (about an integrated mobility ticket used in Portugal) and the “ANDA” project (that integrates infomobility and e-ticketing on mobile devices). During the meeting, it was possible to meet the Portuguese project manager to have further information on the management methods of the projects.

After these meetings and experiences, the proposal to reconsider the policy instrument has been seriously matured with the Lazio Region (that is local authority responsible for ERDF funds). In fact, before signing the application form of the project, the CMRC requested and obtained a letter of commitment to the region to collaborate on the SMART-MR project, considering that the commitment of the funds depended on their operational programs. It is important to underline that Atac and Trenitalia who participated as stakeholders in the project are transport companies involved in the Action plan.

### A list of action leading to greater liveability in European Metropolitan Regions

Field of intervention	Activity	Short-term effects/wins	Long-term effects/wins
Participatory transport planning	Public consultation	<ul style="list-style-type: none"> <li>– New local knowledge and possible tailor-made solutions from stakeholders</li> <li>– Awareness raising</li> <li>– Mutual learning</li> </ul>	<ul style="list-style-type: none"> <li>– Better quality of plans/strategies</li> <li>– Higher public acceptance</li> </ul>
Creating a mobility plan	Promotion and implementation of interventions to organize and manage the demand for mobility of people and goods	<ul style="list-style-type: none"> <li>– Broad commitment to the principles of sustainable mobility</li> <li>– Involvement of relevant people</li> </ul>	<ul style="list-style-type: none"> <li>– Lower environmental impact deriving from traffic</li> </ul>
	Regulation of access in some zones (and/or parking)	<ul style="list-style-type: none"> <li>– Fewer cars</li> <li>– Lower pollution/emissions</li> <li>– Less noise from traffic congestion</li> </ul>	<ul style="list-style-type: none"> <li>– Shift to public transport</li> <li>– Lower environmental impact from mobility</li> </ul>
	Support for intermodal nodes and infrastructure planning for both passengers and freight	<ul style="list-style-type: none"> <li>– Multimodal approach to travel</li> <li>– Optimization of the use of means of transport (more passengers on each means of transport)</li> <li>– Less traffic</li> <li>– Less pollution</li> </ul>	<ul style="list-style-type: none"> <li>– Improvement of mobility</li> <li>– Improvement of resilience of the transport system (through multimodality)</li> <li>– Lower environmental impact from mobility</li> <li>– Better traffic flows</li> </ul>
	Informatization of mobility, provision of real-time data on public transport and traffic; integrated ticketing systems on mobile and personal devices	<ul style="list-style-type: none"> <li>– Optimization and simplification of multimodal travel</li> </ul>	<ul style="list-style-type: none"> <li>– Shift to public transport</li> <li>– Improvement of resilience of the transport system (giving best solutions in real time for travelling)</li> <li>– Lower environmental impact from mobility</li> </ul>

	Promote diffusion of and experimentation with collective services such as car sharing, carpooling, bike sharing, etc.	<ul style="list-style-type: none"> <li>– Optimization and simplification of travel in modal shifts</li> <li>– Fewer cars</li> <li>– Less congestion</li> </ul>	<ul style="list-style-type: none"> <li>– Improvement of mobility</li> <li>– Lower environmental impact from mobility</li> </ul>
	Increase in the size of areas and uninterrupted paths for bicycles and pedestrians	<ul style="list-style-type: none"> <li>– More soft mobility</li> <li>– Fewer cars</li> <li>– Less noise from traffic congestion</li> <li>– Better and healthier quality of life</li> </ul>	<ul style="list-style-type: none"> <li>– Improvement of mobility</li> <li>– Shift to soft mobility</li> <li>– Lower environmental impact from mobility</li> </ul>
Low-carbon logistics	Planning low-carbon logistics <ul style="list-style-type: none"> <li>– Multilevel governance</li> <li>– Involvement of stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>– Shift to low- and zero-emission vehicles</li> <li>– Better use of existing infrastructure</li> <li>– Improved terminal structure</li> <li>– Shared data on freight</li> </ul>	<ul style="list-style-type: none"> <li>– Reduction in carbon emissions</li> <li>– Better air quality</li> <li>– Better acceptance and understanding among all stakeholder groups</li> </ul>
	Low-carbon last-mile pilot projects: <ul style="list-style-type: none"> <li>– Establish consolidation centres for last-mile freight</li> <li>– Transition to e-vehicles in last-mile freight</li> <li>– Transition to bikes in last-mile freight</li> <li>– Extended use of ICT tools</li> <li>– Reduce kerbside parking for private vehicles</li> </ul>	<ul style="list-style-type: none"> <li>– Reduction in freight transport by vans</li> <li>– Better use of existing infrastructure</li> <li>– Modal split in favour of cargo bikes and e-vehicles</li> <li>– Improved efficiency in loading/unloading</li> <li>– Reduction in “search traffic”</li> <li>– Improved accessibility for deliveries</li> </ul>	<ul style="list-style-type: none"> <li>– Reduction in carbon emissions</li> <li>– Better air quality</li> <li>– Better use of existing infrastructure</li> </ul>
	Establish charging infrastructure adapted for freight vehicles (vans)	<ul style="list-style-type: none"> <li>– Transition to e-vehicles in last-mile freight</li> </ul>	<ul style="list-style-type: none"> <li>– Reduction in carbon emissions</li> </ul>
	Establish low-/zero-emission zones	<ul style="list-style-type: none"> <li>– Modal split in favour of cargo bikes and e-vehicles</li> </ul>	<ul style="list-style-type: none"> <li>– Reduction in carbon emissions</li> <li>– Better air quality</li> </ul>
	Managing transportation	Improving mobility solutions	<ul style="list-style-type: none"> <li>– Better mobility options</li> <li>– Accessible, reliable, and comfortable public transport</li> </ul>
	Park-and-ride solutions	<ul style="list-style-type: none"> <li>– Increased parking capacity in station areas</li> </ul>	<ul style="list-style-type: none"> <li>– Decreased congestion in the city centre</li> </ul>

