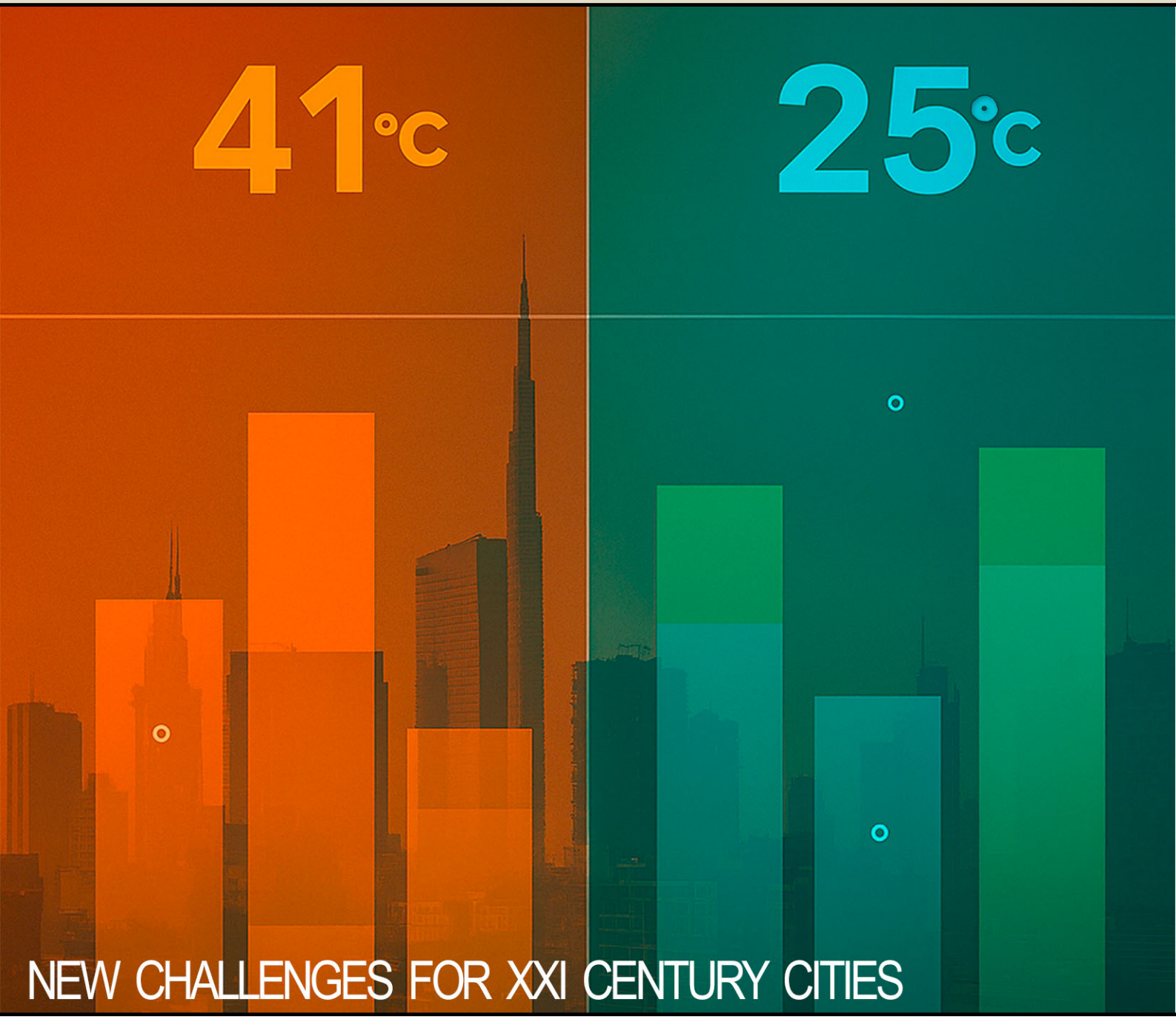
TeMA

18th TeMA Journal
Congratulation on officially becoming an adult
Enjoy your freedom

Journal of
Land Use, Mobility and Environment

print ISSN 1970-9889 e-ISSN 1970-9870
FedOA press - University of Naples Federico II

DOAJ anvur Rivista scientifica di classe A - 08/F1 Scopus WEB OF SCIENCE



NEW CHALLENGES FOR XXI CENTURY CITIES

Multilevel scientific approach to impacts of global warming on urban areas, energy transition, optimisation of land use and emergency scenario

Vol.18 n.3
Dicember 2025

TeMA Journal was established with the primary objective of fostering and strengthening the integration between urban transformation studies and those focused on mobility governance, in all their aspects, with a view to environmental sustainability. The three issues of the 2025 volume of TeMA Journal propose articles that deal with the effects of Global warming, reduction of energy consumption, immigration flows, optimization of land use, analysis and evaluation of civil protection plans in areas especially vulnerable to natural disasters and multilevel governance approach to adaptation.

TeMA is the Journal of Land Use, Mobility and Environment and offers papers with a unified approach to planning, mobility and environmental sustainability. With ANVUR resolution of April 2020, TeMA journal and the articles published from 2016 are included in the A category of scientific journals. The articles are included in main scientific database as Scopus (from 2023), Web of Science (from 2015) and the Directory of Open Access Journals (DOAJ). It is included in Sparc Europe Seal of Open Access Journals, and the Directory of Open Access Journals.

TeMA Journal of
Land Use, Mobility and Environment

NEW CHALLENGES FOR XXI CENTURY CITIES:
Multilevel scientific approach to impacts of global warming on urban areas, energy transition, optimisation of land use and emergency scenario

3 (2025)

Published by
Laboratory of Land Use, Mobility and Environment
DICEA - Department of Civil, Building and Environmental Engineering
University of Naples Federico II, Italy

TeMA is realized by CAB - Center for Libraries at University of Naples Federico II using Open Journal System

Editor-in-Chief: Rocco Papa
print ISSN 1970-9889 | online ISSN 1970-9870
Licence: Cancelleria del Tribunale di Napoli, n°6 of 29/01/2008

Editorial correspondence
Laboratory of Land Use, Mobility and Environment
DICEA - Department of Civil, Building and Environmental Engineering
University of Naples Federico II
Piazzale Tecchio, 80
80125 Naples (Italy)

https://serena.sharepress.it/index.php/tema
e-mail: redazione.tema@unina.it

The cover image was created using an AI tool, taking into account the thematic content of the articles included in this issue.

TeMA - Journal of Land Use, Mobility and Environment offers researches, applications and contributions with a unified approach to planning and mobility and publishes original inter-disciplinary papers on the interaction of transport, land use and environment. Domains include: engineering, planning, modeling, behavior, economics, geography, regional science, sociology, architecture and design, network science and complex systems.
With ANVUR resolution of April 2020, TeMA Journal and the articles published from 2016 are included in A category of scientific journals. The articles published on TeMA are included in main international scientific database as Scopus (from 2023), Web of Science (from 2015) and the *Directory of Open Access Journals* (DOAJ). TeMA Journal has also received the *Sparc Europe Seal* for Open Access Journals released by *Scholarly Publishing and Academic Resources Coalition* (SPARC Europe). TeMA is published under a Creative Commons Attribution 4.0 License and is blind peer reviewed at least by two referees selected among high-profile scientists. TeMA has been published since 2007 and is indexed in the main bibliographical databases and it is present in the catalogues of hundreds of academic and research libraries worldwide.

TeMA Journal of Land Use, Mobility and Environment

NEW CHALLENGES FOR XXI CENTURY CITIES:
Multilevel scientific approach to impacts of global warming on urban areas, energy transition, optimisation of land use and emergency scenario

3 (2025)

Contents

REVIEW NOTES

TeMA Journal of Land Use, Mobility and Environment

TeMA 3 (2025) 419-435
print ISSN 1970-9889, e-ISSN 1970-9870
DOI: 10.6093/1970-9870/11565
Received 10th January 2025, Accepted 6th September 2025, Available online 31st December 2025

The Axis Contract for the regeneration of fragile territories. An experiment along the Civitavecchia Capranica Orte railway line

Chiara Amato [a]*, Mario Cerasoli [b]

[a] INU Lazio (National Institute of Urban Planning)
Rome, Italy
e-mail: chi.amato90@gmail.com
ORCID: http://orcid.org/0000-0002-7089-5538
* Corresponding author

[b] Department of Planning, Design, Technology of Architecture
Sapienza University of Rome, Rome, Italy
e-mail: mario.cerasoli@uniroma1.it
ORCID: https://orcid.org/0000-0001-5891-4049

Abstract
The article explores the revitalization of Italy's "inner areas" - fragile territories facing challenges such as depopulation, abandonment, and a lack of essential services, primarily due to limited mobility. The enhancement of secondary and disused railways is proposed as a tool for territorial rebalancing, to be achieved through multilevel governance that integrates spatial planning, interinstitutional cooperation, and the strategic allocation of financial and economic resources. This approach aims to move beyond sectoral perspectives on infrastructure networks.
The *Axis Contract* is introduced as an integrated framework linking urban planning and mobility, centered on the right to mobility and the empowerment of local communities.
The article is structured into three parts: the first examines the relationship between territory, mobility, and infrastructure policies; the second analyzes the French *Contrat d'axe* model and its applicability in Italy; and the third presents the results of an interdisciplinary study on the reactivation of the Civitavecchia - Capranica - Orte railway line.
The findings confirm that the *Axis Contract* is an effective tool for integrating urban and mobility planning, addressing accessibility needs, and promoting the sustainable rebalancing of territories.

