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Moving in/to intermediate areas. Emerging challenges and railway infrastructures transformations.

[Muoversi nelle aree intermedie. Sfide emergenti e trasformazione delle infrastrutture ferroviarie.]

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SUMMARY

ABSTRACT OF THE RESEARCH

This doctoral research project focuses on the link between territorial and infrastructural transformations through the lens of railway mobility practices, investigating the role of infrastructures in the building of different socio-territorial landscapes.

Through a multi-methods methodological approach (combining qualitative tools and socio-territorial mapping), the research investigates the so-called "Intermediate Areas", providing a synthetic framework regarding the possible definitions and dynamics currently in place with particular attention to the dynamics of mobility and commuting to, from and through and how these are intertwined with territorial processes and urbanisation tout court. The case study context is represented by the areas of North-Western Italy, along the axes of the provinces of Alessandria, Asti, Vercelli and Biella in virtue of the potential processes of territorial marginalisation of an area undergoing profound transformation also (but not only) in light of the post-Fordist transition. The results, by describing the ongoing macro dynamics and the actual mobility practices of various mobile populations, contribute to renewing the gaze and the lexicon on urban transformation starting from the 'intermediate' scenario typical of the Italian urbanisation context subject to important challenges also in terms of sustainable transition.

Il presente progetto di ricerca dottorale si concentra sul nesso tra trasformazioni territoriali e infrastrutturali attraverso la lente delle pratiche della mobilità ferroviaria, indagando il ruolo delle infrastrutture nella costruzione di diversi panorami socio territoriali.

Attraverso un approccio metodologico multi-methods (unendo strumenti qualitativi e mappature socioterritoriali), la ricerca indaga le cosiddette "Aree intermedie", fornendo un quadro sintetico relativo alle possibili definizioni e dinamiche in corso con particolare riferimento alle dinamiche di mobilità e di pendolarismo da, verso e attraverso e come queste siano intrecciate nella pratica ai processi territoriali e di urbanizzazione *tout court*.

Il contesto di riferimento è rappresentato dalle aree del Nord Ovest Italiano, lungo gli assi delle province di Alessandria, Asti, Vercelli e Biella in virtù dei potenziali processi di marginalizzazione territoriale di un'area in profonda trasformazione anche (ma non solo) alla luce della transizione postfordista. I risultati, descrivendo le dinamiche macro in corso e le effettive pratiche di mobilità di diverse popolazioni mobili, contribuiscono a rinnovare lo sguardo e il lessico sulla trasformazione urbana a partire dallo scenario "intermedio" tipico del contesto di urbanizzazione italiana soggetto a importanti sfide anche sul piano della transizione sostenibile.

SYNTHESIS OF THE RESEARCH

This proposal explores territorial transformations dynamics from the perspective of the "intermediate areas" contexts, through the lenses of mobility and infrastructure.

It problematizes the issues of changes in mobility practices and patterns supported and linked by the shift in railways and more in general in the mobility system. Indeed, this research deal with multiple and intertwined transformation of the territorial context and the infrastructural vector.

This study proposes a multi methods approach (merging socio - territorial mapping tools and qualitative ones) with the specific aim of understanding the mobility pattern, practices and capacities of inhabitants, travelers, and commuters in the context intermediate areas of Northwest Italy.

This research project is placed at the corner between several theoretical approaches and disciplinary perspective that follow the multiple traditions of studies on territorial transformation, mobility and transport: from geographers to urban planners, from scholars of economics to local development, this research is more explicitly placed in the tradition of Urban Studies with specific regards to Urban Sociology, Territorial and Environmental Studies.

Starting from a theoretical background that considers territory as a historical product, a palimpsest (Corboz 1985) irreducible to a single unit but crossed by underlying dynamics and by more or less visible "monuments" witnessing geographies of centrality and marginality shaped by time and space, the research investigates the processes of territorial transformation starting from the role that mobility infrastructures have in defining the practices of (a)systematic movement in space. The practices in turn constantly redraw the relationship between the practiced and the administrative map, negotiating the same interpretative and organizational categories.

The difficulties in understanding territorial transformations due to the inadequacy of tools in describing urban transformation outside the municipal and administrative frameworks is a knot that has been festering for decades, already Martinotti (1993) highlighted the new becoming of the metropolis" in which "as the city transforms itself into a metropolis, the distinct definition of the difference between city and countryside drops". Nevertheless,   this challenge has been grasped several times by scholars. Several research focused and analyzed settlement forms, patterns and territorial transformations processes actually outside the urban and metropolitan cores (ITATEN, Clementi Dematteis & Palermo 1996), overcoming the mere administrative classification/ boundaries. To these field of literature, this research owes much.

In the European city context this process is related to the central role that the complex and entrenched network of medium-small cities has played. Medium-small cities have formed the skeleton of the European urban landscape and its historical configuration (Bagnasco and Le Gales 2001; Trigilia 2014). The processes of urbanization and suburbanization are thus linked to this network of socio-territorial pre-existences with which they con - fuse. Suburbanization, peri-urbanization are not only the process of overflow of the city out of its "boundaries" but results of a more complex relationship in which medium-small cities and pre-existences are a relevant actor.

For these reasons briefly highlighted, an interest in looking at processes of spatial transformation from the definition of an intermediate level is outlined in the research.

To delineate the context an instrumental definition is considered: where «middle towns» are a crucial component but not the only. Indeed, in the proposed frame a complex scenario both out of the direct orbit of metropolitan areas and both out the notion of «inner areas» converge. If literature largely emphasizes metropolitan areas and recently a new interest in inner areas (De Rossi 2018) became evident, areas that can't be ascribed in neither these models are barely at the center of scientific inquiry of Urban Studies.

Starting from this, this research has in the mobility and infrastructural component specific lenses of reading territorial transformations due to the so called "morphogenetic" role of major infrastructures, in structuring territories and cities. The attempt to look at territorial transformations through the processes of mobile infrastructures is a long-term exercise, Martinotti (1993) pointed out that what contributed to redefining the form (and substance) of cities was the progressive expansion of the mobile potential of certain social groups that covered ever greater distances for their activities, supported first by the arrival of mechanised means and then by the speeding up and differentiation of these.

The main research aim is summarized in providing the analysis of territorial transformations, in terms of processes and urbanization dynamics, social morphologies and practices, material and immaterial relations, including potential processes of territorial hierarchization, fragmentation and marginalization. The process of territorial transformation is deeply related to and shaped by the transformation of the infrastructural layer, reason why the second aim of the research rely in the analysis of the railway sector, selected among the other mobility infrastructure because of the crucial change that has known in last decades that directly focus on the processes investigated. Nevertheless, first two aims of the research converge in the analysis of the micro scale of mobility patterns and

practices by train of inhabitants, commuters and travelers, analyzing the redefinition of accessibility and capacity to move in intermediate areas.

As will be argued, research questions revolve around the knot of significance, symbols and cultures of (railway) mobilities (Urry 2007; Sheller 2018) in the context of intermediate areas and how support accessibility (Kenyon et al 2002) to service, participation, engaging in activities and (self)representation practices of the spaces where people live and move. At the same time, this allows us to look at the related risks of exclusion and social and territorial inequality. In this sense, research questions of the work start from the ones more general about connections and disconnection territorial related to infrastructure processes on railway field and related mobility practices in the specific context of Northwest Italy (investigating mainly the axes of the Alessandria, Asti, Vercelli and Biella provinces).

The research in this sense is focused on the processes of territorial reconfiguration of "intermediate areas" investigating the specific role that infrastructure and mobility, synthetized by the railway system, have on this.

Considering mobility, mobility infrastructures and the territorial processes not only as technical outcome of socio-economic matrix, but I will also provide a multi methods approach helpful in framing complex issue from different perspectives and gazes. Relying in multiple approaches and tools could be useful to overcome limits of each approach: the use of qualitative methods give depth on everyday making to quantitative ones, on the other side, quantitative analysis could support in orienting qualitative gaze.

With the help of socio territorial tools such as QGis and secondary data analysis the research provides several cartographies that summarize intermediate areas definitions and dynamics, the mobility and infrastructure analysis with the variation of service demand and supply and the portrait of the catchment areas of the reference stations.

At the same time qualitative (Cardano 2011) field-based research has been carried out through the ethnographic approach of "being in" and "being with" (Passaro 1997; Semi 2010) or in this case to travel with (Urry 2007), establishing relational dynamics, (observation, participant observation, interviews,) with the multiple actors involved in infrastructure processes and with mobile people.