		<ul style="list-style-type: none"> <li>– Fewer cars entering the inner-city area</li> </ul>	<ul style="list-style-type: none"> <li>– Healthier environment</li> </ul>
	Introduction of alternative fuelled buses	<ul style="list-style-type: none"> <li>– Cleaner diesel engines with reduced emissions</li> <li>– Hybrid technology for less fuel consumption</li> </ul>	<ul style="list-style-type: none"> <li>– Zero-emission buses for lower GHG emissions</li> <li>– Healthier environment</li> </ul>
Sharing economy	Promotion of the sharing economy	<ul style="list-style-type: none"> <li>– New and innovative business models</li> </ul>	<ul style="list-style-type: none"> <li>– More mobility solutions</li> </ul>
	Regulating the sharing economy	<ul style="list-style-type: none"> <li>– Fair competition</li> <li>– Integration of new business providers with public transport (mobility as a service)</li> <li>– Allowing and encouraging sustainable new solutions and models</li> </ul>	<ul style="list-style-type: none"> <li>– Sustainable mobility</li> <li>– Wellbeing of people</li> </ul>
	Integrating sharing mobility solutions with public transport	<ul style="list-style-type: none"> <li>– Enables travellers to gain access to public transport on an as-needed basis</li> <li>– Last-mile solutions</li> </ul>	<ul style="list-style-type: none"> <li>– Public transport sustainability</li> </ul>
Transit-oriented development	Definition of “Liveability-Oriented Area Development” (LOAD) methodology	<ul style="list-style-type: none"> <li>– Integration of spatial and transport planning</li> <li>– Co-creation of the neighbourhood</li> </ul>	<ul style="list-style-type: none"> <li>– Higher regional accessibility</li> <li>– Reduction of car use</li> <li>– Reduction of congestion and pollution</li> </ul>
Shaping low-carbon areas	Promoting use of the low-carbon district concept	<ul style="list-style-type: none"> <li>– Lower emissions from the transport sector</li> <li>– Liveability of station areas</li> <li>– New businesses</li> </ul>	<ul style="list-style-type: none"> <li>– Sustainable urban structure</li> <li>– Contributes to achieve regional low-carbon targets</li> <li>– Promoting low-carbon modes of transport</li> </ul>
	Supporting new services in stations	<ul style="list-style-type: none"> <li>– Added value to trip chains</li> <li>– Improved social safety</li> </ul>	<ul style="list-style-type: none"> <li>– Vital and attractive stations</li> </ul>

## The policy instrument

To participate as a partner on the SMART-MR project The Metropolitan city of Rome Capital indicated in the Application form the policy instrument of ROP ERDF Lazio 2014-2020, Axis 4 "Sustainable energy and mobility", Action 4.6.1.'Realisation of infrastructures and nodes of interchange ... ' to work with.

With resolution n.323 14/06/2016 the Lazio Region has approved the "Program Agreement for the integrated sustainable mobility" which assigned the ROP funds for Axis 4 Action 4.6.1. to the city of Rome Capital, for the realization of 10 projects of interchanges parking areas. Unfortunately all this project have not-yet started.

Related to this topic the CMRC has had several meetings with the Lazio Region starting from February 2017 in order to get information on the state of the implementation of the project indicated in that chapter of the ROP, to start to identify a project for the Action Plan

Lazio Region - Regional Directorate "Territory, Urban Planning, Mobility" has always actively participated in the eighth local stakeholders meetings, during which it has been reiterated our necessity to identify a project financed with ERDF funds linked to the creation of interchange nodes.

The minutes of the international workshops report what CMRC underlined: the delay in the implementation of the interchange parking areas programmed. Lazio Region has repeatedly reported as imminent implementation, but in reality the plan is still at an early stage that has been concluded for now with the formal funds allocation to the City of Rome, but no project has yet started.

During a meeting held in September with a manager of the Lazio Region, speaking about the still undefined situation of the projects related to the 4.6.1 action, he proposed an alternative project. This new innovative project for the Action plan, manage directly by the Region, is always under the Axis 4 POR 2014-2020 but is related to the Action 4.6.3 "Intelligent Transport Systems" which provides support for the design, acquisition and realization of an integrated IT systems for our territory. The final goal of this project is the integration of all the information coming from the different transport companies, public and private in a central regional Office (CRI) that will provide the possibility to offer a tariff integration of small and medium companies operating the LPT with a new single electronic ticketing system.

This project will concern, in a first phase, the Metropolitan area of Rome, our area of jurisdiction, so it will be implemented with a close cooperation between the Lazio Region and the CMRC. The project will also have an impact on the arrangement of the updated metropolitan SUMP, on which CMRC is working at in this period, also with the Lazio Region cooperation.

This new project is more interesting and innovative, compared to the previous hypothesis on intermodal nodes, because it will allow a collaboration with the Lazio Region established in the CMRC territory of competence and considering that the period of implementation of the project corresponds to the period of monitoring foreseen by the SMART-MR project.

Therefore, a request was submitted to the leader and the JS to use, as policy instrument, the action 4.6.3 instead of the previously action identified 4.6.1.

Lead Partner and JS have agreed with CMRC the changes requested on the policy instrument plan and then the work on the project of an integrated ticket, called SBE, Sistema di Bigliettazione Elettronico (Electronic ticketing system) has started.

## An overview of directives, regulations and skills on Mobility

### *The European point of view*

The main documents of European policies on ITS are: the 2001 White Paper "European transport policy for 2010: time to decide"; the mid-term review of the White Paper "Keep Europe moving - sustainable mobility for our continent"; the White book "Roadmap to a single European transport area - For a competitive and sustainable transport policy" of 2011; The Directive 2010/40 / EU of 7 July 2010 and the ITS Action Plan of December 2008.

