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New scenarios for safe mobility in urban areas

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Urban regeneration to enhance sustainable mobility

The 2018 Call for proposals of the Emilia-Romagna Region

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Abstract
Urban regeneration processes represent an opportunity to pursue a sustainable city model. From a sustainable city perspective, the contribution to the redesign of public space and mobility infrastructures and to the improvement of pedestrian and cycle accessibility to local public services is undoubtedly significant. Within this framework, the Italian Region of Emilia-Romagna, promoted an Urban regeneration Call in 2018 to which cities submitted project proposals concerning the redevelopment of both architectural emergencies and public open spaces, paying particular attention to sustainable mobility issues. About 100 proposals have been submitted and several municipalities received funding. This paper analyses in particular the proposals submitted by the provincial capital cities, through a comparative approach, focusing on mobility, accessibility improvements and open space redevelopment. The aim is to highlight similarities and differences in order to identify some common guiding principles for enhancing sustainable urban mobility.

Keywords
Sustainable mobility; Urban redevelopment; Urban regeneration; Public spaces.

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1. Introduction

Urban regeneration aims at rehabilitating impoverished urban contexts by large scale renovation projects or the reconstruction of buildings and urban spaces, involving comprehensive and integrated actions which seek to solve urban problems and bring lasting improvements in the economic, physical, social and environmental condition of an urban area. It is nowadays clear that urban regeneration processes represent an opportunity to pursue a sustainable city model and, in this perspective, the redesign of public spaces and mobility infrastructures (see, i.a., Tiboni et al., 2021, Congiu & Plaisant, 2018; Caramona et al., 2003; Gonzalez-Urango et al., 2020) becomes rather significant, comprising the enhancement of pedestrian and cycle accessibility (Tight et al., 2011; Banister, 2008; Vasilev et al., 2018; Vale et al., 2016) to public amenities for all users, including the most vulnerable ones (see, i.a., Campisi et al., 2020; Gaglione et al., 2019; Guida & Carpentieri, 2021; Ignaccolo et al., 2020; Tira, 2018). The theme of sustainable urban mobility is one of the issues addressed by the United Nations 2030 Agenda (2015), in particular by Goal 11 "Sustainable cities and communities", and it has often been already declined in the urban planning practice by the Sustainable Urban Mobility Plans.

Also referring to Italian policies described in the most recent and advanced documents on this topic (ASviS 2017; Ombuen, 2017), actions to promote sustainable mobility and urban regeneration relate to many of the SDGs, aside from n. 11: n. 3 (good health and well-being), n. 7 (affordable and clean energy), n. 9 (industry, innovation and infrastructure), n. 13 (climate actions).

Within this framework, the paper aims, firstly, at highlighting how accessibility and slow urban mobility are involved in recent urban regeneration interventions promoted by public administrations in Emilia-Romagna, an Italian region that recently adopted a new urban planning law (L.R. n.24/2017) which gives particular emphasis to urban regeneration and sustainability, and secondly, at monitoring the actions carried out by the public administrations to achieve European initiatives on sustainable mobility.

This study is engaged in finding answers to the following questions. Is the issue of sustainable mobility generally integrated in recent urban regeneration projects? Do regeneration interventions increase accessibility levels or just take advantage of existing accessibility conditions? How the interventions aim at enhancing walking and cycling connections? What relationship do projects have with the strategies promoted by Sustainable Urban Mobility Plans in force?

To answer these questions, the paper examines a set of urban regeneration projects submitted to the Emilia-Romagna Urban Regeneration Call for proposals, launched in 2018, at financing regeneration strategies for qualifying public spaces, reusing the existing building stock and achieving zero soil consumption. The paper investigates in particular the proposals of the main regional medium-sized cities focusing on open space redevelopment and sustainable mobility measures, like improvements in slow mobility infrastructures, enhancement of safety conditions, and equity in accessibility also for vulnerable users.

The study is developed as a comparative analysis of the projects' main features, such as funding sources, location, proximity to the city center or to public transport and shared mobility nodes; promoted actions, especially apt at implementing or redesigning slow mobility infrastructures. The goal is to highlight similarities and differences, including the resulting impacts on accessibility, safety and equity conditions for all the involved social groups of road users, in order to identify some common guiding principles towards a more inclusive and safe urban mobility. Finally, the paper investigates the indicators proposed by public administrations to monitor and assess the overall urban improvement trying to highlight their efficiency.