In this perspective, starting from the transformative power of the new mobility paradigm, Urry underlines the need for "new mobile rules" (Urry 2007) in sociological methods. Indeed, also methods «need to be on the move in effect to simulate in various ways the many and interdependent forms of intermittent movement of people, images, information and objects» (Urry 2007).

Railway in this approach can be considered as a complex field where multiple layers and contacts exist with both institutional and "bottom up", formal and informal point of access. The research considers relevant in the building of the meanings of mobility and territorial anchorages the whole environment that revolve around railway (from the threefold perspective of users, service, and environment where commuters converge but also travelers, retired, workers, associations, trade unions and passionate).

In this context, the perspective of listening and dialogue of the ethnographic discipline allows a new look not only on formal policies and systems but also on socio-territorial needs, formal vacuums and the social reproduction of routinized actions such as practices.

In answering the RQs the expected results concern a complete understanding of intermediate scenarios - non-metropolitan and non-inner- in the Italian context. Clearly, these results may be useful for an understanding of the intermediate scale more generally in Europe, once compared with the contexts on the ground.

A more complex definition of intermediate areas that includes contexts that are now analysed separately would provide a clearer idea of the important demographic, spatial and public role of these contexts. A broader view of these contexts would also allow the possibility of integrated policies in the sustainable transition process.

Secondly, a closer look at the intermediate areas of NW Italy would allow a field test of the risks of spatial and infrastructural marginality highlighted by literature.

Finally, a more complete picture of railway mobility dynamics, practices, flows and demand in the intermediate areas is expected with the related expectations and mobility cultures.

CHAPTER 1

INTRODUCTION AND BACKGROUND

> Much of physical territory of the Europe does not fit classic 'urban–rural' typologies but can best be described as 'territories-in-between'. There is considerable agreement that TiB is pervasive and very significant. However, typologies of territory or spatial development continue to employ only degrees of either urban or rural (Wandl et al 2014 p. 50)

1.1 RESEARCH INTERESTS AND BACKGROUND

Initial interests, questions, and objectives of the research of this doctoral thesis project are multiple and have been adjusted during the course of the work.

This work explores territorial transformations dynamics from the perspective of the so called "intermediate areas" contexts, through the lenses of the transformations of the mobility system in its multiple facets.

Specifically, the proposal aims to problematize the issues of changes in mobility practices and patterns supported and linked by macro and micro transformations in railways and more in general in the mobility system. In other words, this work deal with the analysis of the structure and the dynamics of public transport offer at the local and supralocal scale with specific attention on the rail component and the resulting impact on mobility demand and accessibility. This work deals with the aim of analyzing the structure and dynamics of public rail transport supply in North-West Italy and the consequences on systematic and asystematic mobility of populations living in its intermediate areas.

Starting from this, the research project is interested in unravelling the entangled knot of mobility (Cfr Chapter 2.2) that results from (1) the demand considered in terms of actual and potential practices, desires, needs and wills, (2) infrastructures, services, public and collective transport, railways and (3) the complex system of policies and strategies.

In this sense, one of the premises of the work consider mobility, infrastructure and consequently accessibility as lenses and crucial variables in the definition of the territorial assets and transformations.

Thus, the theoretical argumentation has been operationalized in the three main dimensions in which the project can be read and around which the research design is built that will be summarized in the following paragraph. Fist area of interest covers the territorial transformation, the second one is

focused on the processes that regards mobility infrastructure and lastly, third, dimension deepen mobility demands, practices and representations of people that live and move in the context.

Expected outcomes thus regards a more depth comprehension of consequences on meanings and expectation, inclusion and exclusion dynamics of people that live and move in the *intermediate areas* nowadays. The work also includes boxes that provide more in-depth coverage of specific topics, which are useful for the reader to better contextualize some of the phenomena and topics covered in the thesis.

1.1.1 Where this thesis come from

This research topic was the subject of a master's thesis research previously conducted between 2018 and 2019 entitled: «Building Distances. Infrastructures and practices of mobility along the Turin-Genoa railway line» [Original Title: Costruire le distanze. Infrastrutture e pratiche della mobilità lungo la linea ferroviaria Torino – Genova] (Lacqua 2022).

That work was focused in framing the relationship that infrastructures, in this case railway infrastructures, have in terms of the construction and overcome of distances and of the territories themselves, how far they distance themselves, moving closer together and further apart, on the basis of strategic changes and political choices relating to mobility.

In the previous work**,** the analytical core of the socio-territorial production of inequalities was identified from mobility infrastructures as these contribute to the social, political and territorial construction of inequalities. If the starting question was to investigate the ways in which distances are "built" from both a material and a discursive point of view, it was highlighted out how infrastructural transformations (of which, for example, high-speed railways are the most evident but not exclusive) completely recalibrate the experience of mobility in terms of the conception of travel, the perception and parameters of distances, and the dimensions of movement. This happens simultaneously with respect to both the movement capacities of users, travelers, passengers and "from the inside", from the point of view of the operator: for example, with respect to the reorganisation of the different types of services but also with respect to how the processes of technologization and automation of work, which have occurred over the last three decades, have changed the very gestures, the spaces of agency of the worker and have contributed, among other reasons, to a consistent (numerical) reduction in staff. Main dimensions investigated by the previous work can be summarized as follows:

First, starting from a methodological approach of the railway as a 'field', the different possible levels of investigation of the phenomena that take place simultaneously within it were disentangled: the

station, the tracks, the wagons and the train itself. These are elements that, together, constitute the railway 'ecosystem', but which, individually, are configured as different and singular 'fields'. Moreover, the ethnographic complexity of the study of infrastructures is related to the ambiguous regimes of visibility and invisibility (Star 1999) "making the infrastructure evident in its lack or break, as well as in terms of obstacle and socio - territorial exclusion, producing multiple concepts of space and modernity".

In line with these methodological premises, the previous work investigated how the structural change of railway had occurred in practice and how it had been perceived by workers and users. The complex relationship delineated by the interaction between the mobile, residential, and work variables had considered a vast material that had allowed an initial look at: (i) the processes of territorial centralization and de - centralization processes in terms of the attractiveness of local, urban and transport hubs and nodes, the dynamics of attraction of flows and the critical definitions of attractiveness. At the same time, has been considered what motivates (systematic and a-systematic) mobility paths and the rationales behind them, what Urry (2007) defines as "why move" in his famous book Mobilities.

Regarding the results, it was seen how reasons of economic, relational, work-related, and service-related nature are embedded in a continuum within which discursive practices around one's place of living and the desires and needs to move draw complex maps with respect to territorial centrality starting from the specific character of places. These "maps" are delineated within the schema: where I want to live/where I have to go; where I have to live/where I want to go.

Moreover, it has been highlighted how the renewal of mobility practices and possibilities and multi-localism are also indicative of a radical change in the labor market and its territorial anchors. A long-term change that can be seen similarly in the landscape from the windows of the trains along the axe of the research in the long transformation from post-industrial production.

The previous work also had begun to focus on the relationship between urban centralities and territorial *otherness*: a "rest" difficult to define that include for example suburban, periurban territories, mid and small cities and inner areas. The intermediate stops between terminuses (capolinea) of the railway line examined had provided the scientific and territorial glue. This interest allowed to start the inquiry towards the processes of urbanisation and regionalization, the scalar processes and the hierarchical interdependencies mediated by the Turin-Genoa railway line.

Lastly, a crucial disciplinary linguistic topic in the study of urban, infrastructure and mobility had emerged and highlighted from that work. Indeed, since studying urban mobility, enabled by transportation and infrastructures, means studying its technical elements, such as the railway infrastructure, the analysis of the railway thus bears the burden of the difficult relationship between

technical studies and social studies within a difficulty of conventional languages, comprehensible between disciplines.

1.2. LITERARY BACKGROUND

The present research project is placed at the corner between several theoretical approaches and disciplinary perspective. The interest here is to propose a multiple approach that, starting from Urban Studies would be able to talk with different disciplinary approaches. Given the three – dimensionality of the work, the present paragraph and the theoretical chapter presents the same structure (CFR. P.48)

The lens that this work proposes in reading territorial transformations and specifically the dynamics of intermediate areas is the one of infrastructure. The role that infrastructures, especially those of mobility, have played in the processes of urbanization is crucial. The dynamics of Italian urbanization, urban diffusion, suburbanization, periurbanization, have been shaped and, at the same time, have shaped today's infrastructural landscape, first along the railway axes, then in relation to the road network. Dematteis (2001), in this sense highlighted the "morphogenetic" role of major mobility infrastructures, in terms of the ability to structure territories and cities.