The Operational Program of the Lazio Region - ERDF - European Regional Development Fund 2014-2020 includes among the various contributions to the Union strategy for a smart, sustainable and inclusive growth and the achievement of economic, social and territorial cohesion. In the priority axis 4 - Sustainable energy and mobility it is clearly explained that investments are a priority; as well as that the Program tends to promote a low-carbon strategies for all kinds of territories, in particular the urban areas, including the promotion of a sustainable multi-modal urban mobility and the relevant implementation of adaption and mitigation measures aimed at pursuing the general objective of coping the climate changes, also through the mobility decongestion.

### ***The national level***

At national level Italy implemented the ITS Directive 2010/40/EU through the decree-law of October 18th 2012 n. 179 converted, with modifications, into law of December 17th 2012 n. 221 "Further urgent measures for the growth of the country, in the context of art. 8 - "Measures for the innovation of transport systems".

The Italian government, moreover, is delegated by the parliament, has adopted the Interministerial Decree of 1 February 2013, entitled "Dissemination of six intelligent transport systems (ITS) in Italy", which constitutes the methodological and operational basis of the National Action Plan of February 2014

### ***Regional competencies***

The regional mobility plan updates and outlines the forecasts of the previous planning instruments, including the passenger basin plan of the province of Rome, outlining which are the railway infrastructures that affect the metropolitan area and the potentials that can be achieved through an adaptation of the trains and a rationalization and strengthening of the road transport-iron exchange nodes.

The guidelines for the drafting of the Regional Transport and Logistics Mobility Plan (PRMTL), define for the Plan the possibility of identifying policies, strategies and instruments that would allow the sustainable growth of the territory, in order to achieve some main objectives indicated by the European Union.

It is essential for the revitalization of the transport sector, in terms of competitiveness, that the Region, as foreseen by the title V of the Constitution, assumes a strongly proactive role by adopting an integrated vision of the Lazio mobility system through the Regional Transport Mobility Plan and Logistics (PRMTL) the main instrument of regional planning. The plan is drawn up in cooperation with the National authorities and in consultation with the other regions and with Rome Capital.

The plan therefore studies and defines an integrated system of smart mobility that would allow to reduce the environmental impact caused by harmful emissions caused by transport and to improve the quality of life, thought an integrated transport system between the city of Rome, its metropolitan area and the regional territory.

The plan enhances the vocations of the places, decentralizes the functions and the development centres in the municipalities in order to reduce the movement needs. It represents a coordinated investment plan on sustainable mobility. This allows to achieve rapid strategic results in some case already undertaken through the upgrading and the modernization of existing instruments and infrastructures, offering a transport system able to guarantee current and future demands and initiatives that can improve the efficiency, the integration and the sustainability of general transport.

In particular, the reorganization of local LPT and passenger intermodality cannot be separated from the rationalization of service contracts and the improvement of efficiency for the managing companies. The LPT must be planned with a view to intermodality in order to achieve integration between private and public transport and the integration of iron and road transport systems, improving the access to railway stations and bus stations by verifying the offer of car parking in these nodes. and planning an efficient bus network to add to the railway network.

Furthermore, as regards the infomobility sector, the Lazio Region approved the regional infomobility plan in February 2008, closely integrated with the Regional Mobility Transport and Logistics plan, with the aim of



promoting the development of six ITS systems in the Region Lazio and providing a guidance for the implementation of telematic services and tools to support transport management.

### ***Rome Capital***

The New General Plan of the Municipality of Rome approved by City Council Resolution no. 18 of 12.02.2008 identifies the routes for the rationalization of public transport services and passenger intermodality conditions that are realized through the General Urban Traffic Plan (PGTU) whose scenario includes the following interventions:

- Intermodal upgrading: creation of effective rubber-iron exchange nodes, coordination of on the road service time with the railway one;
- infomobility enhancement: integrated regional electronic ticketing system, integrated infomobility platform;
- extra-urban LPT: strengthening intermodality and the primary role of the railway network;
- LPT in Rome: redefinition of the road transport network with other more effective services, favoring interventions on the tram network, reducing the road transport long routes and eliminating the overlaps, strengthening of the iron intermodality, checking the service regularity and informing the users.

The commuter traffic from and to Rome is accurately represented in the new Rome PGTU. In the decade 2004-2013, it was detected an increase in commuter mobility of 50%, growth linked both to the aging of the resident population and, in particular, to the displacement of the younger population towards the economically more accessible areas of the Metropolitan Area.

The same plan describes the measures related to ITS, according to an integrated approach to the overall theme of mobility which includes measures such as improving the efficiency of the system as tools to support the optimization of already existing resources (road network and collective and/or alternative transport) and, moreover, as a way to convey updated and complete information to end users (infomobility).

***The Metropolitan city of Capital Rome*** The Passenger Basin Plan approved by the Provincial Council of Rome on 15.11. 2007 had analyzed the local public transport system in the Lazio Region "hoping that the individual municipalities adhere to an integrated system allowing users to use a single travel ticket for public transport services within their territory and for the services of regional public transport".