Keywords
Sustainable mobility; Urban planning; Inner Areas

How to cite item in APA format
Amato, C. & Cerasoli, M. (2025). The Axis Contract for the regeneration of fragile territories. An experiment along the Civitavecchia Capranica Orte railway line. *TeMA - Journal of Land Use, Mobility and Environment*, *18* (3), 419-435. http://dx.doi.org/10.6093/1970-9870/11565

1. Introduction[1]

This article examines the reactivation of Italy's "internal areas," fragile territories affected by depopulation and abandonment due to socioeconomic challenges, including insufficient essential services and mobility barriers that undermine the "Right to Mobility" (Amato, 2021).

In this context, a strategy focused on secondary railway lines—many facing decommissioning—can support territorial rebalancing policies. This requires a multilevel governance framework that integrates territorial and urban planning with interinstitutional cooperation, leveraging financial resources and voluntary coordination tools.

International debates highlight the need to move beyond a sectoral approach to infrastructure, advocating for strategic urban, territorial, and mobility planning that aligns with evolving economic, settlement, and governance dynamics.

This article focuses on the Axis Contract, an integrated urban/mobility planning tool tested in the reactivation of the Civitavecchia-Capranica-Orte railway. The study is structured in three parts: the first explores the relationship between territory, mobility, and infrastructure policies; the second analyzes the French "Contrat d'axe" as a reference for adapting the Axis Contract to Italy; the third presents findings from interdisciplinary research conducted since 2021 at Roma Tre and Sapienza Universities.

Results confirm that the Axis Contract serves as a platform for integrating urban and mobility planning, providing concrete, shared responses to the Right to Mobility and fostering sustainable territorial balance.

2. Secondary railways and fragile territories

2.1 Settlement phenomena, mobility models and territory

There is a strong connection between infrastructure, mobility, and territory, recognized since the 1980s through national research[2]. Today, more than ever, an integrated approach is essential to rebalance the territory and achieve the green, ecological, and inclusive transition central to EU policies in the post-COVID era. Accessibility is a key issue in this context.

In Italy, 48.5% of the 7,901 municipalities, covering 59% of the national territory, are significantly distant from essential services (education, health, and mobility) (Barca et al., 2014). Since 2014, these have been classified as "inner areas" by the National Strategy for Internal Areas (SNAI)[3]. These areas have long suffered from depopulation, which between 2014 and 2024 reached -5.0% (compared to -2.2% nationally)[4]. This decline has impacted secondary railways, which serve as the backbone of these areas but have lost passengers over time, fueling a vicious cycle exacerbated by evolving settlement patterns since the post-war period.

After World War II, Italy's infrastructure reconstruction, particularly railways, required massive investment. This period, driven by the Marshall Plan, coincided with the global spread of new mobility models centered

---

1 This contribution is part of ongoing research exploring the relationship between infrastructure and territory. Key projects include:
- "Railway policies, Territory and Mobility," coordinated by the author, involving the University of Roma Tre, CONICET (Buenos Aires), and UBA (Jorge Blanco), with results published in 2012 and 2015.
- "Paths of resilience: Reuse and relaunch of minor railways for fragile territory regeneration," led by Chiara Ravagnan and funded by Sapienza in 2018, involving several universities, with results published in 2020.
- "Right to mobility and contemporary city: The role of rail infrastructures in territorial regeneration strategies," coordinated by the author and funded by Sapienza in 2019, with results published in 2021.
- "Mobility infrastructures: New paradigms for European cities' resilience," coordinated by Bruno Monardo, involving multiple universities and published in 2024.

2 Among these, the multi-year research program "ITATEN Investigation of the transformations of the national territorial assets", conducted by A. Clementi, G. Dematteis and P. Palermo and the research program "RETURB Large networks and urban transformations in Italy", coordinated by A. Clementi, both in the Nineties.

3 The definition of "inner area" is linked to the levels of accessibility, calculated on the basis of travel times from the centroid of a municipality to reach, by car, the municipalities that are service provision centres (the "poles").

4 Data ISTAT National Institute of Statistics 2022-24; Department for Cohesion Policies and the South, 2024.

around automobiles. Enrico Menduni identifies three key events between the mid-1950s and mid-1960s that sparked a transformation in mobility and living patterns: the launch of RAI's television broadcasts in 1954, the debut of the FIAT 600 in 1955, and the construction of the Autostrada del Sole in 1956. Television played both a cultural and commercial role, spreading the American model and boosting consumerism, while highways facilitated the shift from rail to road travel.

These changes led to urban sprawl and suburbanization, with cities expanding to accommodate internal migration, while small towns, particularly in the Apennines and the South, were increasingly abandoned. The 1950 Agrarian Reform failed to resolve agricultural inefficiencies, further accelerating depopulation (Fabbri, 1983). The decline of railways, especially secondary lines, was exacerbated by national policies that reduced investments, leading to declining accessibility, service reductions, and increased vulnerability to natural risks due to the loss of local stewardship.

To counteract these trends, the Department for Development and Cohesion Policies (DPS) was established in 1998, later renamed the Department for Development and Economic Cohesion in 2006. However, it was not until 2013, under the Monti government and Minister Fabrizio Barca, that the Agency for Territorial Cohesion[5] was created, launching SNAI. Inner areas are primarily served by secondary railways, representing 56% of Italy's railway network. Unlike main lines, which are crucial for high-demand travel, these lines ensure territorial connectivity for scattered populations. However, they suffer from technological gaps, with 54% being single-track and 30% non-electrified[6].

Fig.1 Civitavecchia - Capranica - Orte railway line

Affected more by unsustainable policies and mass motorization than actual obsolescence, secondary railways have faced continuous cuts since the 1950s. Between 1950 and 1999, 4,028 km of secondary railways were

[5] The Agency for Territorial Cohesion is abolished in 2023 and replaced by the Department for Cohesion Policies and for the South, Ministry for European Affairs, the PNRR and Cohesion Policies.

[6] Source: RFI Italian Railway Network, 2024.

decommissioned[7], leading to the closure of over 1,100 stations. Since 2000, an additional 1,694 km have been closed or had service suspended, totaling a loss of over 5,700 km - nearly 24% of the 1936 railway network (Sellari, 2011). This has severely impacted inner areas, increasing their fragility.

The transformation in mobility is evident in transport usage data. Since 1971, pedestrian mobility has plummeted, private car use has nearly tripled, and public transport usage has halved[8]. These trends reflect a shift towards dispersed living near large cities and the abandonment of historic centers in small municipalities (Estanqueiro & Cerasoli, 2018). The appeal of automobiles, coupled with deteriorating public transport, has both shaped and responded to these changes.

Since the 1990s, the EU has sought to address the rail crisis and territorial imbalances. Directive 91/440/EEC (1991) aimed to open national rail networks to international services in an integrated, competitive infrastructure system. However, its economic focus overlooked the territorial impacts of market liberalization and the varying interpretations in national legislation. Many EU countries prioritized profitable main lines, particularly high-speed rail, benefiting only a small portion of the population. This has deepened disparities between "fast" and "slow" territories, contributing to an unplanned redistribution of populations and economic activities in a context of pseudo-liberalization (Cerasoli, 2012; Cerasoli, 2020).

2.2 Right to mobility for inner areas. Towards an integrated approach

Today, Italy's abandoned railway heritage comprises over 8,000 km of disused or underused lines (Marcarini, Rovelli, 2018). Like uprooted roots, their cessation has stripped territories of economic and social vitality. These broken links in the secondary railway network must be repurposed to support sustainable mobility, integrating innovative transport solutions tailored for inner areas - such as mobility sharing, on-demand services, and intermodal hubs - redefining catchment areas and enabling the sustainable reactivation of basic services.