Processes, such as road construction, opening of railways have historically marked the landscape and emerged as dense attractors (Shipper and Schot 2011) building materially connections, new sense of belongings and the territory as a whole.

Defining infrastructure, as the theoretical chapters (pp. 49 - 64) will argue more specifically, mobility infrastructure can be read within the *broader* framework of the so called "foundational economy".

«Foundational economy» is outlined in terms of «goods and services necessary for everyday life, used every day by all citizens regardless of income, and distributed to the population through networks and branches» (Collettivo per l'Economia fondamentale 2019 p. 26). In other words, they are *the basis for daily* life. This perspective can be useful to redefine infrastructure ontologies within a unitary analytical frame in which the multiple infrastructural typologies and layers converge from those of mobility and logistics to those of social, welfare, environmental and digital network, overcoming the polarization between the explicitly material infrastructure and the rest.

Mobility infrastructures and its elements such as railway lines, tracks and stations are inserted in a complex system of material and immaterial system that allow the everyday life and the exercise of citizenship rights, reason why conceptually and operatively they need, or at least they should, needs to be synchronized in terms of location and temporalities as an integrated system.

Infrastructure as thus considered as «territorialized» goods and services (Barbera et al 2016) and, therefore, useful in a research interest that has a crucial component in the territorial view: cables and pipelines, networks and branches that allow connection to essential services such as water, electricity, retail banking, food, public transport, roads, up to the welfare state.

The interest in intersecting territorial change, mobility infrastructure and rail derive moreover from another crucial point that here is synthetized. Indeed, *intermediate* areas, and specifically, post productive ones, are low dense territories, characterized by settlement dispersion and planning disorder and car dependents areas. In these terms new challenges regard a shift towards new mobility patterns, highlighting the role that railway infrastructure could have «in going after the dispersion» (Pucci 2015).

This topic regards thus the issues of environmental transition and the need to rethink post productive territories (Armondi et al 2022): these points open new challenges especially through railway mobility perspective in order to emphasize publicly and scientifically the urgence of possible alternatives beyond car systems and less car dependent contexts (Mattioli et al 2020; Pucci 2023).

In this sense, challenges regard at the same time mobility dynamics and livability of places, both within intermediate areas, both in scalar terms of interconnection between large metropolitan areas and more peripherical inner areas at a lower density. The role of intermediate areas can be crucial and railway mobility, united with other public transport mean, in terms of network, reconnecting main poles with more peripherical, as some scholars argue in terms of AVR, High Speed Network (Beria and Debernardi, 2021; Beria 2020).

This crucial point calls into account the need to look at regard the consequences not only in terms of territorial *performance* but especially to consider mobility and infrastructure as ways to reduce socio spatial inequalities, ensure a more just ecological transition.

Mentioned point introduces the importance on focusing on rail mobility among the other means of transport in investigating territorial change. Indeed, there are other several reasons that this work will deal with.

In line with the international context, from the 90's a big transformation crossed the railway sector, it regarded the political, managerial, and strategic vision of railway. Regionalization, privatization, division between market (HS) and basic/local provision, division between service provider and infrastructure owner, launch of High-Speed Lines, new management system and cultural company

transformation (Maggi, 2009) are only a few of the more visible elements of the extent of the change. From one big national company, progressively we assisted to the processes of liberalization and privatization of railway transport and the separation into a variety of different companies.

"Infrastructural" transformations thus completely recalibrate the mobility experience in terms of travel conception, perception and parameters of distances, travel figures. This happens simultaneously with respect to both the movement capabilities of users, travelers, passengers and "from the inside/ from the operator's point of view.

The transformation of the rail vector has had different role and weight whether looking at it from different spatial perspectives: the closure of minor lines, the concentration (Maggi 2017; Salento Pesare 2016) of attention on fast and market lines, the focus on high-speed stations in metropolitan cores, are just a few elements that can be taken into consideration when looking at rail transformations from the perspective of the so-called intermediate areas, from the premises of which this work moves.

The analysis of infrastructure alone, however, is not sufficient. Second theoretical aspects that this work deal with regards the notions of mobility, accessibility, proximity, and the multiple facet of mobility demands.

In fact, it is well known that infrastructures are only one part of the "mobility system" that also includes policies and mobility demand, which can be read at different scales. Specifically, the study of mobility demand has played a too often neglected role that claim for more attention. As pointed out (Coppola et al 2022) a paradigm shift from the provision of infrastructure services toward a broader conception of *mobility* is thus outlined overcoming the material dimension of infrastructure toward multiple intersecting dimensions. This calls for multiple expertise and analysis approaches that are not only technical. Although, at least in Italy, such technical debate has often monopolized the possible public discourse on mobility (Marsden and Reardon 2017). Mobility is - also and especially for the disciplinary location of this work - a matter of meanings, symbols, and cultures of mobility, elements that can hardly be understood exclusively within technical metrics.

While today this awareness has grown also because previously less considered actors, scales and tools are now converging within the public and scientific discourse around sustainable mobility, a crucial role in affirming this paradigm shift rely on the establishment of the literature on the new mobility paradigm (Sheller and Urry 2006). Urry (2007) not only highlights the centrality of the concept of mobility with respect to transportation and infrastructure but also highlights its crucial role with respect to social and human relations. Mobile practices and networks are culturally assembled in producing and performing the urban and the territory (Jensen 2020) from the macro esting lenses for reading the triangulation between mobility, infrastructure and territorial transformation in place.

In line with Urry's claim (2007) about a *new mobility paradigm* not only as content innovation in the study of mobility in the Social Sciences, but as transformative of the Social Sciences *tout court*, its disciplinary methodologies and ontologies.

With this perspective, transport can be thus conceived as an individual, collective, private, fast, slow tool that allow to practice a mobility strategy. Mobility strategies allow to access and to reach opportunities. Mobility infrastructure and mobility itself are thus configured as possibilities of access to and exclusion from citizenship rights: these are indispensable conditions of access to goods and services, a key factor of social and territorial integration (Colleoni 2009) but at the same time a vector and way of reproducing inequalities.

In this sense, from many perspectives literature largely investigated the broad notion of accessibility (Kenyon et al 2002; Geurs and van Wee 2004; van Wee 2022; Levine 2020). It has been defined as an "umbrella term" living among multiple sector and disciplines. It can be read as economic accessibility, social and spatial but also as a relation, a property, or a capacity.

First, accessibility refers to the possibility/ability of individuals and social groups to reach activities important to everyday life and to well-being and enjoy the opportunities such as services, goods, activities, encounters that enable actors to meet not only the elementary needs but also the more complex needs associated with identity, relationship and participation needs present in the city (Dijst and Kwan 2005).

Moreover, accessibility can be read as the relation between the individual characteristic, environmental and of the transportation system, more in detail between (1) the needs, desires of each person considered as part of a society and (2) the infrastructure, the supply of services, and (3) the presence of opportunities.

Accessibility is thus a slippery concept that face specific issues of definition and measurability. It can be considered as a social indicator, a condition necessary but not enough to improve the well-being and quality of life, social inclusion, and social justice (Cfr. Cap. 2). Operatively, accessibility can thus be considered as the territorial dimension that helps us measure and visualise the levels of inclusiveness or social exclusion present within our cities. Lastly, proximity is a concept that nowadays gained a momentum and plays a crucial role in the definition of livability and as a way itself of reaching opportunities. This concept completes the frame since proximity can be considered as a mobility strategy, a way that people own to access opportunities and goods spatially distributed. Improving accessibility in term of proximity can improve social inclusion and equality and more in general the quality of life (Nuvolati 2018).

The mentioned elements lead the long-term debate in mobility and accessibility studies (Martens 2016 ; Pucci and Vecchio 2019) towards the definition of basic needs and the opportunities that needs to be reach by proximity, how to define the group of services fundamental and foundational that are in a defined catchment area for which several tools have been implemented such as the flower of proximity (Solà 2019) and so on.