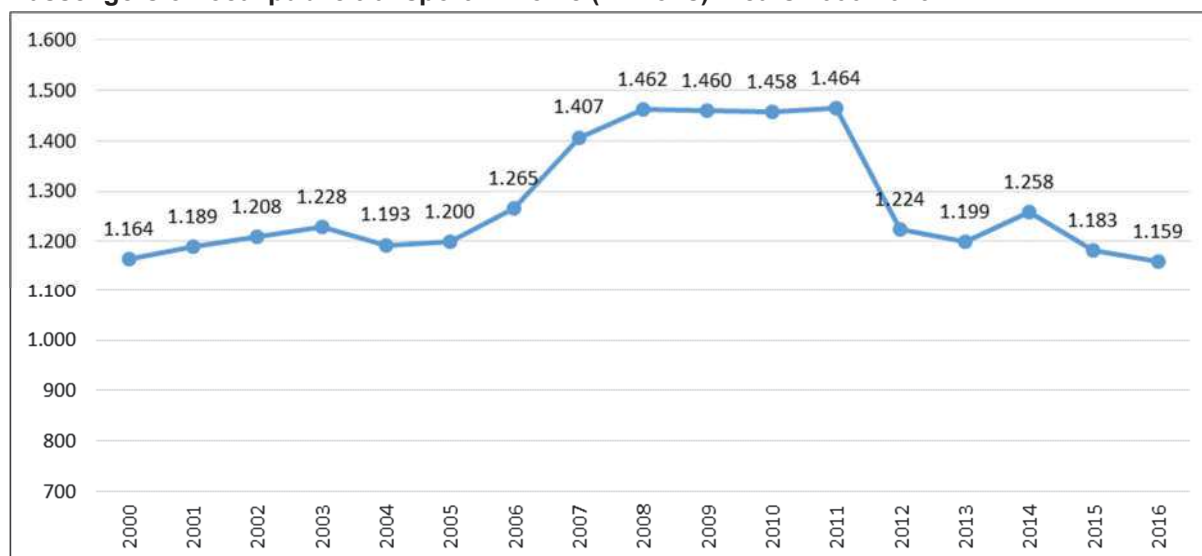
The Provincial Territorial General Plan (PTGP) approved by the Provincial Council of Rome in 2010, with regard to the Mobility System: transport networks and services, sets the following objectives:

- Improving the accessibility of the entire provincial territory to the large road and railway network to increase regional, national and international relations
- Improving the internal accessibility of the provincial territory in a differentiated way, promoting the necessity to increase metropolitan relations.

Other objectives include improving efficiency and improving collective transport, improving safety, environmental sustainability and networks, limiting the growth of individual mobility, improving the economic efficiency of collective transport and its social sustainability.

The Metropolitan City of Rome Capital is currently involved in the preparation of the Sustainable Mobility Urban Plan (SUMP) pursuant to the Decree of August 4, 2017 of the Ministry of Infrastructure and Transport. The SUMP must have as main objectives the improvement of accessibility of urban and peri-urban areas, through sustainable and high quality mobility and transport systems, also from an economic and social environmental point of view and the improvement of the usability of the public space.

**Passengers of local public transport in Rome (millions). Years 2000-2016**



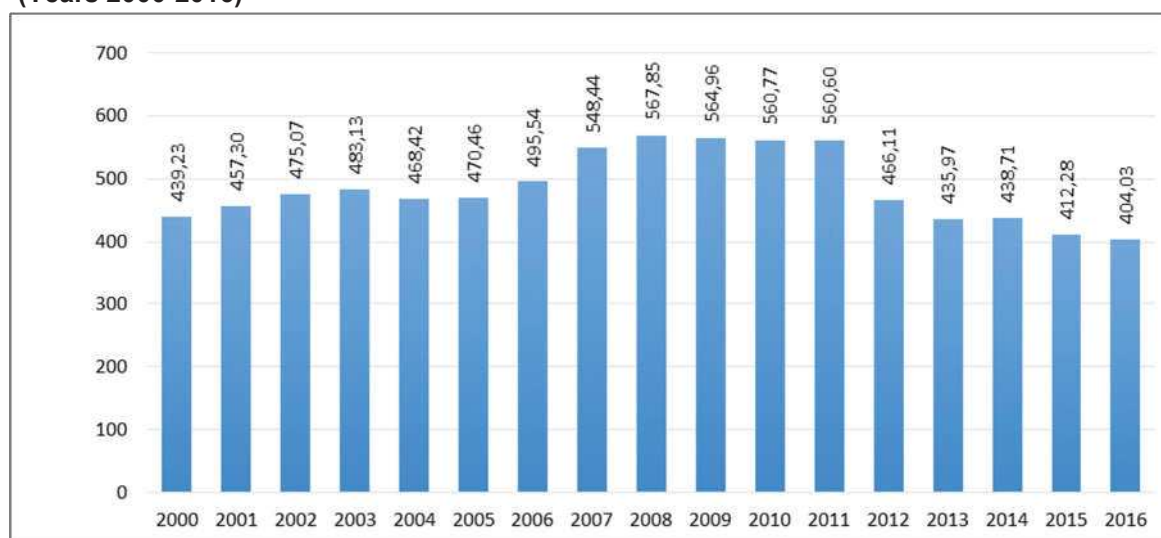
Source: Statistics of the Metropolitan Statistics Office on ISTAT data - Environmental data in cities

The Guidelines identify a list of macro objectives relating to the following areas of interest: a) effectiveness and efficiency of the mobility system; b) energy and environmental sustainability; c) road safety security; socio-economic sustainability. The macro objectives will be achieved through the selection of certain strategies through the application of a list of actions.

In particular, "the use of ITS and infomobility systems to promote the integration of transport systems, for the provision of data on the urban priority network and for the development of innovative mobility services" is promoted, corresponding to the "Integration of transport systems".

The project will invest the territory of the entire metropolitan city of Roma Capitale, which brings together 121 municipalities on an area of 5,353 sq. Km where 4.3 million inhabitants live. The area of intervention is concentrated on all the municipalities with the exception of Roma Capitale within which a Local Public Transport service (LPT) is provided. The resident population directly served by the LPT service, with the exception of Roma Capitale, is over 1,335,000 units.

**Ratio of number of passengers transported by LPT and average resident population in Rome (Years 2000-2016)**



Source: Statistics of the Metropolitan Statistics Office on ISTAT data - Environmental data in cities

In particular, 58 municipalities with LPT service have been identified compared to the number of 25 companies offering the service this because some transport companies carry out the service on several municipalities.

From the study "Mobility and commuting" of the Metropolitan Statistical Office, it is clear that the use of private transportation means prevails in the metropolitan city of Rome.

The fleet of vehicles circulating in the Metropolitan city of Rome is constituted in 2016 by 3,499,806 vehicles of which 76.7% consisting of cars and 14.9% of motorcycles. Compared to the resident population and therefore considering the motorization rate, 80 vehicles per 100 inhabitants circulate in the metropolitan city of Capital Rome.