The paper is structured as follows. Chapter 2 provides an overall presentation of the Emilia-Romagna Regeneration Call, and highlights the different funding sources (municipal, regional, national and also private) that are contributing to the implementation of the proposed projects. Chapter 3 introduces the analysed regeneration projects and provides a comparative analysis of their main characteristics, including accessibility to the area by different means of transport. It also describes, with a specific focus, the experience of the city

of Parma. Chapter 4 presents the indicators that have been set to assess the regeneration projects discussing also the urban and regional strategies in which projects are framed. Indeed, financed urban regeneration projects often form pieces of broader strategies, also promoted by SUMPs, to improve livability and accessibility levels for tourists and citizens. Finally, conclusions (chapter 5) try to outline and sum up some guiding shared principles of the sustainable mobility strategies in the different proposals, highlighting possible synergies with existing SUMPs.

2. Urban regeneration strategies in Emilia-Romagna medium-sized cities: from National policies to a Regional Call for proposals

The Emilia-Romagna Region, with its recent Urban Planning law (L.R. 24/2017), confirmed a planning approach based on urban regeneration processes and on reduction of land consumption, rather than on urban expansion.

In line with those principles, the Region launched a specific Call for proposals in 2018 (DGR n. 550/2018), within the Operational Plan of the Infrastructure Development and Cohesion Fund 2014-2020, aimed at financing and boosting the regeneration of impoverished urban contexts. Each municipality had the opportunity to submit urban regeneration project proposals (also in partnership with other authorities). 112 proposals have been submitted, and with an overall budget of about € 41 million, the Call then provided funds for 43 municipalities.

Two main funding sources were involved: FSC (*Fondo per lo sviluppo e la coesione),* a development and cohesion fund for the construction or redevelopment of public facilities, and CDP (*Cassa Depositi e Prestiti*) funds aimed at supporting social housing policies and related territorial facilities. The Call required the setting up of a regeneration strategy covering a large area, potentially already identified by municipal urban plans, and a financial participation in the projects between 30% and 50%.

In addition, the Call gave particular emphasis on mobility issues, on the regeneration of degraded and unused networks, and on the implementation of slow mobility and intermodality, with the aim of pursuing environmental sustainability and the reduction of GHGs emissions, according to the European policies and initiatives, such as the Covenant of Mayors (2008), the Europe 2020 Strategy, and the most recent European Green Deal (2019).

The 43 projects funded are distributed as summarized in table 1. The other 69 applications submitted to the call for proposals were not accepted.

Province	Projects funded
Bologna	10
Piacenza	2
Parma	5
Reggio Emilia	5
Modena	6
Ferrara	4
Ravenna	5
Forlì	4 (including the municipality of Cesena)
Rimini	2

Tab.1 Total projects funded by the Regional Call, by Province

All the provincial capital cities (medium-sized cities) received funding, except for the city of Piacenza that submitted a proposal for an intervention located in the historical center. However, another proposal in the Province of Piacenza has been funded. It is a pilot project submitted by the Union of Municipalities of Pontenure, Alseno, Cadeo, Calendasco, Fiorenzuola d'Arda and Gragnano Trebbiense which aims at

regenerating and enhancing the historical and cultural pilgrim route *Via Francigena,* in line with the strategies of the Council of Europe on "Impact of European Cultural Routes on Small and Medium-sized Enterprises' innovation and competitiveness". This project will be analyzed in the paper.

Generally, several of the medium-sized cities financed proposals, derive from plans and projects developed in the framework of the previous National Call "Extraordinary intervention programme for urban regeneration and safety in the suburbs of metropolitan cities and provincial capitals" (*Programma straordinario di intervento per la riqualificazione urbana e la sicurezza delle periferie delle Città metropolitane e dei comuni capoluogo di provincial* or *Bando Periferie*) [1].

On the contrary, the proposal presented by the metropolitan city of Bologna is unrelated to any previous plan or programme; it is a pilot urban regeneration intervention in an urban context characterized by social fragilities.

Among the medium-sized cities that submitted proposals in continuity with the financed projects of the National Urban regeneration Call, there is the municipality of Parma which promoted a punctual intervention, though part of a wider redevelopment process in the peripheries, started in 2016, and the municipality of Reggio Emilia which promoted the *Reggiane/Santa Croce* Urban Redevelopment Programme.

The Municipality of Modena then proposed an urban and architectural redevelopment project resulting from a national call for ideas in 2008. The Municipality of Ferrara had already launched an urban regeneration strategy in 2009, the "Special Area Programme: Actions for the urban development of the areas of excellence in the city of Ferrara". Specifically, the proposed intervention is located in an area in continuity with the project presented for the 2016 Programme, which envisaged the redevelopment of the Darsena area.