Lastly, if on one hand this work want to point out the interest regard destinies of areas in deep transformation starting from the possible patterns of movement, the analysis of railway vector, of mobile practices and possibilities that cross *intermediate areas* are in continuity with an underlying question about the universal right of movement that intersect with «mobility justice» perspective (Sheller 2018), highlighting processes of (im)mobilities (Lanza 2022) and their influences on *intermediate areas* and medium size cities futures in a context of global flows.

Two first highlighted dimension are functional in introducing the *main character* of the theoretical review that is the territory. Indeed, infrastructural dimension build materially the different territorial landscape and the mobility aspects describe the dynamics that happen in place and the reproduction of practices of a living place.

Following paragraph introduce some critical aspect about the conceptualization around *territory* that this work deal with aimed at discussed the importance of focusing on the *intermediate in – between areas* as object of the research.

First, in the European context, it becomes clear how the territory is configured as a «historical product», a palimpsest (Corboz, 1985) that can never be reduced to a single unit, but it is crossed and nourished by underlying dynamics, described by more or less visible «monuments» that are witness of a geography of centrality and marginality, shaped by time and history.

Territorial transformations are thus produced historically and can be read also in terms of different degrees of concentration of power to organize material, intangible and symbolic functions. In other words, the different structure of centralities and peripheries can be considered as the long - term result of the localization of settlement, functions and services.

These preliminary considerations introduce the first point. Investigating the territorial transformations can mean to look at these in terms of shifting centers of power and hierarchies at different scalar levels. Within this thematic area, discourses around the polarization of power, services, and gaze converge with the outcome of potential territorial inequalities.

Second point is concerned with the fact that administrative and geographical boundaries and classifications themselves are subject to the historicities of the ages and they are sometimes no longer

current descriptors of the phenomena in terms of settled and mobile practices, the opportunities of organizing relevant territorial data and, lastly, regarding the application of local and mobility policies.

In both mentioned points mobility issues have a crucial role, first because reaching opportunities and services is overall and still a matter of potential and effective accessibility and mobility. Secondly because mobility flows, supported by the materiality of infrastructure, allow different geographies of practices that redesign the complex relationship between map, settlement, belongings, and administrative competences. In this sense this relation takes in consideration the renegotiation of interpretive and organizational categories of territorial space.

Concerning theoretical attempts of the research, mentioned aspects can be considered also in other way. Indeed, looking closer to North Italy context, the macro area of the research, in light of the reorganization of the economic structures, such as the progressive loss of entrenchment and importance of big industrial players that had shaped and made strong the triangle of historical industrial production, it is possible to empathize a passage from the historical industrial triangle in North West, towards the shaping of a net of intense relationship between Milan, Venice and Bologna (and the several intermediate stops: Brescia, Verona, Padova and so on), a potential emerging triangle that deals with new forms of urbanization that from Milano goes towards the North East, substantiated by a functional network constituted by axes of road mobility (Highway A4 and Via Emilia), and of rail mobility (High Speed line) and innervated by territorial development, entrepreneurial and infrastructural *diffusive*, although not free from many risks of spatial hierarchization (Fabian and Pellegrini, eds, 2012).

Likewise, the deep morphological change *of the city* can be read in all these sensitive layers. The urban and territorial continuums led to a blurring of the boundaries of the city, which overcome those defined by the administrations; this has a political impact in the definition of integrated policies between functionally (and humanly) connected territories.
This process regard simultaneously the different spatial scales interviewing perspectives, destinies, and relations of the local. Indeed, within this process, internationally, little and midsize cities and towns risks to progressively leave the discourse and representations about *the city*. Reasons behind are several, one of these can be reach in the *morphological* transformation that tend to include them in "urban continuums" caused by the dispersion of residential and productive settlements in the current phase of economic development in the processes of sub and peri - urbanization.

As briefly mentioned, starting from these discussions, this work deal specifically with *intermediate areas*. Indeed, small and mid- size cities are not alone in the "cone of shadow" of metropolitan region, of the *whole* process of urbanization, of the representation of the *city* and, scientifically, of Urban Studies. Indeed, these can be understood in the broader scenario of *intermediate areas.* This last part of the paragraph argues about these aspects.

Intermediate areas are located into global transformation dynamics such as urban densification, regionalization, metropolitan and global city regions (Scott 2001) and planetary urbanization (Balducci et al, 2016; Soja, 2000; Brenner, 2014 Brenner and Schmid 2015). This stream of literature has its foundation in the specificities of the US, nevertheless in the last decades these studies - that had an influential role in the worldwide Urban Studies – had recent interpretations in the Italian scientific environment (Balducci, Fedeli, Curci 2017). History of studies mentioned come from far away also in the Italian context, indeed, a long-term literature (Perulli 2012; Garavaglia 2012; Garavaglia 2017 Bagnasco 1990; Turri 2000) framed intermediate areas of North West Italy as part of the same *global city region* (Sassen 2010; Scott 2008) or *metropolitan region* (Gottman 1957) the one of North Italy.

Following these aspects, it is interesting for the first dimension of the work to look at how these mentioned processes happen in place and, if that is the case, which kind of dynamics are articulated between the urban area of Milan, the more «global city», and the relative region, asking if the relation can be assumed in terms of integration or hierarchization of the space (Fabian and Pellegrini, eds, 2012) and which role mobility infrastructure and relative transformation have in towing on either side. In this sense, it is my interest to focus on the way in which the so called "periphery" of global city - is articulated and how polycentric relationship within global city region are written.

Nevertheless, literature discussed what we could call the "metropolitan US based model" just delineated, since the European *story* of the urban is deeply different. In the European context this *tout court* questioning of the "boundaries"[1] of the urban highlighted instead how this approach obscured the role that first *intermediate areas* play in defining the metrics of the urban and have historically played in urbanization processes.

This difficulty and slipperiness in describing intermediate areas and ascribing them to specific spatial categories to represent them may be one of the reasons why they have remained in a shadow cone for

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[1] the term boundaries here is used in a generic way.

urban studies. *Intermediate areas* can be understood as comprising areas forgotten and neglected by planners and policy makers. 'Planners, designers and administrators often lack a sufficient insight into what goes on in areas that cannot be pinned down in conventional categories.

As Wandl and collegues argue (2014) the many names given to the form of spatial development in *intermediate areas* (also mentioned as *territories-in-between*) reflect its pervasiveness across Europe as well as the context in which it is discussed. Focusing briefly, in that frame converge a complex scenario both out of the direct orbit of metropolitan areas and both out the notion of «inner areas». If literature largely emphasizes metropolitan areas and recently a new interest in inner areas (De Rossi 2018) became evident, areas that can't be ascribed in neither these models are barely at the center of scientific inquiry of Urban Studies.

In other words, in the European context to dethatch a clear distinction between the "urban" and the "rural" can be challenging. Much of the territory is, indeed, neither distinctly urban or rural but something 'in the middle' or 'in-between'. This scenario, that is at the center of the attention of this work, *have specific spatial and programmatic features that do not fit the classic urban–rural dichotomy* (Garreau 1991; Sieverts and Bölling 2004; Viganò 2001) and they can't be read as "simply places of intensification of urban functions in the rural environment or places of interaction of urban and rural territories". In sum, this complexity of definitions arises from the fact that much of Europe's physical territory does not fit the classic "urban-rural" although "established typologies of territory or spatial development continue to employ only degrees of urban or rural."
Otherwise-and crucially-the notion of intermediate and intermediate areas includes territories not as gradients of urban and rural, but as distinct and highly interconnected regions (Wandl et al 2014).

Within the notion of "*intermediate* areas" many different territorial definitions are considered. There are for sure medium-small towns, that largely constitute the Italian urbanization landscape, but not only. In a broader perspective, within the *Intermediate Italy* notion, indeed, can be read, as well peri-urban and suburban areas, the so called Città Diffusa (Secchi, 1991), the rurban, urban fringes, but also the history of industrial districts. The several terms used in literature to describe *in – between* or *intermediate areas* convey slightly different meanings and approaches (Wandl et al 2014).