Both "top-down" European and national policies (2007-2013, 2014-2020) and National Recovery and Resilience Plan (PNRR)[9] investments, along with "bottom-up" community mobilization, highlight the potential of repurposing this heritage. Citizens, associations, and local administrations demand strategic reuse solutions that address community needs, particularly in marginal and internal areas where rail services have been withdrawn.

As highlighted in recent studies (Ravagnan & Amato, 2020), interventions in fragile, low-density areas should be guided by three key principles: promoting intermodality and multiscalarity to connect peripheral areas with larger infrastructure networks; integrating digital, cultural, and social dimensions to foster innovation and heritage valorization; and enhancing ecosystem services to support ecological regeneration and risk mitigation.

In Italy, processes of integrated redevelopment have been implemented in recent years, aligning with current trends in integrated planning that promote cycle tourism and the creation of slow mobility routes as drivers for the valorisation of inner areas (Pinto, Fossati, 2020). A particularly significant example is the *Via Verde Costa dei Trabocchi* (Fig.2), which runs from the station of Ortona to Vasto Marina. This project has enhanced the accessibility of a highly valuable coastal area, generating positive effects on land protection, the promotion of sustainable local economies, and the reduction of mobility-related air pollution. Another relevant example is the Caltagirone-S. Michele di Ganzaria Linear Park, developed by NOWA Studio along the disused Dittaino-Caltagirone railway line. The project includes the creation of a greenway and the establishment of cultural and recreational activities along its route.

---

7 These are both standard gauge and narrow-gauge lines, managed by Ferrovie dello Stato, by the Regions or Autonomous Provinces or by concessionary companies.

8 Source: ISTAT & ISFORT Higher Institute of Training and Research for Transport, 2021.

9 Mission 3 "Infrastructure for Sustainable Mobility" 25.4 billion euros for interventions to improve the railway network, especially secondary; Mission 5 "Inclusion and Cohesion" 19.86 billion - to which are added the funding of the Complementary Fund. Source: Chamber of Deputies, Parliamentary documentation (www.temi.camera.it), 2024.

Additional cases concern underutilized railway lines situated in areas of notable cultural and environmental interest, where services have been reactivated - often with a tourism-oriented approach - within the legal framework established by Law No. 128 of 9 August 2017. A noteworthy example is the *Avellino - Rocchetta Sant'Antonio* line, where the *Irpinia Express* initiative seeks to valorize the region's historical and environmental heritage. This intervention contributes to a renewed narrative and accessibility for territories historically affected by economic and demographic decline [10].

Fig.2 Via Verde Costa dei Trabocchi

This and others European experiences demonstrate that mobility infrastructure transformations should align with broader urban and territorial regeneration strategies, integrating morphological, functional, and environmental reconfigurations with socio-economic planning. These approaches reinforce the concept of the Right to the City (Harvey, 2012), extending to the Right to Mobility - encompassing accessibility, spatial justice, fair tariffs, sustainability, and liveability (Amato, 2021).

Since the 1980s, mobility has been recognized as a social issue crucial to individual and collective opportunities (Panato, 2013; Pucci, 2014; Pucci & Vecchio, 2018). The Right to Mobility entails both the freedom of movement and the ability to make informed choices about mobility options, considering accessibility, quality, costs, and social equity (Kaufmann et al., 2004; Colleoni, 2019). It also highlights urban planning's role in addressing emerging social needs through an integrated approach, overcoming sectoral divisions in mobility and urban planning. This strategy fosters inclusive and sustainable cities and revitalizes small centers, making them welcoming for people, attractive for innovation, supportive of businesses, and resilient community hubs.

3. From the contrat d'axe to the axis contract. A *transit oriented* regeneration for the right to mobility

3.1 The French *contrat d'axe* for a strategic densification

In line with what has been expressed so far, it is essential to identify shared and participatory tools that can support complex projects capable of rebalancing the territory, starting from a public transport infrastructure, capable to revitalize abandoned context (Dody et al., 2025). This involves systematizing the various competent and interested actors and offering clear rules, costs, and timelines related to field transformations.

[10] These and other case studies have been analysed within the framework of the international research project Resilience paths. The reuse and relaunch of minor railways for the regeneration of fragile territories. Experiences in Italy and Spain, founded by Sapienza University (Ravagnan & Amato, 2020).

In this sense, the French *Contrat d'axe* represents a strategic tool for pursuing the integration of infrastructural development and urban planning, guaranteeing the Right to Mobility for all territories (Ravagnan, Amato, 2019; Amato, 2021; Amato, 2022).

The *Contrat d'axe* is a negotiated planning tool aimed at integrating urban and transport development. It reconciles urban densification interventions and directs mobility demand toward alternatives to the private car. This is done by intervening on the urban form as a key factor in the use of different travel modes, thus encouraging behavioral changes in terms of private mobility.

This tool was developed in the early 2000s during the revision of the *Plan de Déplacements Urbains* (PDU) of the Metropolitan Area of Toulouse. Its goal was to control urban growth and ensure coherence between urban planning and transport organization (Bentayou et al., 2015).

A similar approach was undertaken in Grenoble, by the Mixed Public Transport Union (SMTC[11]) with the support of the Urban Planning Agency of the Metropolitan Area, where the *Contrat d'axe* was signed in June 2011, linked to the construction of the fifth tram line (Fig.3). By 2014, this tool had led to the construction of approximately 1,500 housing units along the tram line and revisions to the *Plan Local d'Urbanisme* (PLU) to incorporate "urban densification" principles.

By 2013, five *Contrats d'axe* had been signed in Toulouse, and a total of about twelve had been completed across France by 2014.

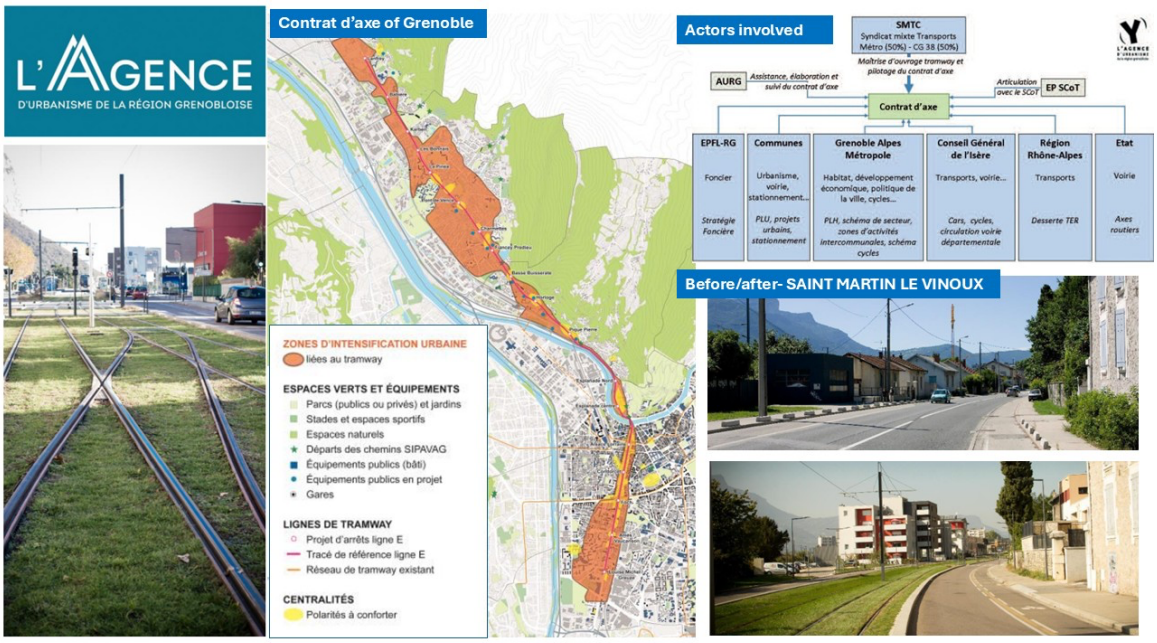


Fig.3 *Contract d'axe* for the "E" tram line in Grenoble

The Contrat d'axe currently being developed in France represents a unique experience in terms of the integration between urban development - still closely linked to a logic of controlled "expansion" - and mobility and infrastructure planning, in terms of skills, responsibilities, and programming. This result is achieved by bringing together the various institutional actors involved in urban transformation and coordinating their efforts and objectives toward a common and clear goal: to encourage as many people as possible to use the public transport infrastructure specified in the contract.