The project area in Ravenna is the ex Dante Alighieri barracks in the city centre, chosen as the object of intervention as a disused area. The city of Ravenna in the 2016 Programme presented the redevelopment of the dock.

The strategy proposed by the Municipality of Forlì follows urban regeneration projects carried out in the past years focused on the historic centre and the first urban expansion.

The Municipality of Cesena presented the project submitted to the 2016 Programme to complete the regeneration of the area. The strategy also involves the city's main public spaces located in the historic centre.

The Rimini Sea Park aims to achieve the objectives of the 2010 Strategic Plan for Rimini and its territory. The one presented in the analysed call is the southern portion of the Park, Miramare area. The northern portion was presented in the 2016 National Programme.

3. A comparative analysis of the financed projects and related mobility interventions

This study considers mainly the Regional Call projects submitted by medium-sized cities in Emilia-Romagna, coinciding mainly with provincial capital cities, aside from Cesena. Besides these, the study also considers the municipality of Bologna (not the metropolitan area), and the union of six municipalities in the Province of Piacenza. All the considered projects are mainly punctual, aside from Piacenza's case.

The methodology adopted for the comparative analysis considers a series of five parameters, as shown in Tab.2: the financial contributions, the location of the intervention area, with respect to the city centre, the proximity to mobility services and finally the intervention typology, with a specific focus on open space interventions.

[1] The Programme and the related call for proposals were set up by the Italian Stability Law in 2016 with an initial budget of 500 million euros. The Call for Proposals (DPCM 25 May 2016) defined the projects submission procedures and set the funding maximum amount for each type of city, according to size: 18 million euros for municipalities and 40 million euros for metropolitan cities. A total of 120 proposals were submitted, by 13 metropolitan cities and 107 provincial capital cities.

In the end the study collects the most important indicators, set by each city to monitor the strategies over time, and tries to combine them in clusters.

Financial contributions	**Type of regional funds**
Location	Location of the intervention area with respect to the city centre: A) in the city centre, B) near the city centre; C) in the suburbs
Proximity to mobility services	Connection between the project area and the main mobility infrastructures, including soft mobility and e-mobility facilities
Interventions on buildings	Strategies including the rehabilitation of public buildings
Interventions on open spaces (squares, roads, paths)	Specifies what interventions will be carried out in open spaces and especially on roads and mobility infrastructure

Tab.2 Parameters for the comparative analysis of the urban regeneration financed projects

Tab.3 provides a brief analysis and description of the financed projects presented by the analyzed cities within the Urban Regeneration call, by comparing the different parameters: their funding sources, their location and their proximity to mobility services. Furthermore, the table summarizes the proposed regeneration interventions concerning built-up areas and/or open spaces, especially describing interventions on slow mobility infrastructures. The proximity to the historical centre is a relevant feature of the projects, because of possible connections to central functions, and a wide range of cultural, commercial, and institutional activities. Likewise, the table also highlights the proximity to the main roads and public transport nodes, considering also smart mobility services, such as bike sharing.

CITY	**FUNDINGS**	**PROJECT LOCATION**	**PROXIMITY TO MOBILITY SERVICES**	**INTERVEN -TIONS ON BUILDING S**	**INTERVENTIONS ON OPEN SPACES (SQUARES, ROADS, PATHS)**
BOLOGNA	CDP fund 2,499,999.30 €	Proximity to the city center 	- public transport stops to the West and the East; - primary communication roads; - cycle path to the North and West; - pedestrian inner area; - 30 km/h zone.	⊘	∨	- make paths clear and recognizable; - redevelopment of existent inner paths; - limitation of motorized vehicles; - introduction of play and sports areas.
PIACENZA (UNION OF MUNICIPA LITIES)	FSC fund 1,000,000.00 €	Provincial territory 	- proximity to the Via Emilia	⊘	∨	- improvement of the safety of the roads; - reconfigure the signage to make it clear and visible; - integration of the street furniture; - requalification of the accommodation facilities etc.
PARMA	CDP fund 2,100,000.00 €	Proximity to the city center 	- public transport stops; - cycle path to the East; - major traffic route to the South.	∨	∨	- rehabilitation of damaged footpaths; - implementation of road lighting; - measures to reduce speed in surrounding streets.