Nearly 1.8 million passenger cars circulate in the capital, representing 65% of the cars in circulation in the entire metropolitan area with a density of 1,369 cars per sq. Km. The motorcycles are about 400,000, 75.9% of all those circulating in the metropolitan area.

As for the local public transport of Capital Rome is entrusted to ATAC and Roma LPT. The lines on which ATAC vehicles are used are 260 (250 of which are related to buses, trolley buses, or electric buses and the remaining 10 relating to trams and metro) to which are added 103 lines managed by Roma LPT (28.4% of total). The length of the local public transport network in 2016 was 2,369 km in total, of which 2,301 km related to the surface network and about 59 to the metropolitan network.

The number of local public transport stops in Rome in 2016 was 8,463, of which 74 were metro stops and 8,389 surface stops (36 of which are outside the municipal area).

Although commuting flows (daily movement of people from the municipality of residence for work or study and carried out mainly by private cars, train and bus) in the Roman metropolitan area, the analysis of the 2011 census data shows that commuters residents in the metropolitan city of Capital Rome amounted to 2,037,280 (equal to slightly more than half of the residents) of which 65.7% were allocated to Capital Rome while the remaining 34.3% in the 120 municipalities of metropolitan hinterland.

## 2. Action *(please list and describe the actions to be implemented)*

As part of the promotion and development of Intelligent Transport Systems (ITS), the Lazio Region intends to set up a LPT service center through the creation of an integrated, interoperable system based on shared and non-proprietary technologies, open to the insertion of new regional LPT operators, envisaging the subsequent transfer of the management of the entire Metrebus system (metro lines and bus lines) to the Lazio Region itself. The project will be carried out through the regional road company Astral S.p.A..

The project consists of the development of two interventions, "Electronic ticketing system (SBE)" and "Infomobility", with the aim of smoothing vehicle traffic by strengthening the current in/out of the metropolitan area, reducing waiting time, road accidents and the use of private vehicles and consequently the mobility decongestion.

This Action plan concerns in particular the "SBE" project that consists in the installation of new on-board regional deposit systems and territory in the perspective of complete dematerialisation of the travel document, with an extension to the metropolitan area companies of the software that oversee local and central management.

While the "Infomobility" intervention consists in the development of the information systems expected for the main modular functions integrated on the territory of the metropolitan area of Rome, in order to permanently and continuously involving the urban territory outside Rome in informing users of the LPT and of private traffic.

In the general area of infomobility, the specific development of information and communication technologies in recent decades has deeply influenced the recent innovations of the transport system (ITS).

Intelligent Transport Systems (ITS) are a tool that allows to manage mobility in a "smart" way and represent the fundamental tool for achieving the goal of a fully integrated transport network.

The need to think of transport as an integrated system arises from the transformation of passenger and freight transport demand models that have occurred over the years. This caused an increase in the traffic congestion with a consequent negative impact on the environment, quality of life and safety.

Through the use of ITS is possible to reduce travel times, to increase network capacity, to reduce the number of accidents, the traffic congestion, the polluting emissions and the energy consumption in the face of relatively modest investments.

The monitoring of vehicles equipped with GPS and internet connected allows a real-time delivery of information to users and the creation of dynamic systems for traffic regulation and fleet monitoring.

Furthermore, at the moment traffic information is not integrated and does not foresee the network future status, nor is it customized to the specific needs of the individual user and there is a lack of coordination between the control of the extra urban road network and the control of the regulation of urban networks.

In the near future, the growing development of communication technologies, of the identification and the localization techniques, the creation of networks between vehicles and objects (internet of things), will allow to transfer to the physical world those characteristics of accessibility and interconnection that today are an exclusive of the digital experience.

The regulation and control systems can take advantage of the continuous and individual monitoring of vehicles, objects and actuators. The further progress of information technology will allow the development of integrated networks of multifunction sensors (fixed or mobile) for traffic and energy control (eg regulation of intersections with individual vehicle-infrastructure and vehicle-vehicle communication), for the payment functions of the services and for the provision of context-dependent and personalized information. The dissemination of technologies will increasingly facilitate the exchange of transversal information between users (crowdsourcing). This form of collective intelligence, parallel and independent from the information and public system control can be integrated with it and used in a synergic way on the different levels of planning, designing and dynamic managing of the system to create a transport system effectively smart.

***The origin of Integrated Ticketing System in the Lazio region.***

The idea of creating an integrated system of travel documents within the Lazio Region was born in 1994 with the first constitution of a "Metrebus" Consortium between Cotral, ATAC and Ferrovie dello Stato (former Trenitalia). A first agreement was signed on 29/11/1994 (renewed on 23/12/1997) between the members of the Metrebus Consortium which gave ATAC a representative mandate for ticket management and revenue distribution. Following a public tender, Atac signed a contract with ERG Limited Company for the design, implementation, management and maintenance of an open automatic fare system (SBE) for the network of the Metrebus travel tickets in the territory of Rome and Lazio. Actually all the SBE systems are owned and managed directly by the public transportation companies [ATAC, COTRAL and TRENITALIA (as owner of its domestic system integrated with the regional SBE)]

In 2001, the Electronic Ticketing System of the Municipality of Rome was completed and started into operation. The SBE architecture and software structure of COTRAL implemented during 2007, as described below, and is actually in full operation.

The Lazio Region, as a result of the powers granted by the modification of the TITLE V of the Constitution, is the competent authority in the field of local public transport and performs the functions and tasks that require a unitary exercise pursuant to Regional Law n. 16 of 16/06/2003, including the tariff system and the electronic ticketing system (SBE).

The technical standards of the electronic ticketing system were defined by Deliberations of the Regional Council and it was established that the companies carrying out local public transport in the Lazio Region had to comply with the standards. A mandate was given to proceed immediately to the activation of an electronic ticketing system at a regional level (SBR) that can be integrated with that one of ATAC which was already operational in the Municipality of Rome, using the same supplier used by ATAC.