The Contrat tool also aims to enhance the effectiveness of public policies by transcending the sectorization of urban planning documents (PLU, PDU, etc.), ensuring coherence in strategic and sectoral choices.

In France, the implementation of *Contrat d'axe* follows five key phases:

[11] Today is SMMAG Syndicat Mixte des Mobilités de l'Aire Grenobloise, Mixed Union of Mobility of the Grenoble Area.

- A territorial diagnosis to identify urban development forecasts and evaluate the effects on public transport and mobility habits;
- Calibration of transport demand development scenarios based on expected demographic and urban growth, assessing socio-economic feasibility and costs/benefits of public transport;
- Formalization of the Contract, with explicit commitments from all parties involved;
- Integration of development forecasts into the urban and strategic planning tools of the municipalities;
- Monitoring of the contract's progress to ensure commitments are met on time and with expected results.

The *Contrat d'axe* is embedded within the *SCoT* (Schéma de cohérence territoriale), a strategic urban planning document that ensures coherence across multiple municipalities, particularly in terms of residential development, mobility, and environmental planning.

Specifically, some differences can be found in the use of *Contrat d'axe* in the French cases analysed, in relation to the contexts in which they were drafted. In urban and peri-urban areas, it focuses on controlling urbanization and regulating movements, as seen in Toulouse and other cities. In more intermediate areas, such as Béarn, the emphasis shifts to landscape protection and the "désenclavement" (opening up) of territories. In some cases, such as the Béarn region, the *Contrat d'axe* is also used in cross-border projects, like the reactivation of the Pau-Canfranc-Zaragoza railway line, fostering collaboration between regional actors and beyond (Region Aquitaine, 2013; Amato, 2019).

3.2 The proposal of an Axis Contract for an integrated approach

The strategic role of the *Contrat d'Axe* tool in linking urban development and mobility, as well as its potential for strategic inter-municipal coordination and community participation, presents opportunities for integration within the Italian urban planning landscape.

Much like "River Contracts"[12] for environmental planning along river sections or "Landscape Contracts"[13] for territorial landscape enhancement, the Axis Contract can be introduced as a negotiated planning tool. Its purpose is to coordinate actions aimed at urban regeneration and sustainable mobility development along an infrastructural axis, involving multiple stakeholders and leading to a shared strategic commitment.

A key aspect of the proposed Italian Axis Contract is its focus on the coherence and coordination between urban and mobility planning, within procedures that benefit both transport services along the axis and the territories they traverse. The goal is to define areas for Axis Contracts within Territorial Coordination Plans (PTC) [14], focusing on main public transport routes that require creation, enhancement, or strengthening. Each area will be evaluated for objectives, strategies, and actions, establishing the foundation for a participatory process leading to the Axis Contract.

The "axes to be implemented" refer to projects that are at various planning stages, with the goal of connecting them to territorial structures - both for sustainable mobility and green infrastructure - ensuring consistency in the development choices along these areas. These projects will be implemented through sustainable planning, assessing socio-economic and environmental impacts, and ensuring the infrastructure contributes to community cohesion and ecosystem integration.

The "axes to be strengthened" are those whose services have been reduced or suspended due to mobility dynamics, where strengthening or reactivating the service is strategic. Economic sustainability will require increased building density and a mix of uses, alongside major urban service projects that will generate

12 Article 68-bis "River Contracts" of Legislative Decree 3 April 2006, n. 152 "Environmental regulations".

13 European Landscape Convention. Pilot case "Landscape Contract in the mountain territories of Foligno, Trevi and Sellano", Umbria Region, Regional Council Resolution no. 1005 of 07.30.2012.

14 The Territorial Coordination Plan PTC is an urban planning tool at a supra-municipal scale provided for by the National Urban Planning Law n. 1150 of 1942 and still in force, even if at a regional level it may have a different name.

significant traffic along these axes. This will be coordinated with sustainable mobility alternatives, such as interurban buses or consortium shuttles, to serve a broader catchment area.

The "axes to be valorized" include operational infrastructures that can drive territorial regeneration, through rethinking network nodes in cultural-identity terms and integrating them with sustainable mobility systems, including pedestrian and cycle paths linked to parks and green areas. These areas form the foundation for launching the Axis Contracts.

The Axis Contracts are negotiated planning tools involving multiple actors to create a shared formal commitment. The process begins with establishing an inter-institutional Working Table, which can be initiated by regional, provincial, or municipal authorities, often led by the mayor of the involved municipality. Stakeholders include local authorities, the infrastructure owner, transport service providers, mobility services, area property owners, and private entities interested in the project's development.

The Working Table follows phases similar to those of a River Contract, including:

- Drafting a shared Intent Document;
- Conducting a cognitive analysis of the Territorial Plan, supplemented by further investigations if needed.
- Creating a Strategic Document and Action Program outlining long-term objectives, strategies, and intervention phases;
- Holding a participatory process with thematic workshops, engaging the local community to gather feedback and refine the framework of objectives and strategies;
- Revising the Strategic Document and Action Program based on community input;
- Finalizing and signing the Axis Contract, which outlines the roles, commitments, timelines, costs, benefits, risks, and sustainability of interventions;
- Publishing the Contract in the Official Journal and disseminating it via local information channels;
- Implementing a monitoring system to track progress and ensure compliance with the commitments.

The commitments outlined in the Axis Contract will then be incorporated into the local planning of the municipalities involved.

4. An Axis Contract for the Civitavecchia-Capranica-Orte railway

4.1 The railway line: between lost opportunities and future scenarios

The Axis Contract has been tested in the context of reactivating the Civitavecchia-Capranica-Orte railway (Fig.1), located in the southern Tuscia region, north of Rome. The rationale behind reactivating this railway is not sector-specific, but stems from an integrated territorial vision, closely tied to the concept of "territorial rebalancing." The region, rich in natural and cultural resources, is sparsely populated, with a catchment area of less than fifty thousand inhabitants. From a purely financial perspective, this region would not justify such an infrastructure, but the Lazio Region recognized its potential and included the project in the Regional Mobility, Transport, and Logistics Plan, approved in December 2020, proposing it for funding under the National Recovery and Resilience Plan (PNRR). However, it was excluded due to uncertainties regarding the start of works by 2026.

The construction of railways should be driven by regular planning efforts by the State and Regions, not only by emergency needs. This approach reflects the foundational logic behind the construction of the railway in the late 1920s. The Civitavecchia-Capranica-Orte railway was part of a broader territorial strategy aimed at connecting the ports of Civitavecchia (on the Tyrrhenian Sea) and Ancona (on the Adriatic), as well as serving key industrial sites such as the Ronciglione ironworks (16th century), Terni steelworks (19th century), Fabriano paper mills (18th century), and agricultural areas rich in high-quality crops like olives and hazelnuts.

The railway originated from a project dating back to 1860, under the Papal States, with the goal of connecting Civitavecchia to Orte, where it would link to existing rail lines to Rome, Ancona, and Florence. After several revisions, the final project was approved in 1922, with the line inaugurated in 1928 and fully operational by 1929. The 85.8 km line, characterized by steep gradients, a single track, and partial electrification, was built to connect industrial and agricultural zones. Despite various challenges, the line remained in operation until the 1960s when motorization and the increasing use of cars led to its gradual degradation, culminating in partial closure in 1961 due to a landslide.

Despite being decommissioned[15] in 2011 and various attempts at restoration, the project has never fully materialized. In 2017, the railway was included in the list of disused lines with cultural, landscape, and tourist value, but today it is in poor condition, with much of the track removed or abandoned. Nevertheless, the reactivation of the line has remained a goal for local citizens and administrators for thirty years. Restoration costs are estimated between 400 and 800 million euros[16], but despite Lazio Region funding, work has not yet commenced.

Reactivating the line could stimulate the local economy, which includes sectors such as agriculture (producing oil, hazelnuts, wine, potatoes, and beans) and industrial manufacturing (e.g., Socofer's factory in Gallese, exporting high-tech railway tracks worldwide). Furthermore, freight transport is evolving toward new models, such as small-scale distribution[17], which could be easily integrated into secondary lines like the Civitavecchia-Capranica-Orte. These smaller stations could serve as local distribution hubs or even host lockers for parcel collection. Although freight transport is crucial, passenger transport should remain the primary goal for reactivation. Offering a variety of services, such as regional trains, fast regional trains, and intercity options, could reduce road traffic, lower pollution, and improve accessibility for both tourists and residents.