REGGIO EMILIA	FSC fund 1,500,000.00 €	Proximity to the city center 	- public transport stops; - railway station to the North; - important communication routes; - bike sharing in Piazzale Europa, to the North; - bicycle and pedestrian network along main axes.	✓	⊘	- redevelopment of the most important surrounding streets; - restoration of the bicycle-pedestrian underpasses; - reshaping the structure of Viale Ramazzini to include bicycle lanes.
MODENA	FSC fund 1,500,000.00 €	Suburbs 	- public transport stops; -important boulevard to the West; - cycle-pedestrian paths to the North and West.	✓	✓	- redevelopment of existing buildings; - implementation of pedestrian cycle routes in the South and East and conclusion of those in the North; - limitation of motorized vehicles; - integration of the vehicular traffic road in the South.
FERRARA	FSC fund 1,500,000.00 €	Proximity to the city center 	- public transport stops; - important boulevard to the North-West; - surrounding pedestrian cycle routes.	✓	⊘	- expansion of the ex Mof underground car park.
RAVENNA	FSC fund 1,500,000.00 €	City center 	- Southern pedestrian route; - North-West cycle path; - along the historical and cultural pedestrian route; - bike sharing stations within walking distance to the East and West.	✓	✓	- demolition of part of the buildings; - reconfigure the signage to make it clear and visible; - creation of a urban park with different functions and inner paths.
FORLÌ	FSC fund 1,500,000.00 €	City center/ Suburbs 	- public transport stops; - beltway to the North; - pedestrian cycle path to the North-West on the main road; - major traffic route to the West.	✓	✓	- rehabilitation of existing awnings; - creation of an urban park with different functions and a play area; - redevelopment of the existing car park; - inclusion of internal paths.
CESENA	FSC fund 1,500,000.00 €	City center 	- public transport stops to the West; - bike sharing stations in Bufalini square; - 30 km/h zone; - limited traffic zone.	⊘	✓	- creation of limited traffic areas; - pedestrianisation of the squares.
RIMINI	FSC fund 1,500,000.00 €	Waterfront 	- public transport stops; - main traffic axis.	⊘	✓	- division of the seafront street; - make it pedestrian and bicycle accessible; - set back vehicular traffic and car parks to inner roads.

Tab.3 Comparison among the allocation of the regional financial contributions and the regeneration strategies for each provincial capital city

Looking at the funding sources, only the cities of Bologna and Parma presented projects that have been included in the CDP fund, while all other cities have received funding through FSC funds, because they mainly dealt with the redevelopment of public facilities or public utility facilities.

The location of the projects varies, but most of them are in the historic center or in the immediate proximity, in degraded places, both physically and socially and often abandoned, without any historical or cultural connotation. One exception is Cesena's project, which plans to redevelop the three historical squares in front of the Biblioteca Malatestiana: the project does not include the demolition or construction of new buildings, but only the open spaces renewal and the reconfiguration of functions. Another case is Piacenza's project, which deals, as in the case of Cesena, with the increase in safety and attractiveness of an historical and cultural route. Another fundamental aspect, which has helped the orientation of each strategic choice, is the proximity not only to the historic center but also to the main mobility infrastructures and services; these include major avenues and roads, junctions such as the railway station, but also cycle paths, pedestrian routes and the technological bike sharing stations. All the areas subject to funding are located close to local public transport stops, except for the block of Ravenna, which is, anyway, not far from public transport routes. Common to the 7 cities, is the nearness to cycle and pedestrian paths that, anyway, need often to be implemented. Finally, the proximity to major traffic arteries or boulevards is common to 5 cities, making the regeneration sites more easily connected to other urban strategic areas. Another important issue is the presence of bike sharing stations, which all sustainable mobility plans intend to boost, also in line with the regional project *Mi muovo* which proposes a better intermodality; among the cities, Cesena has already set up a bike sharing station in the project site, while Reggio Emilia and Ravenna already had them in the surroundings.

As shown in Table 3, mobility, despite being part of all regeneration operations, is the main focus of 8 projects (Bologna, Piacenza, Parma, Modena, Ravenna, Forlì, Cesena and Rimini), while in the other 2 (Reggio Emilia, Ferrara) it is part of a wider regeneration strategy, involving a larger urban sector in which the financed project is located. The redevelopment of streets and public squares, as part of regeneration projects, is always considered by the public administrations and taken as an opportunity to make these places even more accessible, to foster quality of life, increase safety for all users, exclude vehicular traffic, and promote slow mobility. Only the city of Rimini based its whole strategy on the redevelopment of the seafront road system, fully integrating the concept of mobility with that of environmental sustainability. The regeneration of existing spaces for mobility is mainly achieved by redesigning the road section to add lanes especially for cyclists, as in the city of Reggio Emilia and Rimini, rebalancing the parking spaces, enhancing the use of sustainable means, redeveloping or creating pedestrian and cycle routes, as in Bologna, Modena and Cesena.