All these territorial forms have only rarely been considered an object of investigation *as a whole* through a common prism for the analysis. As part of a broader framework that crosses boundaries, this research fits into this research stream/debate, proposing to shed the light on an often-

underestimated topic. This has the consequence in the spatial planning and territorial development since the difficult to understand them with own metrics instead as proxy and degrees of the rural and urban dichotomy. These *"mainstream"* classifications, moreover, consider mostly as definitive criterion the resident population density that is not enough in reading processes and characteristics of the *intermediate/ in-between areas.*

Nevertheless, *intermediate and in – between areas* recently gained some interest from scholars. Indeed, literature (Lanzani et al 2021; Lanzani, 2020; Viesti 2021) highlight how in specific context such as North- West or Central Italy new challenges are emerging for example in relation to demographic contraction risks, territorial fragmentation, and marginalization. These theoretical objects will be investigated deeper later in the work (CFR Chapter 5), here it is enough to take in consideration a notion of "territorial fragility" as multidimensional where demographic, socio economic, environmental, related to mobility conditions and territorial social configuration dynamics converge (Lanzani, 2020). The complexity of this concept given by the interaction of many layers is the reason why *territorial fragility* doesn't regard only that historical context of crisis such as inner and mountain areas, but here it is highlighted how these phenomena involve as well places and territories such as the so called «Italian province» that in the past decades has known meaningful development paths.

In relation to the notion of marginality, the concept of territorial inequalities is considered. This starts from the capabilities approach (Sen 1999) and considers the capacity or inability of a place/territory to allow the same exercise of citizenship rights, which means access to public services, the possibility to move around, but also to attend schools and access health care.

1.3 AIMS, RESEARCH QUESTIONS AND HYPOTHESIS

Given the tri – dimensional structure of the research, this paragraph submits to the reader the starting hypothesis and synthetizes aims, research questions related to the three dimensions proposed.

This work in located within the debate that emerge around the assumption that railway transformation, besides being deeply intertwined with the process of territorial transformation, can play a crucial role

in the recentralization process of "middle poles" and "in – between poles", nowadays, fostering potentially processes of marginalization and territorial shrinkage as in the case of Northwest Italy.

The research hypothesis could be formulated in the terms that the absence and the failure of railway supply and public transport are configured as one of the elements that contribute to the "making territories more fragile" and subject to social and territorial inequalities. In this sense, looking at the mobility practices of people that live in intermediate areas can be considered as a promising perspective in investigating intermediate areas itself, since the conceptualization itself of territories nowadays cross crucially the different nodal possibilities of places and the multiple meanings of attractiveness.

Albeit the limits of this work will not answer completely to this issue given the relevance and the weight, the starting and inspiring question of this work has been summarized in the following terms:

"Railway infrastructure transformation can be considered as an agent in the marginalization process in intermediate areas of Northwest Italy?"

In this attempt, the **main aim of the research** can be summarized in providing the analysis of the territorial transformations, in terms of urbanization dynamics, social morphologies and practices, material and immaterial relations, including potential processes of territorial hierarchization, fragmentation and marginalization in the specific context – and through the lenses of – "intermediate areas".

As seen, the process of territorial transformation is related to the transformation of the infrastructural layer, reason why the second aim of the research rely in the analysis of the railway sector, whose technical-performance specificities shape crucially the territory, in addition to the recent paradigmatical change that directly focus on the processes investigated.

Furthermore, these first two aims converge in the analysis of the micro scale of mobility patterns and practices by train of inhabitants, commuters, and travelers, that claim for an interpretation of accessibility from the *intermediate* scale.

To sum up, the several aims and research questions presented later in the script revolve around the knot of significance, symbols and cultures of (railway) mobilities in the context of intermediate areas and how those support accessibility to service, participation, engaging in activities and (self)representation practices of the spaces where people live and move. At the same time, this allows us to look at the related risks of exclusion, marginalization, and social and territorial inequality. In this sense, research questions start from the ones more general about territorial connections and

disconnection related to infrastructuring processes on railway field. In line with the theoretical framework, this work aims to detach new territorial challenges (Lanzani et al, 2021; Lanzani, 2020), and if -and in which measure- important reconfigurations of railway mobility, under the double form of infrastructure and practices, had supported those processes.

To better conceptualize and discuss this assumption the research is built on three deeply interrelated axes that sustain the main objects, aims and research questions.
More specifically, dimensions, deeply interrelated, around which research questions move are three and they can be summarized on 1. Analysis of intermediate areas in the territorial transformation, 2. Portrait of mobility infrastructure through the railway case and 3. Mobility practices and flows in *intermediate areas*, considering especially the mobile tactics and strategies in contexts and infrastructural transformations.

AIM 1/ FRAMING *INTERMEDIATE AREAS* IN ITALY

In line with previous examples (Wandl et al 2014; Colleoni and Caiello 2013, Uval 2014), this work aims to a better understanding of *intermediate areas* by proposing methods for their description and mapping looking for a common definition that reflects distinctive characteristics across the great variety of spatial development contexts in Europe.

Within a perspective that highlights its discontinuities and continuities with the recent past in terms of urban vocations and functions, the first axis aims to frame the variables underlying territorial transformation that determine the material and immaterial mechanisms that regulate and shape daily life.

As previously delineated, the aim of this works focuses on territorial transformation process and how it is mediate through ongoing the processes in the so-called *intermediate areas* with specific insights from the Italian context.

In achieving this, it is primarily essential to answer to the questions behind "intermediate areas" meanings, describing historical processes, territorial morphologies, and their specific extent on urbanization processes.

Furthermore, a common definition and conceptualization of *intermediate areas* – comprehensive of different scenarios such as the mentioned midsize and small town, urban fringes, provinces, suburban and periurban - is still a work in progress in the international debate and this work can be a way for testing and challenging its specificity from an explicit empirical analysis.

In completing this, the work will explore the dynamics (social, demographic, economic, cultural and political) the characterize them, investigating in social change perspective (CFR chapter 5)

AIM 1/ FRAMING *INTERMEDIATE AREAS* IN ITALY

a) DEFINITORY ASPECTS

i.i) To provide insight about territorial transformation in Italy through the lenses of so called "intermediate areas."

i.ii) To provide an epistemological, analytical and descriptive framework of the so-called "intermediate areas" in Italy.

i.iii). To discuss the potentiality of "intermediate areas" concept, among other conceptualization i.e. periurban and suburban areas but also midsize and small towns, provinces, rural-urban fringes, and so forth

i.iv) To provide an operational definition of intermediate areas in Italy.

b) PROCESSUAL ASPECTS

i.v) To provide a detailed framework regarding the (i) socio-demographic, (ii) economic and production, (iii) political-administrative, (iv) cultural dynamics taking place in "intermediate areas" in Italy.

i.vi) To provide a detailed picture of the state of polycentrism and processes of hierarchisation and marginalization in the Italian context and specifically in the case study.

RESEARCH QUESTIONS/ AIM 1/ FRAMING *INTERMEDIATE AREAS* IN ITALY

a) DEFINITORY ASPECTS

i.i) How do intermediate areas mediate the process of territorial transformation in Italy?

i.ii) How can be conceptually defined intermediate areas in Italy today?

i.ii) How are intermediate areas defined and perceived by those who live there?

i.iii) How does the concept of intermediate areas relate to other related definitions such as midsize and small towns, provinces, rural-urban fringes but also periurban and suburban areas?

i.iv) Which dimensions and indicators are relevant to operationalize and to map intermediate areas in Italy?

i.iv) Which indicators and literature are useful to select a relevant case study accordingly?

i.v) What social, economic, environmental and cultural variables/dynamics mediate the ongoing territorial transformation in intermediate areas in Italy?

i.v) What is the socio-economic, demographic, environmental, administrative and cultural landscape in the intermediate areas today?

i.vi) How processes of polycentrism, hierarchization and marginalization act today in intermediate areas of Italy?

i.vi) Given a definition of spatial marginalization can we identify such dynamics in intermediate areas?

AIM 2 / INFRASTRUCTURAL ANALYSIS AND THE RAILWAY CASE / THE ROLE OF RAILWAY INFRASTRUCTURE IN THE TERRITORIAL

Given the general interest on the relation between infrastructure and territories and how the territorial transformation process is intervened with the infrastructural transformation, the specific aim is placed in the knot between the territorial transformation of intermediate areas (AIM 1) and the mobility infrastructural one examining the railway case. This aim can be pursued investigating the deep and multidimensional (managerial, strategical and cultural) transformation of the railway itself occurred in last decades, in this sense, the research aims to investigate how this transformation has been perceived and lived internally and externally both by users, travelers and workers of the railway.

To the progressive modernization of lines and acceleration of metropolitan interconnection system, mostly due to the impulse of High-Speed launch, is juxtaposed to the stasis of local lines (more) slow and with (lower) performances, although not always syntezable in deterioration *tout court* of local transport system. What it is interesting to focus on is if and how this hiatus is configured in terms both in terms of "externalities" for the middle towns that remain excluded from High Speed. Secondly it is crucial to accompany this issue with a focus on perceptions and representations from users, travelers, and inhabitants in intermediate areas out from higher metropolitan flows.