To implement this vision, a comprehensive strategy is needed to reorganize local mobility systems in ways that complement rail transport. Cooperation among small municipalities and the reintegration of "thresholds" for public services would be essential to maximize efficiency, especially in low-density areas[18]. Reactivating the railway as part of a broader territorial policy would reconnect this area to the national network, promoting tourism, industrial and artisanal production, quality agriculture, and improving local services.

4.2 The experimentation: a hypothesis of territorial Masterplan and Axis Contract

The Axis Contract hypothesis has been developed through various research studies and presented at numerous conferences and publications (Ravagnan & Amato, 2020; Amato, 2021; 2022). This research is complemented by educational experiments carried out since 2021 within the Urban Planning Laboratory at the Department of Architecture, Roma Tre University, and the Urban Planning II course at the Faculty of Architecture, Sapienza University of Rome. Additionally, three master's theses in Architecture have focused on defining a "Territorial Masterplan and Axis Contract for the abandoned Civitavecchia-Capranica-Orte railway line." These simulations involved the "Committee for the Reactivation of the CCO Railway" and were supported by several municipal administrations along the line.

As part of various urban planning courses, detailed analyses were conducted on the territory intersected by the railway, from Civitavecchia to Orte. These analyses took into account the infrastructure and mobility

15 It's noteworthy that in the same year the Civitavecchia-Capranica-Orte railway was closed, the last remaining ironworks in Ronciglione, dating back to the Farnese family era, also shut down. The Farnese family had constructed a canal in the 15th century to supply water from the nearby Lake Vico, which powered the ironworks.

16 Source: Committee for the Reopening of the CCO Railway; Italferr, 2024.

17 In response to the growing demand for fast, small-package freight transport, Ferrovie dello Stato launched the Mercitalia Fast division in 2018. This division utilizes ETR500 high-speed trains, modified to carry Unit Load Devices (ULD), small containers used for loading goods onto aircraft. These trains operate between Bologna, a key logistics hub in Northern Italy, and Maddaloni-Marcianise in the South, a major logistics gateway.

18 Until 1934, Italy's administrative system divided Provinces into "Circondari," which were further divided into "Mandamenti," each consisting of several municipalities. These divisions ensured the provision of basic territorial services. However, this structure was abolished by a local authority reform implemented by the Fascist regime.

system, the settlement structure, the historical and environmental systems, as well as demographic and socio-cultural factors. This allowed for the development of a multi-scale functional model that addressed all the key aspects of the area, identifying both its resources and challenges.

From this, a "territorial project" was designed, starting with the Italferr project for the reactivation of the Civitavecchia-Capranica-Orte railway (2012). It was translated into a territorial Masterplan that outlined regeneration strategies aimed at reactivating and making the affected areas more resilient. This plan included both tangible and intangible interventions in mobility, housing, and historical and natural landscapes to maximize the positive impact of the railway within a network framework.

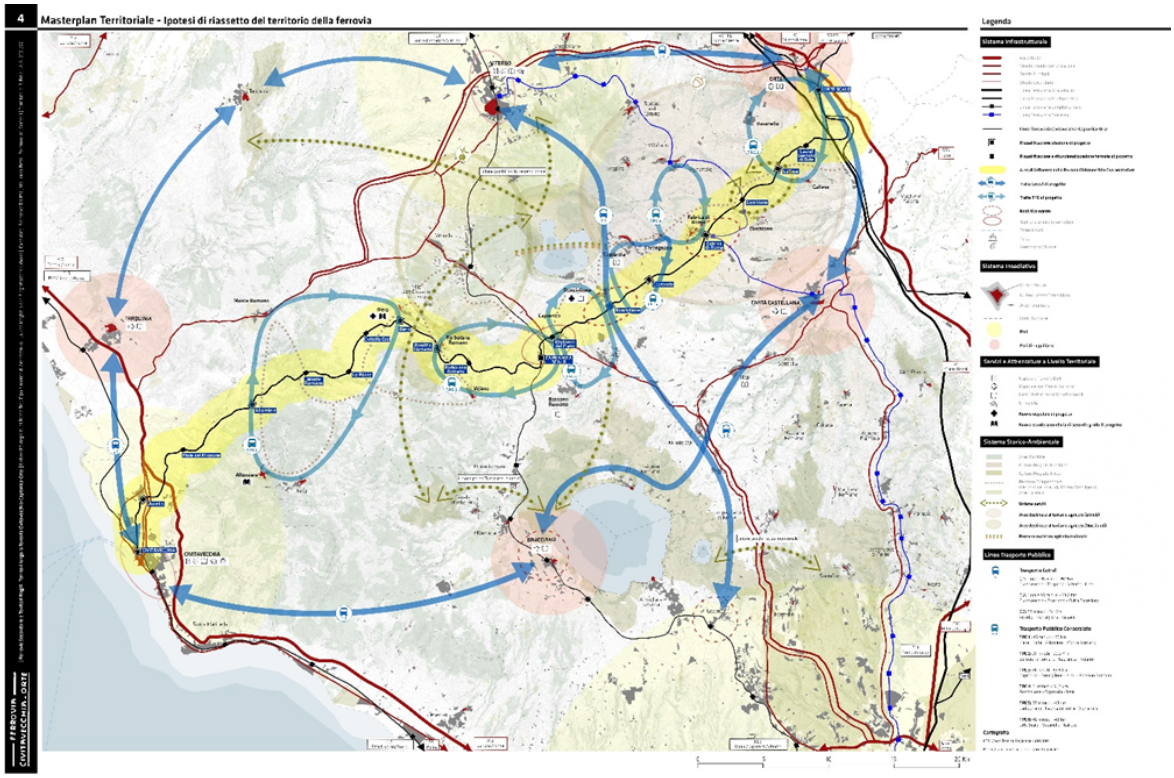


Fig.4 Hypothesis of a territorial master plan

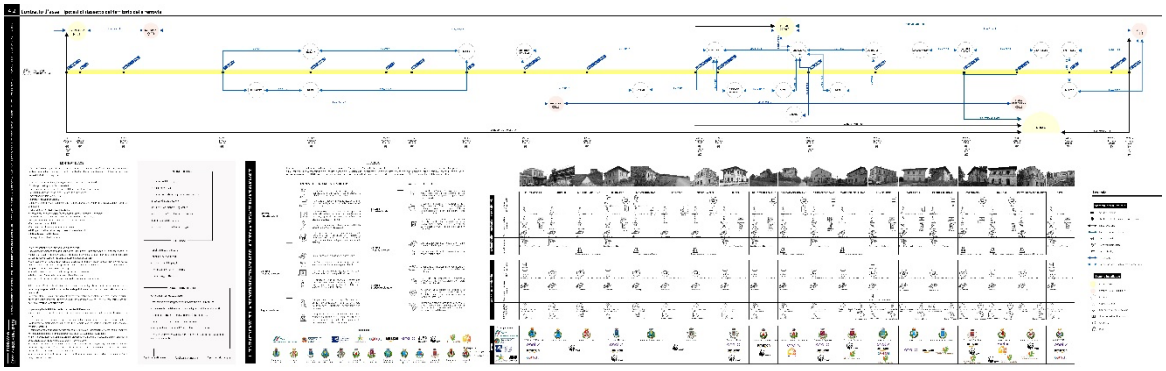


Fig.5 Hypothesis of a territorial master plan. Excerpt from the Axis Contract

The Masterplan, in particular, redefined mobility hierarchies by redesigning regional road transport, currently operated by Cotral (Lazio Region). It also proposed a local public transport system on a consortium basis to connect the various municipalities and railway stations. It integrated and networked supra-municipal public services, with a focus on higher education and local healthcare, and proposed interventions for the recovery, redevelopment, and urban and socio-economic regeneration of residential areas. The plan also sought to enhance and expand the network of protected natural areas, woods, lakes, and waterways, as well as the region's numerous archaeological, architectural, and artistic heritage sites.

The territorial Masterplan thus used the Axis Contract as an implementation and management tool, identifying the various actors involved in the project strategy. These included territorial and local authorities (Lazio Region, Viterbo Province, Metropolitan City of Rome, municipalities along the line, and heritage Superintendencies), public transport companies (Cotral), cultural associations, businesses in the region (Italia Nostra, Legambiente, Enel X), and specialized actors involved in projects like micro-logistics (Amazon) and sustainable hazelnut farming (Ferrero). For each of these actors, the terms of the "Contract" were defined, binding all parties involved (Fig.ss 4 and 5).

To achieve this, multiple meetings were held with key stakeholders in the area, simulating the process and results[19].