The limitation of motorized vehicles from the regeneration project area is a prerogative of most of the analyzed projects (Bologna, Modena, Cesena, Rimini), which choose to move traffic outside the regeneration area, mainly along the perimeter, or create new flows in other directions. The considered areas remain available exclusively for pedestrians and cyclists becoming, in most cases (Bologna, Ravenna, Forlì, Cesena, Rimini), urban parks. Instead, cities like Ferrara and Ravenna, which still have city walls, aim at the environmental regeneration and upgrading of the green areas surrounding the ancient perimeter, enhancing slow mobility routes.

Technology, thanks to the recent transition towards the Smart City (Buscema, 2020; Fistola, 2013; Garau et al., 2017; Moraci & Fazia, 2013; Papa et al., 2013), is increasingly used even to deal with environmental issues and social integration. In some of the projects it is used to promote tourism, as in the case of Piacenza and Modena, which provide for the installation of interactive totems or exhibition routes that explain the urban attractions, in an intermodal way. We can consider clean mobility, not motorized, supported by real-time information and more accessible to users, as "smart" because it provides time saving, an improvement of commuting efficiency, costs saving and CO_2 emissions reduction (Niglio & Comitale, 2015).

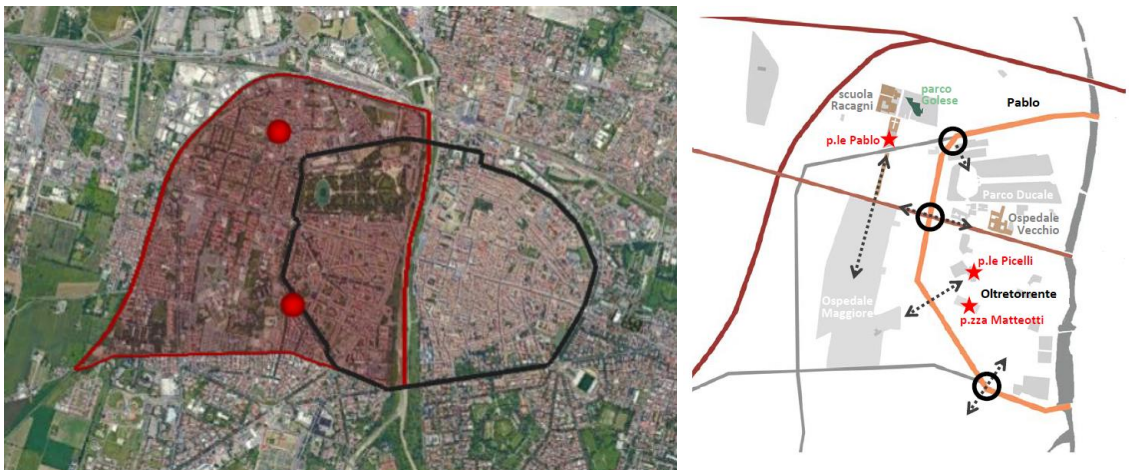
3.2 A focus on the case of Parma Municipality

As shown in table 3, the municipality of Parma has received funding of 2,100,000.00 euro through the regional call for proposals, and its regeneration strategy involves two neighbourhoods, Oltretorrente and Pablo, in the western part of the city.

Two projects have been funded, just outside the perimeter of the historical center. One focuses on the architectural and functional redevelopment of a building, aiming at the social regeneration of the area , though not including the redevelopment of the building's surrounding area. The second focuses on the construction of a new library. In any case, both contribute to the arrangement of the communication routes in the two neighborhoods of which they are part.

The most important project, for the purposes of this article, is located in the Pablo district, in the North West of the city, and concerns the construction of a new library. The project aims at the creation of a new urban centrality with a variety of services for citizens: greenery, car parks and meeting areas. It does not aim only at enhancing slow mobility, but also at a general reorganization of the mobility system in the surrounding neighborhood to make the area more easily accessible.

The project interventions point at the reconnection of the district with the city centre and with local emergencies such as the Ducal Park and the Hospital, creating a new physical and visual connection with the Park and simplifying movement in the neighborhood (Fig.1). The same interventions are also included in the SUMP (Sustainable Urban Mobility Plan) of Parma and involve the increase of bike sharing stations and cycle routes.