At the same time, as previously highlighted, here it is investigated the role of exchange traditionally covered by middle town, especially ones placed in strategic areas (i.e Alessandria, Voghera, Tortona...), in terms of hub of the network, due to the development of High-Speed regimes that shift this role directly on metropolitan stops.

In this sense, this work aims to investigate the relationship between infrastructural material level and symbolic and cultural one, related to use, presence, performance, and reliability of lines. Between

socio economic and meanings around where to live and the territorial (self)representation, how this is declined in terms of (im)mobility? Immobility, stacity that if traditionally could reassure, on the other hand nowadays represent a risk factor about the processes of removal and abandonment of more young generation that can't find a fertile soil where grow up their expectations.

AIM 2 / INFRASTRUCTURAL ANALYSIS AND THE RAILWAY CASE / THE ROLE OF RAILWAY INFRASTRUCTURE IN THE TERRITORIAL

ii.i) To analyze the specific role of mobility infrastructures in the territorial transformation of intermediate areas on a material and symbolic - cultural level.)

ii.ii) To analyze the territorial transformation from the point of view of the transformation of the railway actor in strategic, managerial and operational terms.

ii.iii) To analyze how the transformation of the railway actor has redefined the infrastructure network in practice in the case study of the intermediate areas (and specifically in the case study)

ii.iv) To provide some exploratory analysis of the transformation of the social role of railway infrastructure

RESEARCH QUESTION 2 / INFRASTRUCTURAL ANALYSIS AND THE RAILWAY CASE

ii.i) How has the railway sector changed in Italy? In what terms has the infrastructural transformation of the railways in Italy taken place?

ii.ii) How has the railway infrastructure transformation taken place in the context of intermediate areas?

ii.iii) How can railway infrastructure contribute towards sustainable transition in intermediate areas?

ii.iii) How was the infrastructural transformation of the railway perceived internally (workers and former workers)?

ii.iv) How was the infrastructural transformation perceived by users and travelers?

ii.vi) How have the transformative dynamics analyzed impacted the rail infrastructure and which changes have they generated in its role as a means of transportation and as a symbolic referent of spatial transformation, especially in intermediate areas?

Third and main aim of the research is focused on the analysis of the mobility demand of people that live, commute and travel in *intermediate Italy*. The selected gaze considered is the analysis of the micro scale of mobility patterns and practices by train. In line with the previous aims these are the result of the dynamic interaction between territorial and infrastructural transformation.

Furthermore, this aim is related to accessibility of *intermediate areas* and how potential processes of socio territorial disconnection, marginalization and fragilization result from the mobility infrastructure aspects. The "micro scale" allows to consider accessibility as a complex object where spatio - temporal distances have an important but not exclusive role in its measurement that involve the symbolic and cultural dimensions.

In other words, third aim is focused in analyzing in the changes in mobility demand accessibility practices and patterns (also diachronically) supported by the changing rail system to understand how the infrastructural changes in service supply have impacted the ability and patterns of realized mobility of inhabitants, both material (actual ability to get from a to b) and immaterial (ability to think of oneself as mobile in space.

This point opens to the **third dimension** that seeks to investigate practices of mobility, perceptions and representations related to the possibilities of movement within the context. Which dynamics, reasons and processes substantiate commuting practices from, towards and across "intermediate areas"?

As mentioned, research questions deepen significance, symbols, and cultures of railway mobilities in the context of intermediate areas and how those support (self)representation practices of the spaces where people live and move. In relation with the first dimension, the aim is thus to read the presence of territorial marginalization not only through technical lenses of "local development", indeed, several meanings are possible around urban living, attractiveness and livability in a context of strong global urbanization material and narrative. If *everything* is urban, this work lateral wants to explore multiple meanings that sustain the *urban* in the "in – between" experience. In this sense, mobility is a crucial vector of analysis both for the measures of accessibility among places, amenities and services but also regarding the possibility and the capacity to self-reflection as mobile in the space. Therefore, this research aims to investigate imaginaries related to *live in the middle* with regards to the paradigm of *urban centrality* (De Rossi – Barbera, 2021; Clemente, 2018) in material and

symbolical terms, looking at it through the different possibilities, willingness and necessities of movement and commuting.

In relation with the second axe about infrastructural transformations, it is crucial to consider meanings of crisis and emergences where political, symbolic and cultural aspects of infrastructure become evident through lacks and breaks. In this sense Northwest Italian context has known important issues in recent years, that brought a complete reshaping of experiences of mobility patterns.

Lastly, since this work wants to point out the interest regard destinies of areas in deep transformation starting from the possible patterns of movement, from the analysis of railway vector and of mobile practices that cross intermediate areas, all these issues are in continuity with an underlying question about the universal right of movement. This intersects with «mobility justice» perspective (Sheller 2018), highlighting processes of (im)mobilities and their influences on *intermediate areas* futures and, on the other hand, the risks of *transit boosterism* (Olsson and Thomas 2024). This latter aspect regards the potential «mobility regime signified by an uneven provision of public transit, with certain areas accessible to very high-quality public transit and others with unchanged or decreased transit services» (ibidem p. 2) that reclaim the question regard whose and for whom are the infrastructure. Moreover, the interest in the notion of mobility justice, as will be deeply argued in the theoretical chapter, rely in the capacity to put different concerns (from the climate justice, resource extraction, military mobilities and global logistic chains, racial segregation, homelessness, mass imprisonment, disable and elderly people, the normative sexual policing) into a single and multivocal conversation, and to reflect through a *common prism*, showing how they not only intersect but refract and intensify each other in multiple directions at once.

To sum up, third dimension concerns more explicitly the practices of mobility in terms of reproduction of social relations reflecting as well how the infrastructural changes in service supply have impacted the ability and patterns of realized mobility of inhabitants, both material (actual ability to get from a to b) and immaterial (ability to think of oneself as mobile in space). Mobilities are thus conceivable as a constellation of embodied movement, meaning and practices (Cresswell 2006). This axe claims the need to overcome an analysis of change (territorial, infrastructural and about mobility) anchored on individual choices, technical transformation and according to the effect of economic forces.

This allows to approach the study of mobility with the correspondence of "uneven" mobility and mobility "injustice". Sheller (2020 p. 18) argues the need for a "twin transition towards

environmentally sustainable mobility and mobility justice" in the following terms: "debates over sustainable urbanism, transport justice and urban accessibility must also be placed in the context of wider transnational mobility regimes, including borders, refuge and migration". In this sense, "low-carbon transitions away from the dominant system of automobility are just one of the issues driving mobilities research" and mobilities research helps us to see the wider systems of (im)mobilities in which transportation is situated".

AIM 3 / MOBILITY DEMANDS, PRACTICES AND FLOWS IN *INTERMEDIATE AREAS*

iii) Analyzing how the relationship between territorial and infrastructural transformation happens in mobility practice.

iii.ii) Analysis and discussion of railway accessibility in *intermediate areas* as potential vector of new forms of inequalities

iii.iv) Analysis and discussions of mobility strategies and tactics of travelers and commuters in fronts of multiple transformations.

RESEARCH QUESTIONS – AIM 3

iii.i) How does the relationship between territorial and infrastructural transformation happen in the practice of mobility?

iii.ii) How people that live and cross intermediate areas move? Specifically, how can the demand, in terms of desires and needs, for mobility in intermediate areas in Italy be summarized?

iii.ii) What are the main mobility challenges in the intermediate areas? how these processes potentially created new forms of inequalities?

iii.ii) How the notion of accessibility can be read in the context of intermediate areas?

iii.iii) What are people representations and expectations related to mobility and related infrastructure?

iii.iii) What are people answers in terms of mobile practices and representation to the transformations of infrastructures, services and territories?

AIM 1/ FRAMING *INTERMEDIATE AREAS* IN ITALY

a) DEFINITORY ASPECTS

i.i) To provide insights about territorial transformation in Italy through the lenses of so called "intermediate areas."

Chapter 3 frame the notion of territory and territorial transformation.
Chapter 3.3 explore the territorial diversity in Italy.
Chapter 3.4 analyzes how literature framed "intermediate areas as the subject and object of territorial transformation" in terms of classifications and ongoing dynamics.
Chapter 5.2 provides an original taxonomy of the Italian territory highlighting the importance of intermediate areas.
Chapter 5.3 analyzes the intermediate areas of northwest Italy multidimensional dynamics.
Chapter 7 ….