As part of the multi-scalar experimentation underpinning the integrated strategy of the Territorial Masterplan, the territories of the 11 municipalities along the Civitavecchia-Capranica-Orte railway underwent an in-depth analysis. The outcomes, in the form of Integrated Programs, were publicly presented in Barbarano Romano (November 2024) and later in Gallese (February 2025), the lead municipality of the railway consortium, in the presence of local administrations and representatives of the Committee for the Reopening of the C-C-O Railway (Fig.ss 6 and 7).

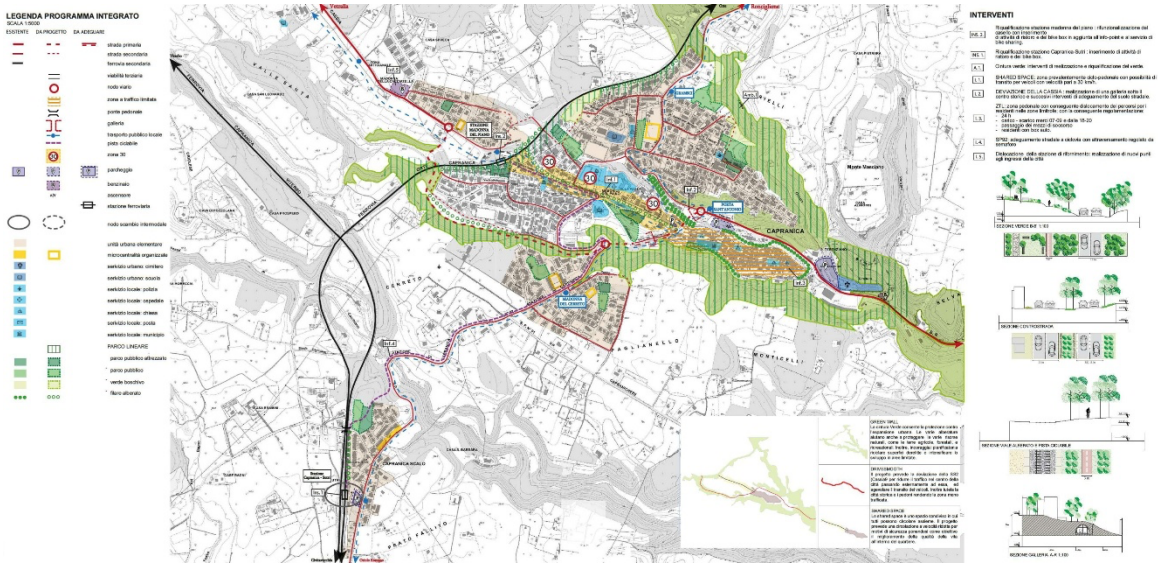


Fig.6 Integrated Program proposal for the Municipality of Capranica

Aligned with the overarching Masterplan, each Integrated Program identified a set of plans, policies, and projects aimed at maximizing the benefits of railway reactivation. These address key issues such as mobility - through the redesign of local public transport routes and, where necessary, road and rail infrastructure; urban and environmental quality - via the renewal of public and green spaces; and the preservation, restoration, and enhancement of the built heritage.

This experimentation refined several structural aspects of the Axis Contract tool. While it directly draws from the French Contrat d'Axe, it differs in key foundational aspects, including its objectives, the actors involved, and the territories covered.

[19] As part of the Urban Planning Laboratories (Master's Degree in Architecture-Urban Planning, Department of Architecture, Roma Tre University, academic years 2020/21 and 2021/22) and the Urban Planning II Course (Single-cycle Master's Degree in Architecture, Faculty of Architecture, Sapienza University of Rome, academic year 2024/25), held by Cerasoli, a *Seminar on the Civitavecchia Capranica Orte Railway* was held on March 24, 2021, with the participation of the "Committee for the reopening of the CCO Railway", and the study-day "*Secondary railways and fragile territories. An axis contract for the reactivation of the territories along the Civitavecchia-Capranica-Orte Railway*", on April 13, 2022, at the the Department of Architecture of Roma Tre University. Finally, a public meeting with the Mayors of the line, which was held at the Municipality of Barbarano Romano (Viterbo), on November 5, 2024.

Fig.7 Integrated Program Proposal for the Municipality of Allumiere: redesign of local mobility and public space project, photo insertion

One area for reflection concerns the fact that, while the French Contrat d'Axe primarily focuses on transport and settlement development aimed at selective densification - which can increase land consumption, traffic, and settlement pressure - the Italian version adopts a more holistic approach. Its goal is to guide the regeneration and redevelopment of existing areas, integrating social and environmental interventions with those focused on mobility, and promoting the conversion, reuse, and revitalization of abandoned and underutilized spaces, as well as the redevelopment of public spaces.

Another point is the geographic scope, which already constitutes a strategic and programmatic action. Unlike the French approach, which is confined to the immediate vicinity of the infrastructure, the Italian proposal extends to areas impacted by the infrastructure, including its catchment area. This broader scope takes into account the effects of the infrastructure, which can influence the performance of the mobility service.

A third difference lies in the integration of the Axis Contract within urban planning. While in France the link between the tool and urban planning is weak, the Italian version is deeply integrated into a strategic planning process. This process spans multiple scales, encompassing both territorial-metropolitan and local dimensions, with a strong focus on the "Right to Mobility." It connects strategic, structural, operational, and regulatory planning levels (Amato, 2024).

Finally, the process and stakeholder involvement differ significantly. One of the weaknesses of the French Contrat d'Axe is that its definition relies primarily on the technicians of the local administration and the transport service provider, excluding local communities and active stakeholders such as associations and private companies. In contrast, the Italian version is more inclusive, with a broader engagement of local actors. It is conceived as an evolved "program agreement" (L. 241 of 1990) that combines the benefits of joint planning and inter-institutional consultation with the establishment of a "permanent territorial table" (Cerasoli, 2012).

Nonetheless, it is important to recognize that the Axis Contract remains primarily a regulatory and methodological framework designed to facilitate the reuse or reactivation of railway lines. As such, it must be shaped and enriched according to the specific territorial context in which it is applied. This is particularly relevant when dealing with minor urban centers, inner areas, and territories distant from metropolitan areas, which often possess distinct historical trajectories, cultural phenomena, socioeconomic dynamics, and - most importantly - divergent future prospectives. These local specificities require careful and case-by-case investigation to ensure that the contract effectively supports context-sensitive regeneration processes.

4.3 Methodological tools and process in case study analysis

The methodology of this case study combines theoretical research, educational experiments, and practical applications in urban planning and infrastructure development. The conceptual framework is based on the Axis Contract hypothesis, focusing on a specific case: the creation of a "Territorial Masterplan and Axis Contract for the abandoned Civitavecchia-Capranica-Orte railway line." These projects, carried out in collaboration with the "Committee for the Reactivation of the CCO Railway" and supported by municipal administrations along the railway line, laid the foundation for developing the methodology applied in this study.

A crucial aspect of the methodology was the active participation of key stakeholders throughout the experimentation process. This included multiple rounds of meetings with local authorities, businesses, cultural associations, and other regional actors.

Through these discussions and simulations, the structural aspects of the Axis Contract tool were refined, deepening the understanding of how stakeholders perceive infrastructure's role in regeneration and how they can collectively contribute to the planning process.

The involvement of local actors was particularly important in identifying the needs and priorities of communities affected by the railway's reactivation. This comprehensive engagement provided a broad range of perspectives, contributing to a more robust, context-sensitive design for the proposed infrastructure.

The data collection process incorporated both quantitative and qualitative approaches to provide a holistic view of the challenges and opportunities presented by the railway’s reactivation.

Quantitative data were collected from regional and national transport authorities, identifying trends in mobility, such as shifts in travel behavior and regional transport demand. Geographic Information Systems (GIS) mapped existing infrastructure and transport networks along the railway line, offering a spatial understanding of how proposed changes would impact the region.

Qualitative data were gathered through interviews with a wide range of stakeholders, including local citizens, government representatives, transport companies, and community organizations. These discussions provided valuable insights into the social and cultural context of the project, shedding light on mobility needs, sustainability concerns, and implementation barriers. GIS tools also helped visualize these data, particularly in understanding the spatial distribution of settlements and transport networks.