The project "Completion of the electronic ticketing system (SBE) for regional public transport" therefore restarted and was financed by the ERDF 2007-2013 ROP funds "to realize the operational/management part and the installation of the sales and validation equipment of that part of the system inherent to the territory of the Lazio Region and the central clearing system, for an amount of € 20,500,000.00 plus VAT.

The Lazio Region is a mediator between the beneficiary COTRAL, the future owner, and ATAC, the contract manager in favour of COTRAL. The contract includes:

- a) Sales sub-system, consisting of 1,200 sales terminals to be installed in businesses located in the territory of the RL and prepared to issue magnetic tickets and to recharge electronic cards;
- b) On-board subsystem, consisting of 1,627 devices to be installed on COTRAL fleet vehicles and prepared for validating magnetic tickets and electronic cards, locating vehicles, communicating via radio with deposits and communicating via GPRS in "real-time" with the COTRAL operations center and with the Clearing System;
- c) Deposit sub-system, consisting of 48 devices to be installed in the COTRAL organization's depots located in the territory of Lazio Region and prepared to communicate with vehicles (through the installation of two or more Wi-Fi antennas);
- d) Inspection subsystem, consisting of 100 control handhelds for inspection personnel;
- e) Control sub-system installed at COTRAL consisting of a set of electronic servers and archives and magnetic archives;
- f) Service subsystem, consisting of 5 machines set up for the renewal and issue of smart cards to customers;
- g) Licenses for use of the Base Software and the Business Application Software up to the date of completion of the system under the terms of art. 18;
- h) Clearing system, consisting of a set of electronic servers designed to perform the clearing functions of the various service providers and the centralization of shared data.
- i) Update of the ATAC platform to allow the integration of the ATAC ticketing system in the Regional Clearing system.

The Electronic Ticketing System is the essential tool for planning regional transport services because it assures a constant and automatic control of demand, quality, regularity and punctuality of the services offered to citizens. The Lazio Region has delegated its in-house company Astral to create a Local Public Transport Service centre by an integrated, interoperable system based on shared and non-proprietary technologies, open to the inclusion of new regional LPT operators since the management of the Metrebus system is expected to be transferred to the Lazio Region by 2019.

Actions to be implemented to fight climate changes through the decongestion of mobility and with Investment Priority and "Promoting low-carbon strategies for all types of territory, especially urban areas, including the promotion of sustainable multi-modal urban mobility and relevant adaptation and mitigation measures" are identified as part of the ROP ERDF Lazio 2014-2020, Priority Axis 4 – Sustainable energy and mobility, Action 4.6.3 "Intelligent Transport Systems".

With the 2014-2020 ROP ERDF funds are financed in the amount of € 3,000,000.00:

- upgrade the software systems of the regional RCC (Regional Clearing Centre) system with a view to the dematerialization of travel documents,
- extend to the carriers of the Metropolitan Area the equipment and the software for the local and centralized management of the SBEs (SPCCpo),
- supply and install on the vehicles of the LPT carriers operating in the municipalities of the Metropolitan Area of Rome the on-board, deposit and territory systems of the SBE.

***Territorial framework:***

The ROP ERDF project focusses particularly on the 120 municipalities of the Metropolitan Area excluding Capital Rome that has its own LPT service.



Metropolitan City of Capital Rome territory

**Articulation of the project**

The project foresees the completion and the update of the hardware and software infrastructure of the SBE Management Center (RCC - Regional Clearing Center) currently under development by the CED of the Astral S.p.A. and the installation on vehicles/ depots belonging to the different operators of the LPT of adequate on-board systems for reading electronic tickets, contactless bank cards and smartphones (and where necessary and

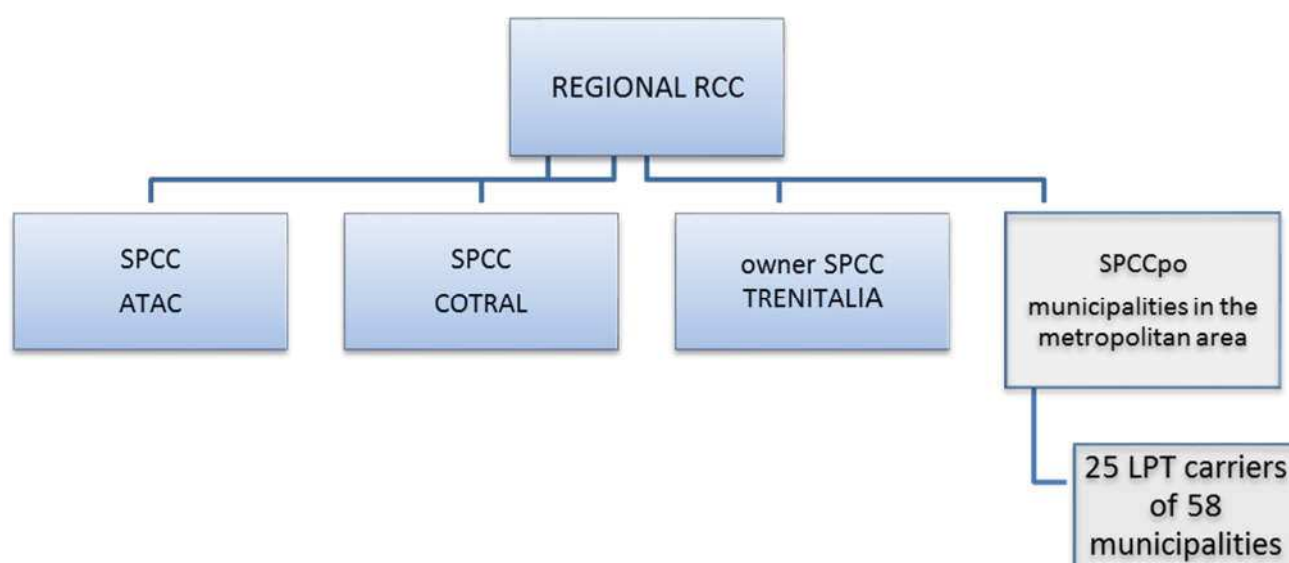
appropriate for paper tickets), with the objective to start the process of the dematerialization of the travel documents.