Q. I.I) HOW DO INTERMEDIATE AREAS MEDIATE THE PROCESS OF TERRITORIAL TRANSFORMATION IN ITALY?

i.ii) To provide an epistemological, analytical and descriptive framework of the so-called "intermediate areas" in Italy.

Q. i.ii) HOW CAN BE CONCEPTUALLY DEFINED INTERMEDIATE AREAS IN ITALY TODAY?

A. Chapter 3.4 focuses on these aspects

Q i.ii) HOW ARE INTERMEDIATE AREAS DEFINED AND PERCEIVED BY THOSE WHO LIVE THERE?

A. Chapter 7 focuses on these aspects

i.iii) To discuss the potentiality of "intermediate areas" concept, among another conceptualization

Q. HOW DOES THE CONCEPT OF INTERMEDIATE AREAS RELATE TO OTHER RELATED DEFINITIONS?

A. Chapter 3.4.1 focuses on these aspects

AIM 1/ FRAMING *INTERMEDIATE AREAS* IN ITALY

i.iv) To provide an operational definition of intermediate areas in Italy.

Q. I.IV) WHICH DIMENSIONS AND INDICATORS ARE RELEVANT TO OPERATIONALIZE AND TO MAP INTERMEDIATE AREAS IN ITALY? AND IN THE MACRO AREA OF THE CASE STUDY?

A. **Chapter 5.1** focuses on these aspects

Q. I.IV) WHICH INDICATORS AND LITERATURE ARE USEFUL TO SELECT A RELEVANT CASE STUDY ACCORDINGLY?

A. **Chapter 4** and **5** focus on these aspects

b) PROCESSUAL ASPECTS

i.v) To provide a detailed framework regarding the multiple dynamics taking place in "intermediate areas" in Italy.

Q V) WHAT SOCIAL, ECONOMIC, ENVIRONMENTAL, AND CULTURAL VARIABLES/DYNAMICS MEDIATE THE ONGOING TERRITORIAL TRANSFORMATION IN INTERMEDIATE AREAS IN ITALY? AND IN THE CASE STUDY AREA?

Q V) WHAT IS THE SOCIO-ECONOMIC, DEMOGRAPHIC, ENVIRONMENTAL, ADMINISTRATIVE AND CULTURAL LANDSCAPE IN THE INTERMEDIATE AREAS TODAY?

Chapter 3.5 for the literary portrait
Chapter 5.2 For the author analysis

Q GIVEN A DEFINITION OF SPATIAL MARGINALIZATION CAN WE IDENTIFY SUCH DYNAMICS IN INTERMEDIATE AREAS? AND IN INTERMEDIATE AREAS OF THE CASE STUDY?

Chapter 3.5 for the literary portrait
Chapter 5.2 for the author analysis

i.vi) To provide a detailed picture of the state of polycentrism and processes of hierarchization and marginalization in the Italian context and specifically in the case study.

I.VI) HOW PROCESSES OF POLYCENTRISM, HIERARCHIZATION AND MARGINALIZATION ACT TODAY IN INTERMEDIATE AREAS OF ITALY?

Chapter 5.4 give some insights

AIM 2 THE INFRASTRUCTURAL ANALYSIS AND THE RAILWAY CASE

ii.i) To analyze the specific role of mobility infrastructures in the territorial transformation of intermediate areas on a material and symbolic - cultural level.)

A. **Chapter 2.1** frames the notion of infrastructure in its multiple definitions
Chapter 2.2 explores the theoretical specificities of mobility infrastructure in the territorial transformation
Chapter 6 explores these aspects in historical terms looking at railway case
Chapter 7.2/3 explores these aspects from the perspective of users and workers

Q. II.I) HOW DO (MOBILITY) INFRASTRUCTURE MEDIATE THE TERRITORIAL TRANSFORMATION?

ii.ii) To analyze the territorial transformation from the point of view of the transformation of the railway actor in strategic, managerial and operational terms

Q. II.I) HOW HAS THE RAILWAY SECTOR CHANGED IN ITALY? IN WHAT TERMS HAS THE INFRASTRUCTURAL TRANSFORMATION OF THE RAILWAYS IN ITALY TAKEN PLACE?

A. **Chapter 6** focuses on these aspects

Q. ii.ii) HOW HAS THE RAILWAY INFRASTRUCTURE TRANSFORMATION TAKEN PLACE IN THE CONTEXT OF INTERMEDIATE AREAS?

A. **Chapter 6.3** focuses on these aspects

ii.iii) To analyze how the transformation of the railway actor has redefined the infrastructure network in practice in the case study of the intermediate areas (and specifically in the case study).

Q. II.III) HOW CAN RAILWAY INFRASTRUCTURE CONTRIBUTE TOWARDS SUSTAINABLE TRANSITION IN INTERMEDIATE AREAS?

A. **Chapter 6.6.2** focuses on these aspects

Q. II.III) HOW WAS THE INFRASTRUCTURAL TRANSFORMATION OF THE RAILWAY PERCEIVED INTERNALLY (WORKERS AND FORMER WORKERS)?

A. **Chapter 7.3** focuses on these aspects

Q. II.III) HOW WAS THE INFRASTRUCTURAL TRANSFORMATION PERCEIVED BY USERS AND TRAVELERS?

A. **Chapter 7.2** focuses on these aspects

ii.iv) To provide some exploratory analysis of the transformation of the social role of railway infrastructure

Q. II.IV) HOW HAVE THE TRANSFORMATIVE DYNAMICS ANALYZED IMPACTED THE RAIL INFRASTRUCTURE AND WHICH CHANGES HAVE THEY GENERATED IN ITS ROLE AS A MEANS OF TRANSPORTATION AND AS A SYMBOLIC REFERENT OF SPATIAL TRANSFORMATION, ESPECIALLY IN INTERMEDIATE AREAS?

A. **Chapter 7** focuses on these aspects

AIM 3 / MOBILITY DEMANDS, PRACTICES AND FLOWS IN
INTERMEDIATE AREAS

iii.i) Analyzing how the relationship between territorial and infrastructural transformation happens in mobility practice.

Q. HOW DOES THE RELATIONSHIP BETWEEN TERRITORIAL AND INFRASTRUCTURAL TRANSFORMATION HAPPEN IN THE PRACTICE OF MOBILITY?

A. **Chapter 2.2** frame the theoretical problem

Q. HOW PEOPLE THAT LIVE AND CROSS INTERMEDIATE AREAS MOVE? SPECIFICALLY, HOW CAN THE DEMAND, IN TERMS OF DESIRES AND NEEDS, FOR MOBILITY IN INTERMEDIATE AREAS IN ITALY BE SUMMARIZED?

A. **Chapter 3.6** give a literary portrait of the processes
Chapter 5.2.2 analyses mobility and accessibility dynamics in intermediate areas of NW
Chapter 7 focuses on perceptions and representations

Q. WHAT ARE THE MAIN MOBILITY CHALLENGES IN THE INTERMEDIATE AREAS? HOW THESE PROCESSES POTENTIALLY CREATED NEW FORMS OF INEQUALITIES?

iii.ii) Analysis and discussion of accessibility and mobility ongoing processes in intermediate areas with reference to the risks of new forms of inequalities

A. **Chapter 3.6** Clarify theoretical aspects
Chapter 5.4 Summarize these aspects from the indicators analysis
Chapter 6.3 Analysis these aspects in relation to the railway change in intermediate areas
Chapter 7 propose the voices of travelers and users

Q. HOW THE NOTION OF ACCESSIBILITY CAN BE READ IN THE CONTEXT OF INTERMEDIATE AREAS?

A. **Chapter 3.6** Clarify theoretical aspects

AIM 3 / MOBILITY DEMANDS, PRACTICES AND FLOWS IN

INTERMEDIATE AREAS

iii.iii) Analysis and discussions of mobility strategies and tactics of travelers and commuters in fronts of multiple transformations.

Q. WHAT ARE PEOPLE REPRESENTATIONS AND EXPECTATIONS RELATED TO MOBILITY AND RELATED INFRASTRUCTURE?

A. **Chapter 7.2**

Q. WHAT ARE PEOPLE ANSWERS IN TERMS OF MOBILE PRACTICES AND REPRESENTATION TO THE TRANSFORMATIONS OF INFRASTRUCTURES, SERVICES AND TERRITORIES?