Focus Area	Actions and Tools	Strategic Outcomes
Stakeholder Engagement	Roundtables, interviews, community forums	Shared vision among actors; identification of local needs and conflicts
Quantitative Data Analysis	Transport datasets, GIS spatial analysis	Mobility trends; regional connectivity; mapping of underserved areas
Qualitative Data Collection	Interviews, workshops, local narratives	Insight into socio-cultural dynamics; identification of sustainability concerns
Participatory Planning	Simulation of Axis Contract governance mechanisms	Testing coordination tools; refining co-decision processes
GIS Integration	Mapping of infrastructure, settlements, mobility services	Visualization of disparities and development potentials
Territorial Masterplan	Synthesis of Italferr plan with new regeneration strategies	Multi-sectoral project integrating mobility, housing, landscape, and public services
Policy and Planning Tools	Axis Contract hypothesis, multi-scalar territorial planning frameworks	Prototype of contract-based governance for inner area regeneration

Tab.1 Strategic Priorities and Outcomes

The qualitative data were analyzed to identify key themes and issues raised by stakeholders, helping to clarify priorities and concerns of local communities and identify areas of potential conflict or collaboration.
Based on this analysis, the study developed a "territorial project," starting with Italferr's 2012 plan for the reactivation of the Civitavecchia-Capranica-Orte railway. This plan was expanded into a broader Territorial Masterplan, outlining strategies to regenerate and revitalize the affected areas. The Masterplan integrated interventions across mobility, housing, and preservation of historical and natural landscapes to maximize the railway's impact on the region.
The iterative process of stakeholder engagement, data collection, and analysis refined the planning strategies, ensuring they were context-sensitive and aligned with broader sustainability and regional revitalization goals. Through this approach, the study presents a model for integrating infrastructure development with territorial rebalancing, emphasizing stakeholder engagement, multi-scale planning, and sustainability in regenerating inner areas.

5. Perspectives

The impact of infrastructure on inner areas has become an increasingly important topic in recent Italian scientific discussions (Amato, 2022). The growing focus on these "fragile territories" and their transformation from abandoned or underused spaces to areas of ecological revitalization and territorial rebalancing has also been central to national policies in recent years. This shift has highlighted the essential role that mobility infrastructure plays in fostering territorial cohesion and social equity, especially in the context of Italy's post-COVID recovery and the EU's green, ecological, and inclusive transition policies.
The 2020 pandemic marked a turning point, even in public opinion, regarding the unsustainability of life in large contemporary metropolises and the growing importance of rediscovering new rhythms and lifestyles, often found in smaller towns (Cerasoli & Mattarocci, 2020). This shift led to renewed attention on infrastructure - particularly railways - within Italy's Recovery and Resilience Plan (PNRR), which has positioned the improvement of railway networks in inner areas as a key driver for economic recovery. The PNRR emphasizes not only the construction and adaptation of rail infrastructure but also the integration of sustainability into infrastructure design, aligning with national and European objectives for ecological transition and inclusive development (MIMS, 2021).
However, despite significant innovations regarding the environmental sustainability of infrastructure projects, challenges remain in developing objective methodologies and indicators to assess the social and economic sustainability of infrastructure within territories. To address this, Ferrovie dello Stato, through Italferr and the FS Research Centre, is developing a Territorial Impact Assessment methodology. This approach aims to update the frameworks for evaluating the socio-economic and environmental impacts of railways in an integrated territorial context (Tartaglia et al., 2024). These efforts underscore the need for more effective tools in multi-scale, interdisciplinary governance, capable of assessing both the direct and indirect effects of infrastructure on urban and territorial transformations.
This study has also emphasized the importance of repurposing Italy's disused railway heritage, representing over 8,000 km of abandoned or underused lines. These disconnections have contributed to the depopulation and fragility of inner areas, which have long suffered from reduced accessibility. Integrating innovative transport solutions, such as shared mobility, on-demand services, and intermodal hubs, can revitalize these regions and provide sustainable alternatives to private car usage. Moreover, the growing focus on "tourist railways" through initiatives by the FS Foundation and local associations offers an exciting opportunity for local economic revitalization, as these projects provide both transportation and cultural enrichment.
The concept of *Right to Mobility* - which encompasses not only the freedom of movement but also the accessibility to sustainable, equitable, and socially inclusive transport options - remains central to this discussion. A comprehensive and integrated approach that combines urban planning, mobility strategies, and

environmental sustainability is necessary for fostering resilient communities in Italy's inner areas. Models like the French *Contrat d'axe*, which aims to integrate urban densification with public transport infrastructure, offer valuable lessons for Italy, highlighting the potential of infrastructure as a tool for territorial rebalancing and regeneration.

In conclusion, the transformation of infrastructure in fragile territories must consider both environmental and social sustainability, leveraging integrated planning to reconnect these areas to broader economic and social systems. By addressing the specific needs of inner areas and investing in innovative mobility solutions, we can promote a more inclusive and sustainable future, revitalizing not only transport networks but also the communities they serve. The combination of strategic territorial planning, stakeholder engagement, and an integrated approach to infrastructure can pave the way for a more balanced and equitable territorial development in Italy.

Note

The article is the result of the strong collaboration of the two Authors. Specifically, Chiara Amato edited: § 2.2, 3, 4,2 and 4.3; Mario Cerasoli edited: § 1, 2.1 and 4.1. The § 5 is the result of joint work.

References

Allegra, M. & Casaglia, A. (2010). La dimensione urbana del conflitto: città divise, contese e segregate. In *Storia Urbana*, 3, Fascicolo 128. Roma: FrancoAngeli. https://doi.org/10.3280/SU2010-128002

Amato, C. (2024). Infrastructure Corridors for Territorial Projects. The Contrat d'Axe in France and the experimentation in Italy. In Monardo B., Ravagnan C. (Eds.). *Emerging Mobility Paradigms towards the Resilient Metropolis*, Tab Edizioni, 218-237. ISBN: 978-88-9295-806-7

Amato, C. (2020). La riattivazione della Linea Zaragoza-Canfranc-Pau. In: Ravagnan C., Amato C., *Percorsi di resilienza. Riuso e rilancio delle ferrovie in dismissione nei territori fragili tra Italia e Spagna*. Roma: Aracne Editrice, 193-197. ISBN: 978-88-255-3841-0

Amato, C. (2021). *Il diritto alla mobilità. Riequilibrio territoriale, mobilità sostenibile e inclusione sociale nelle strategie di rigenerazione urbana*. Roma: Aracne Editrice. ISBN: 978-88-255-4105-2

Amato, C. (2022). L'ipotesi del Contratto d'Asse per il Diritto alla mobilità. In: *Urbanistica Informazioni* 302, 163-166.

Amato, C. & Ravagnan, C. (2020). Territori fragili, marginalità e nuovi diritti. Nuovi riferimenti operativi. In Ravagnan C., *Rigenerare le città e i territori contemporanei. Prospettive e nuovi riferimenti operativi per la sperimentazione*. Roma: Aracne Editrice. ISBN: 978-88-255-2741-4

AUAT, Tisséo-SMTC (2007). *Guide méthodologique pour la mise en oeuvre des contrats d'axe. Des contrats d'axe: pourquoi? Comment?*, Toulouse: AUAT.

Bentayou, G., Perrin, E. & Richer, C. (2015). Contrat d'axe et Transit-Oriented Development: quel renouvellement de l'action publique en matière de mobilité et d'aménagement? In: *Flux*, 101-102, 111-123. https://doi.org/10.3917/flux.101.0111

Cerasoli, M. & Mattarocci, G. (2020). *Un futuro per i centri storici. Scenari possibili nell'era post Covid*. Roma: Aracne Editore. ISBN 9791259943620

Cerasoli, M. (2020). Ferrovie e pseudo-liberalizzazione: quali effetti su territorio e mobilità? In: Ravagnan, C., Amato, C., *Percorsi di Resilienza. Rilancio e riuso delle ferrovie in dismissione nei territori fragili tra Italia e Spagna*. Roma, Aracne editore, 130-142. ISBN 9788825538410

Cerasoli, M. (2015). Qualità urbana, mobilità, qualità della vita: una "grammatica" per il Rinascimento della città*,* in *Urbanistica Informazioni*, *263*, 16-19.

Cerasoli, M. (2012). *Politiche ferroviarie, modelli di mobilità e territorio. Le ferrovie italiane nell'epoca della pseudo-liberalizzazione*. Roma: Aracne. ISBN: 978-8854855465

Colleoni, M. (2019). *Mobilità e trasformazioni urbane. La morfologia della metropoli contemporanea*. Milano: Franco Angeli. ISBN: 9788891780621

Dematteis, G. & Governa F. (2001). *Contesti locali e grandi infrastrutture. Politiche e progetti in Italia e in Europa*. Roma-Milano: FrancoAngeli.