The completion of the IT infrastructure is the basis for the evolution of the Metrebus Tariff Integration System and of the features expected by the upcoming multi-functional cards of the regional services.

Preparation and extension of the SBE systems to the Metropolitan Area of Capital Rome and the activities planned for infomobility will guarantee an efficient and effective system of adduction starting from the municipal LPT to the regional carrier lines, both on iron and on rubber.

The project in addition to providing for the supply and installation of on-board systems must include the hardware (intermediate servers and storage devices) and software for the business logic for managing interoperable and integrated travel documents.

The project is completed implementing an appropriate control centre subsystem for each operator involved to allow them to govern sales, control and verification systems (SPCC – Service Provider Control Centers), as well as the station systems, stop, deposit and on-board systems of its own competence, according to the diagram below.



Lazio Region is expected to include all the Municipalities of the Metropolitan Area of Capital Rome involved in LPT services, through the activation of a participatory process, to optimize the aforementioned investments.

Lazio Region will get the above-mentioned systems through ROP ERDF funding and will make them available for free to the operators in order to accelerate the expected economic and financial returns of the investment through:

- The tariff integration of the entire metropolitan area;
- Modal integration: interoperability between the different operators of the LPT and facilitation of the modal exchange between private and public mobility, also by using park and ride areas.

It is essential to collect data from the front-end system of the service concessionaire carriers in the Lazio Region until now lacking an electronic ticketing system (SPCC) and for this reason not monitored accurately by the regional system.

The SBE project is organized into three phases:

- Implementation of Regional Clearing Center, with the future aim to manage all the data and the operations related to public transport in Lazio;
- Implementation of Service Provider Clearing Center for Small Operators (SPCCpo), realizing some intermediate centralized systems to permit a widespread management of data and operations with central coordination by the RCC;
- Implementation on LPT vehicles of SBE devices, as described above.

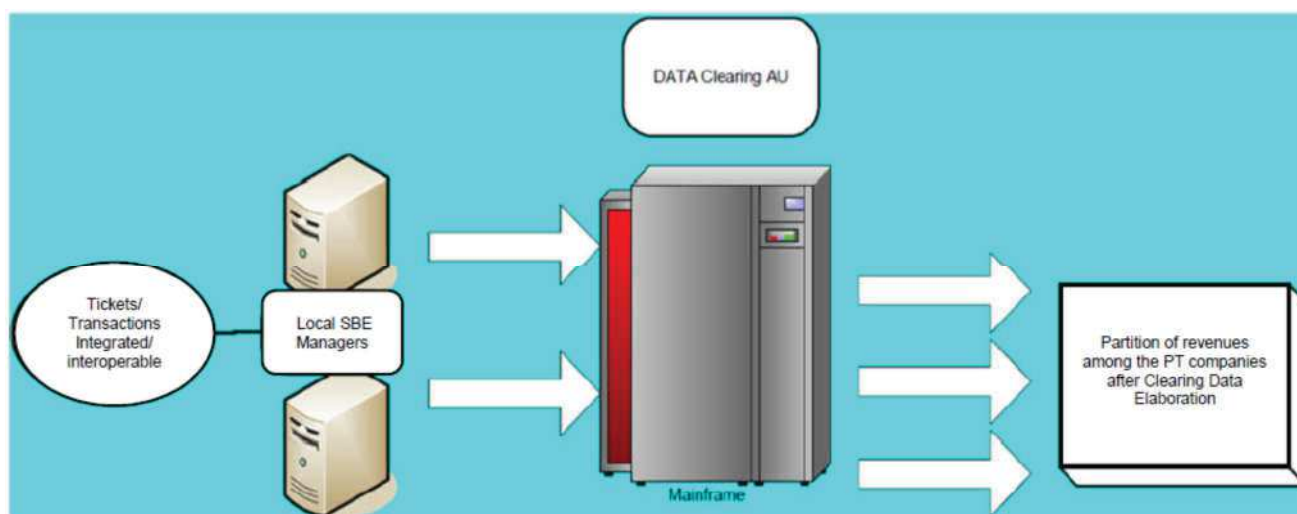
### Evolution of the RCC\_SBE systems

The SBE project was born before the start of SMART\_MR, but interesting contacts between the MCCR and the Lazio Region also occurred from the Rome Workshop in 2017 and went on till today. The SBE project is based on the idea of ticket integration, but is a new project because it involves a wider concept, i.e. the creation of a regional central system for collecting and managing of tickets data, with also clearing and settlement processing functions, also including in the system (for the first time) private LPT companies in the metropolitan area of Rome.

The technical details of the project needed a 2-years period of interaction between all the players involved. As also reported in the Deliberation of the Council of the Lazio Region n. 37/2019, some corrections and additions have been made up to the latest version of the project, described in ASTRAL S.p.A. Note n. 37140 of 6 December 2018. The MCCR, according with Lazio Region, will participate and support the implementation of the activities and during the monitoring phase of SMART-MR, guaranteeing a contribution with the skills acquired with SMART-MR as regards to participation, holistic approach etc.

The Lazio Region defined the communication standards to be adopted to interoperate with the regional RCC and took upon itself the rationalisation of the whole system for a centrally coordinated widespread management. The regional LPT concessionaires need a currently missing centralised intermediate system to interoperate with the regional RCC since now they have only contractual relations with the single municipalities.

Following this strategic vision, the centralised system defined with the acronym SPCCpo (Service Provider Clearing Centre small operators) has to be installed to play the role of an interface with the regional RCC system.