(a) (b)

Fig.1 (a) Location of the intervention in relation to the historic city centre and (b) Main connections between the neighbourhoods

As we can see in Fig.2, the area is an important junction, both because of the main existing roads and because of the proximity of the two projects to mobility services. In addition to the numerous public transport stops connecting the centre with the southern and western part of the city, there are also eight bike sharing stations and some electric car recharging stations in the main car parks. There are three main roads with intense traffic: from North to South in the map in fig.2 we find Viale Piacenza, in the Pablo district, which runs from North East to West, Via Emilia, which crosses the city from West to East, and Viale dei Mille, which marks the boundary of the Oltretorrente neighbourhood and runs alongside the project further South.

The initiatives proposed by the regeneration strategy interact with those of the SUMP of the city, drafted in 2017, which followed the European project in which the city took part called "BUMP" (Boosting Urban Mobility Plan) in 2014.

The main problem in the area, although well served by cycle lanes as far as the main city connections are concerned, is the traffic speed in the main roads. A proposal to mitigate this problem is the introduction of a 30 km/h zone in the Pablo district, the extension of the cycle network and the improvement of the footpaths conditions.

The regeneration strategy of the municipality of Parma is also important from the point of view of safety, not only on the road but also social security, thanks to improved lighting in the inner streets, which are perceived as unsafe and therefore not much frequented at certain times of the day.

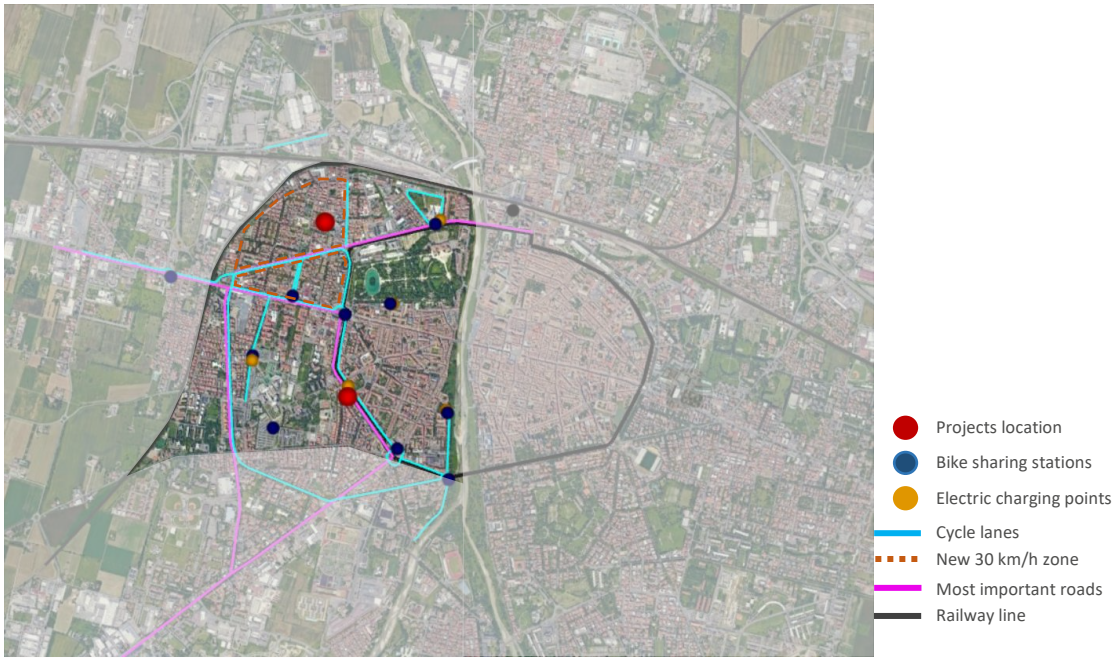


Fig.2. Location of the most important mobility services in the two studied neighborhoods

4. Discussion

The implementation of the projects financed in 2018 have already started, and it will continue in the next few years. In the meantime, the Municipalities have drawn up sets of indicators to monitor the implementation of the regeneration strategy. These indicators are mainly quantitative and aim at assessing the overall and continuous urban improvement of the regeneration areas. Table 4 summarizes the main indicators adopted by the cities.