Dody, D., Ronsivalle, D. & Carta, M. (2025). Revitalising abandoned historical districts. Application of an incremental and adaptive approach to regeneration. *TeMA - Journal of Land Use, Mobility and Environment*, *18* (1), 75-94. https://doi.org/10.6093/1970-9870/11114

Estanqueiro, R. & Cerasoli, M. (2018). *Rome outskirts, Multidisciplinary survey on the transformation of settlement models*. En: Libro de proceedings, CTV 2018. XII Congreso Internacional Ciudad y Territorio Virtual. Ciudades y Territorios Inteligentes. Mendoza, 5-7 septiembre 2018. Barcelona: CPSV, 2018, 97-114.

Fabbri, M. (1983). *L' urbanistica italiana dal Dopoguerra a Oggi. Storia, Ideologie, Immagini*. Bari: De Donato Editore.

Harvey, D. (2012*). Il capitalismo contro il diritto alla città*. Verona: Ombre corte.

Kaufmann, V. (2002). *Re-Thinking Mobility: Contemporary Sociology.* Londra: Routledge.

ITALFERR (2012). *Relazione Generale. Progetto definitivo. Ripristino di un collegamento ferroviario tra il Porto di Civitavecchia e l'asse prioritario TEN-T n.1 e la località Orte.* Roma, Aremol Agenzia Regionale per la Mobilità - Regione Lazio.

Lauri, C. (2020). Centri storici, piccoli comuni e cooperazione intercomunale. In: Ravagnan C., Amato C., *Percorsi di resilienza. Riuso e rilancio delle ferrovie in dismissione nei territori fragili tra Italia e Spagna.* Roma: Aracne Editrice, 59-67. ISBN 9788825538410

Lefebvre, H. (1968). *Le droit à la ville,* Trad. ita: (2014) Il diritto alla città, Verona: Ombre corte.

Liistro, M. (2001). *La ferrovia Civitavecchia-Orte. Recupero e riuso delle ferrovie secondarie dismesse per la fruizione dei beni culturali e territoriali. Un caso di studio*. Roma: Editrice Librerie Dedalo.

Marcarini, A. & Rovelli, R. (2018). *Atlante Italiano delle ferrovie in disuso.* Firenze: Istituto geografico militare.

Menduni, E. (1999). *L'Autostrada del Sole.* Bologna: Edizioni Il Mulino

MIMS (2021). *Linee guida per la redazione del progetto di fattibilità tecnica ed economica da porre a base dell'affidamento di contratti pubblici di lavori del PNRR e del PNC* (Art. 48 comma 7 DL 31 maggio 2021 n.77 convertito in Legge 29 luglio 2021 n. 108).

Monardo, B. (2003). Mobilità urbana, servizi di trasporto e nuove istanze sociali. In: Karrer F., Ricci M., *Città e nuovo welfare. L'apporto dell'urbanistica nella costruzione di un nuovo stato sociale*, Roma: Officina Edizioni,156-184.

Panato, I. (2013). *Il contributo della mobilità alla giustizia sociale secondo l'approccio delle capabilities.* Tesi di dottorato, Ciclo XXV Scuola dottorale in Culture e trasformazioni della città e del territorio - Politiche territoriali e progetto locale, Università degli Studi Roma Tre, Dipartimento di Architettura.

Pinto, F. & Fossati, A. (2020). "Itinerario Cicloturistico Adda". A route between a variety of territories, landscapes and identities. *TeMA - Journal of Land Use, Mobility and Environment*, *13* (1), 81-97. https://doi.org/10.6092/1970-9870/6608

Prezioso, M. (2020). *Territorial impact Assessment of national and regional territorial cohesion in Italy. Place evidence and policy orientations towards european green deal.* Bologna: Patron Editore. ISBN 9788855534864

Poli, I. (2020). *Città esistente e rigenerazione urbana. Per una integrazione tra urbs e civitas.* Roma: Aracne Editrice.

Pucci, P. & Vecchio, G. (2018). Mobilità e inclusione sociale. Pianificare per vite sempre più mobile. In: Atti della XI Conferenza Nazionale SIU *Confini, Movimenti, Luoghi, Politiche e Progetti per città e territori in Transizione*.

Pucci, P. (2014). Mobilità. Tre chiavi interpretative e alcuni paradossi. In: *L'urbanistica italiana nel mondo*. Atti della XVII Conferenza Nazionale SIU. Milano.

Purcell, M. (2014). Possible worlds: Henri Lefebvre and the right to the city. *Journal of urban affairs*, *36* (1), 141-154. https://doi.org/10.1111/juaf.12034

Ravagnan, C. & Amato, C. (2020). *Percorsi di resilienza. Riuso e rilancio delle ferrovie in dismissione nei territori fragili tra Italia e Spagna*. Roma: Aracne Editrice, 193-197. ISBN: 978-88-255-3841-0

Ravagnan, C., Cerasoli, M. & Amato, C. (2022). Post-Covid cities and mobility: A proposal for an antifragile strategy in Rome. *TeMA - Journal of Land Use, Mobility and Environment*, 87-100. https://doi.org/10.6093/1970-9870/8652

Région Aquitaine (2013). *Contrat d'axe du Béarn.* Retrieved from: https://www.cc-lacqorthez.fr/fileadmin/documents/Transport/Contrat_d_axe_Be__arn_Valide.pdf

Sellari, P. (2011). Uno sguardo alle ferrovie italiane nell'Ottocento postunitario. *Studi e Ricerche socio- territoriali*, 1-2011, Napoli, 99-122

Tartaglia, M., Martin, S., Ravagnan, C. & Amato, C. (2024). The role of railways toward sustainable and cohesive territories. An integrated approach for the territorial impact assessment. In: Sepe M. (Eds.), *Inclusive Cities and Regions*. 14° Biennale of European Towns and Town Planners. Roma: INU Edizioni.

Zagrebelsky, V., Chenal, R. & Tomasi, L. (2016). *Manuale dei diritti fondamentali in Europa*. Bologna: il Mulino.

Image Sources

Fig.1: Civitavecchia - Capranica - Orte railway line (source: author's photo)

Fig.2: Via Verde Costa dei Trabocchi (Source: Ebiketravel.it)

Fig.3: Contract d'axe for the "E" tram line in Grenoble (Source: L'Agence d'Urbanisme de la Region Grenobloise, 2022);

Fig.4: Hypothesis of a territorial master plan (Marianna Petti, Francesca D'Uffizi, 2024 - revision and integration by prof. dr. Cerasoli, Department of Planning, Design and Technology of Architecture, Sapienza University of Rome. Graphic processing by Sandra Morcate Rizo);

Fig.5: Hypothesis of a territorial master plan. Excerpt from the Axis Contract (Marianna Petti, Francesca D'Uffizi, 2024 - revision and integration by prof. dr. Cerasoli, Department of Planning, Design and Technology of Architecture, Sapienza University of Rome).

Fig.6: Integrated Program proposal for the Municipality of Capranica (Urban Planning II Course, Single-cycle Master's Degree in Architecture, Faculty of Architecture, Sapienza University of Rome, academic year 2024/25).

Fig.7: Integrated Program Proposal for the Municipality of Allumiere: redesign of local mobility and public space project, photo insertion (Urban Planning II Course, Single-cycle Master's Degree in Architecture, Faculty of Architecture, Sapienza University of Rome, academic year 2024/25).

Author's profile

Chiara Amato

She is an architect, currently Urban Planner at Risorse per Roma S.p.A. (in-house company of Rome Municipality). In 2021 she obtained a PhD in Urban Planning at Sapienza University of Rome with a dissertation on the right to mobility and urban regeneration and recently completed a research fellowship at Roma Tre University within the cooperation project Oriental Cuba Small Historical Centres. She participates in several international research groups on mobility models and infrastructure policies for fragile territories and has contributed to cooperation projects in Latin America. Former Sustainability Specialist at Italferr (Ferrovie dello Stato Group), she previously collaborated with professional firms on urban and public space projects. Author of essays and volumes on research and cooperation outcomes, she also teaches in graduate and postgraduate programmes.

Mario Cerasoli

He is an architect, PhD in Urban and Regional Planning (Sapienza University of Rome), and Associate Professor of Urban Planning at Sapienza (since 2024) and previously at Roma Tre University, where he taught since 2002 and served as researcher and associate professor. His research focuses on infrastructures, mobility, settlement rules, and the renewal of historic centres, with projects at national and international level, including development cooperation. He coordinated the OCSHC project on Cuban historic centres (2022-24) and directs scientific initiatives such as the International Congress Virtual City and Territory 2025. He has held visiting positions at UPC Barcelona and contributes to doctoral and master programmes in Rome, Barcelona, and LUISS. Author of numerous publications, he lectures widely in Europe and Latin America.