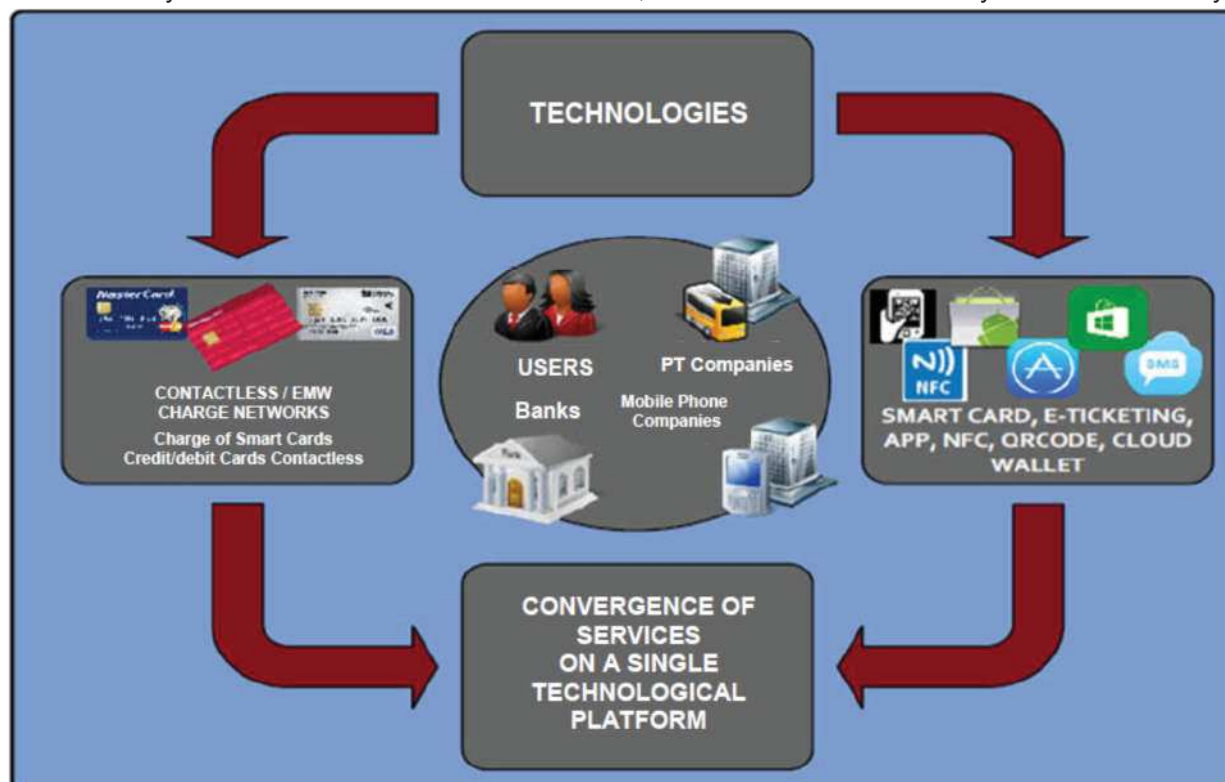
### The future upgrades of the RCCT software

The currently identified upgrades that are going to be implemented in the next phase will be the following:

- 1) increase in direct sales channels
  - Creation of a centralized system for sale on web and mobile channels (remote POS)
  - Creation of a WEB-POS application for the sale on WEB channel and recharge of the titles of contactless travel through USB devices, for large customers.
  - Creation of a "Mobile Store" network on Smartphones based on NFC and QRCode technologies to allow the simultaneous sale of tickets and recharge of smart card.
- 2) integration and interoperability of existing circuits
  - Creation of a centralized system allowing access to public transport through the use of contactless support issued by other bodies / circuits (identification cards of security forces, Cartafreccia Trenitalia, etc.)
- 3) Opening to emerging and new payment systems:



- Creation of a centralized system that allowing access to public transport using contactless payment instruments systems such as EMV credit / debit cards, such as MASTERCARD PayPass and VISA Paywave



### Expected results

Evolution of the SBE software in in the Lazio region as part in the framework of the implementation of the ITS systems to achieve tariff integration and complete dematerialisation of travel documents, transfer of data in a single integrated database ensuring a complete interoperability between different operators of the LPT of the Metropolitan and Regional Area. The introduction of a single regional title (TUR) and facilitation of modal exchange between public, private and shared mobility as well as the use of park and rides will cause a reduction of the private transport mode in favour of the public and this decongestion of mobility will support the fight against climate change.

3. **Players involved** (please indicate the organisations in the region who are involved in the development and implementation of the action and explain their role)

Lazio Region charged regional road company Astral S.p.A. with realising the project of SBE.

Lazio Region as central superordinate Authority governing all the SBE systems operating by public and private companies (including the small municipalities carriers).

4. **Timeframe** (the times of the various phases)

Phase of the SBE (Electronic Ticketing System) project	Progress March 2020	Progress March 2021
1. Implementation of Regional Clearing Center	100%	-
2. Implementation of Service Provider Clearing Center for Small Operators	100%	-
3. Implementation on LPT vehicles of SBE devices	50%	100%

5. **Costs** (if relevant)

Phase of the SBE (Electronic Ticketing System) project	Costs
1. Implementation of Regional Clearing Center	€ 400,000
2. Implementation of Service Provider Clearing Center for Small Operators	€ 500,000
3. Implementation on LPT vehicles of SBE devices	€ 2,100,000
<b>Total amount</b>	<b>€ 3,000,000</b>

6. **Funding sources** (if relevant):

The project SBE was approved in the Lazio Region ROP ERDF 2014-2020.

The funds dedicated to the different phases of the SBE project are already secured by Lazio Region Council Deliberation n. 37 (January, 29 2019), published on Regional Bulletin n. 13 on February, 12 2019, where Astral S.p.A. (in house Society of Lazio Region) has been appointed with fulfilling the project.

Date: 09/07/2019

Signature: 



Stamp of the organisation (if available): \_\_\_\_\_