They have been divided into categories, identifying those referring to pedestrian or cycling mobility, to the accessibility of the areas, to the urban quality of the public space, usually including the redevelopment of green areas, to road safety and attractiveness. Most of the adopted indicator refers to the number of inhabitants and users involved by the project; other indicators consider the total surface of the regenerated areas, the number of new cycle or pedestrian accesses, the lengths of new cycle paths. Only the cities of Cesena, Ravenna and Ferrara have set up no monitoring indicators for their strategies.

However, also looking at the indicators, it emerges clearly that these urban regeneration interventions, are often included in a wider planning perspective, which generally relates to the SUMPs strategies. Indeed, besides indicators that refer directly to mobility monitoring (length of cycle paths, pedestrian accessible areas, new bike sharing stations etc.), there are also indicators to assess urban quality, e.g., the number of users of the new infrastructure, the number of collective initiatives.

It is also interesting to highlight that all the analysed projects pay attention to the safety issue for all road users (pedestrians, cyclists and vulnerable users such as children and older people), proposing specific interventions also in the surroundings of the regeneration areas. The Region already gave strong impulses to

the development of sustainable mobility projects such as "Bicibus" and "Pedibus", which involve children and young people, and to redevelopment projects aimed at removing architectural barriers.

INDICATORS		CITIES INVOLVED
PEDESTRIAN MOBILITY	Surface of pedestrian paths	Bologna, Rimini
	Users of the pedestrian paths	Rimini
	Pedestrian accesses	Forlì
CYCLING	Surface of cycling paths	Bologna, Rimini
	Linear meters of cycle lanes	Forlì
	Nr. of bike sharing stations	Forlì
	Users of bike sharing service	Forlì
	Users of the cycle paths	Piacenza, Rimini
ACCESSIBILITY	Surface for vehicular traffic only	Rimini
	Surface for car parking along the streets	Rimini
	Nr. of free visuals	Bologna
	Nr. of bicycle accesses	Bologna, Forlì
	Pedestrian accesses	Forlì
	% of accesses without architectural barriers	Bologna
	Presence of solutions for the recognition of spaces/paths	Bologna
	Clear signage and charts, maps for blind people	Bologna
	Reduction of travel time in critical areas created by rationalising of viability	Reggio Emilia
	Public transport users to access the area	Forlì
URBAN QUALITY	Green surface	Rimini, Forlì
	Nr. of seats	Bologna
	Equipment and support elements accessible to people with disabilities	Bologna
	Nr. of water fountains	Bologna
	Surface of regenerated areas in environmental and microclimatic terms	Reggio Emilia, Rimini
	Nr. of new trees	Reggio Emilia
	Surface of de-sealing areas	Reggio Emilia
	Redevelopment of public areas with works of art, street art	Forlì
ROAD SAFETY	Nr. of road accidents involving cyclists and pedestrians	Parma
	Nr. of efficient poles replaced/installed	Parma
	Suitable street lighting	Bologna, Parma
ATTRACTIVENESS	Nr. of new residents and/or tourists using the new physical connections	Piacenza, Reggio Emilia, Parma, Modena, Forlì
	Nr. of new collective initiatives	Piacenza, Modena
	Users of bike sharing service	Forlì
	Public transport users that access the area	Forlì

Tab.4 List of the most frequent indicators applied by the analysed cities to monitor the impacts of the regeneration strategy

The main interventions, planned by SUMPs, provide the extension of the Traffic Limited Zone zones (as in Ravenna) to the whole city center or, if possible, the diversion of vehicular traffic outside the centre (Rimini). In the case of Cesena the aim is to connect strategic points through pedestrian routes.

One of the main actions is to compartmentalize different zones, pedestrianize squares (Cesena), defining a road hierarchy (Bologna, Rimini), using underground or interchange car parking at the edges of urban areas

(Ferrara) and creating separate lanes in the roadway. This also helps tourists giving them a clearer and safer vision of the places to visit, as happens in Rimini and Ravenna. An exception is the city of Piacenza, which deals with the regeneration issue on a larger scale, with a project aimed at serving the pilgrims paths, and accompanying them during their journey.

Social security is another point of interest, as in Parma, where the project operates on public lighting to make inner streets more secure and available for everyone.

In general, all the financed regeneration strategies paid a lot of attention, aside from accessibility and social inclusion, also to the environmental sustainability, which represents another fundamental pillar in all the analyzed interventions. Environmental aspects, aimed at improving the microclimate, reducing the heat island effect, and promoting adaptation to climate change. This is developed both in the buildings architectural designs, with the use of special roofing materials and green roofs (Parma), and in open spaces, including those dedicated to mobility, providing permeable paving materials (Bologna, Reggio Emilia, Cesena, Rimini), new green areas (Parma, Ferrara, Rimini), an efficient rainwater management (Bologna) and the installation of water surfaces to maintain lower temperatures in summer (Cesena).

Furthermore, there are some external projects in relation to the regional call, which municipal administrations are carrying out, such as Smart City projects or projects linked to European initiatives dealing with environmental and energy saving issues, and which have an impact on the municipal mobility planning.

The Region aims at reducing polluting emissions with the "Integrated Regional Air Plan" developed in 2014 and the "Po Regions Engaged to Policies of Air Project" in 2016. With regard to sustainable mobility, and intermodality, the Region promoted the "I move" (*Mi muovo*) project for the improvement of local and regional public transport.

Each city has also joined projects mainly focused on sustainability and adaptation to climate change, like the city of Bologna and Ferrara. Seven of these cities also joined projects on sustainable mobility, both European and national initiatives, with the aim of promoting slow mobility, sustainable mobility, intermobility, e.g. a project for sustainable home-school and home-work mobility, using bycicles (Forlì, Cesena) and developing the SUMPs.

As mentioned, the strategies described were proposed in September 2018 and have already started the approval process towards final projects and their implementation. From the Regional Report released in March 2020 we can see how the majority of the 43 projects have already reached the definition of the final project. In the case of the provincial capitals analysed, only Bologna and Reggio Emilia are at the first step. The others have defined their final projects, obtained the approval of the Regional Council and have reached the signing stage. The next step is therefore to start the tendering procedure.

5. Concluding remarks

The "Agenda 2030 for Sustainable Development" signed by the UN in 2015, with goal 11 aims to "make human settlements inclusive, safe, durable and sustainable" and outlines a number of actions to achieve the goal, including the strengthening of local public transport and a focus on vulnerable road users.

A combined strategy of urban regeneration and redevelopment of public spaces for mobility and services, such as those we have seen above, can contribute to achieving this goal.

Diffuse pollution, climate change and energy resources' crisis require cities of the future to increase their energy efficiency as a whole, improving performance and reducing consumption, primarily energy. Undoubtedly, the choices and behaviors in the field of mobility, transport modes and their characteristics, as well as, more generally, the way in which travel decision are made have a high impact on the carbon footprint of cities (Niglio & Comitale, 2015).

The contribution analyzed how the development of sustainable mobility, a theme strongly supported at European level but also in local policies, has been transferred into urban regeneration projects within the

Emilia-Romagna Region. The presented projects show how much urban regeneration and mobility issues are closely intertwined: urban mobility, safety and environmental sustainability represent pillars of all the analyzed regeneration strategies.

The strategies are examples of how urban regeneration, which is not only architectural but also social and cultural, can be used to redesign public spaces for collective life and mobility, thus becoming an opportunity for a widespread regeneration of the urban mobility network. And the outcomes show how much soft mobility plays a crucial role within urban regeneration policies. Promoting walkability, as emerged from the comparative analysis, is one of the best tools in the hands of public administration to develop sustainable mobility policies that are both people oriented and climate friendly.

And that nowadays, those approaches may be pursued mainly through urban regeneration interventions: urban regeneration today can, and must, be the opportunity to rethink soft mobility in our cities with a view to promoting a widespread accessibility. Walking, or cycling, should become an 'attractive' alternative to motorised transport over short distances and a mode of transport integrated with an efficient public transport system. The decision of removing vehicular traffic, where possible, can greatly improve also safety issues, making the street a safer place for pedestrians and cyclists.

In this vision, Sustainable Urban Mobility Plans (SUMPs) can be considered as a tool able to integrate the long-term goals for transport users at all mobility levels by proposing planning practices with a human-centered approach, to be pursued by regeneration strategies, considering their needs and highlighting the importance of citizens' quality of life.

Further developments of the presented work may involve the follow-up of the analysed regeneration projects, and the assessment of the proposed indicators to monitor the strategies and provide a comparison among the different initiatives.

Considering the complexity of a constant monitoring of the progress of projects, we can deduce that relying only on information found on municipal websites would be insufficient. The participation in the initiatives of numerous stakeholders, associations and private individuals, who often also finance part of the costs together with the municipality, influences on the one hand the actual progress of the realisations, and on the other hand the updates that may be of interest to the citizenship.

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Image Sources

Fig.1a: re-elaborated version from Google Earth;

Fig.1b: technical report, web site Emilia-Romagna Region;

Fig.2: re-eleaborated version from Google Earth.

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