A. **Chapter 7.2**

Q. WHAT ARE PEOPLE ANSWERS IN TERMS OF MOBILE PRACTICES AND REPRESENTATION TO THE TRANSFORMATIONS OF INFRASTRUCTURES, SERVICES AND TERRITORIES?

A. **Chapter 7.2**

Table 1: Aims & Questions & Answers. Author elaboration

1.5 RESEARCH DESIGN, METHODOLOGY AND OUTLINE

1.5.1 Premise

As previously discussed, considering mobility, mobility infrastructures and processes of territorial transformation not only as technical outcome of socio-economic matrix, but as culturally embedded phenomena, this work provides a multiple method approach that could be able to better frame complex issue from different perspectives and gazes. In this sense, mix and multi method disciplinary approach could be a promising methodological solution due to the complexity and the several semantics involved.

It is not just a matter of multiple methods, but this work recalls with "multidisciplinarity and transdisciplinarity, since topics and issues studied by the present work invoke different approaches and methodological practices that are anchored to different disciplinary traditions and vocabularies. Thus, practicing multidisciplinarity can be time spending and demanding since disciplines have sedimented theoretical and practical traditions over time, the amount and specificities of which can be difficult to harmonize.

The advantages of using many different toolboxes and disciplinary lexicons are obvious: the greater complexification allows the same phenomenon to be viewed through a more complex prism and provide different questions and interpretations. However, different disciplinary lexicons correspond to different reference dictionaries and meanings: comparing dictionaries born in different disciplinary contexts may be configured as a complicated translation operation not always feasible.

Objects such as spatial transformation, mobility, and infrastructure necessarily mobilize different disciplinary families since they have traditionally been objects simultaneously handled by planners, architects, geographers, sociologists of the territory, and urban anthropologists, as well as engineers and transportation economists. As Urry (2007) reported, new mobility paradigm is not just a content innovation in the study of mobility in Social Sciences, but it is transformative of Social Sciences at all, of its methodologies and disciplinary ontologies. As reported (Sheller 2020) mobility paradigm approach claims for "the need to move beyond the notion of mixed methods research simply involving a mixture of qualitative and quantitative methods", going "toward a notion of mobile methods which shift around according to the question at hand".

This highlights the need for considering the difficulties in building a common and shared syntax between technical studies and social sciences, to overcome the strong technical connotation that characterized studies and debate around mobility infrastructure and transport.

The challenge of territory (and mobility), as has often been pointed out in the literature, (Cognetti and Fava 2019) lies in finding a balance and a common dictionary among the different competencies that work on the same object with the aim of giving sufficient answers to the understanding of the phenomena and transformations taking place. These are answers that deconstruct the processes analytically and provide cues to re-build practices and policies with the goal of reducing socio-spatial imbalances and inequalities.

Mobility can't be considered only as a «neutral set of processes permitting forms of economic, social and political life» (Urry, 2007 p. 12), Social Sciences indeed, risk to ignore the enduring systems that provide what we might call the *infrastructures of social life.* Such systems enable the movement of people, ideas, and information from place to place, person to person, event to event, and yet their economic, political and societal implication are mostly unexamined in Social Sciences.

Starting from an integrated approach of multiple disciplines, this work nevertheless, is anchored within the study tradition of Urban and Territorial sociology and of Social Sciences interested in territorial phenomena with the relative qualitative and quantitative tools, without nevertheless overlook the gaze towards methodological practices akin to disciplines like planning.

The methodological challenge derives, as well by the multiscalarity of phenomena that "seek to apply the lessons of the mobilities paradigm by combining methods that focus on micro-level embodied practices, meso-level urban assemblages and complex macro-historical processes. Thus, mobilities research can widen the aperture to macro-level research questions, as well as zooming in on micro-level questions, and these each call for different research methods" (Sheller 2020).

1.5.2 Methodological aims and research tools

In this paragraph I introduce more specifically the methodological attempts and tools used to pursue the different aims of the research previously highlighted.

The first methodological aim relies in framing theoretically and operationally the notion of "intermediate" areas. Starting from and in continuity with previous works (Castrignanò Colleoni e Pronello 2012; Colleoni e Caiello 2013; SNAI 2014, Balducci, Fedeli, Curci, eds, 2017; Pennati et al, 2017; Garavaglia 2017; De Rossi eds. 2018 Vendemmia et al 2021), effort of this work will be dedicated on the elaboration of an updated dashboard of the indicators useful to describe territorial dynamics today and specifically to elaborate an effective classification of the so called intermediate areas. This attempt would highlight the criteria that define *intermediate territories* and how these

variables can be translated into indicators operationally useful to describe and to frame intermediate areas and to highlight the specific characteristic as interesting unit of analysis of the ongoing territorial transformation in the national context and in the particular case of Northwest Italy.

Examples of considered variables may be economic transformation (productive and labor dimensions) and social and demographic composition (who lives in those places), political-administrative variables (the transformation of the role of local government in contextual and national dynamics), but also cultural variables (see the dimension of public opinion in the "province") and how this feeds the transformation of representations and imaginaries of that city. Crucial to investigate are the "variables" of the relationship with the contiguous metropolitan centralities, such as the administrative form of metropolitan cities and provincial dimension, the medium cities and urban regions of reference and what specificities characterize continuity and discontinuity of the urbanized. One important previous in this sense is represented by the work of the *National Strategy for Inner Areas* (Uval 2014). During last ten year a renovated gaze on the classification of *inner areas* had a crucial role in the exposure of them in literature, scientific and public discourse.

With the aim of identifying peripherical areas, SNAI classification overcomes the traditional criteria that consider the distances from poles defined on a demographic basis in and it suggests a perspective that considers the spatial – temporal distances from the so called "centri di offerta dei servizi" (service centers) that define "the quality of life of citizens and their level of social inclusion" (Snai, 2014). Highlighting the role that healthcare, education and mobility historically have had in the "full exercise of citizenship rights", the relevant services identified by SNAI are the full presence of secondary school system, at least a first level hospital and a railway station (silver level). The texture of the indicators selected by SNAI for the identification of inner areas, although valid for each Italian municipalities, is nevertheless not sufficiently detailed and contextual for the analysis of the so-called "intermediate territories". This is why the interest is renewed in defining a matrix of indicators that are better suited to the context and the characteristics of intermediate areas.

To sum up, first methodological attempt focuses on (1) establishing identification criteria of the so called "intermediate areas". In addition to the relevance itself this is a 'preliminary action also necessary to defining the specific case study of the research.

In this sense, pursuing first aim of the research cartographical and geomatic tools are useful in the classification of the areas, the sample selection but also, they are useful in reading and analyzing the ongoing dynamics with the mapping of most frequent and discussed social indicators. The details

regard the process will be given in the methodological chapter. To complete the portrait regarding the classification, evaluation, and analysis of the intermediate areas in Italy a map of point of interest and basic services will be provided.

In pursuing the second methodological aim of the research focused on the analysis of the transformation of the infrastructural vector the aid of geomatic and cartographic tools will be useful in order to map and visualize the variation of the infrastructure presence, georeferenced data about the presence of railway and stations will be helpful in having a sight on the different stages of railway sector in Italy and in the case study analyzing communication and report tools from the railways companies.

Lastly, looking at the third methodological aim that focuses on mobility demand and practices different aspects needs to be considered.

At the macro level, this work provide insights regards mobility demand variation and related flows, services and supplies. This would allow a general gaze at least on the systematic mobility of the areas, concerning the work and study. related trips and the degree of self-containment.

Nevetherless, as previously discussed, to provide a complete portrait of phenomena qualitative tools (Cardano, 2011) are required. Indeed, the complex system of imagery, symbolism and cultural production connected to the possibility of movement that are mediated through mobility infrastructure led us to consider the necessity of ethnographic qualitative approaches of "being in" and "being with" (Passaro, 1997; Viazzo, 2003; Semi, 2010) or in this case to travel with (Urry, 2007), establishing relational dynamics, (observation, participant observation, interviews, ...) with the multiple actors involved in infrastructure processes and with mobile people, in other words, methodologies that can be able to listen, understand and discuss practices and cultural experiences of mobility and immobilities.

Indeed, at the material heritage corresponds to the immaterial one made of memories, stories, voices of workers, commuters, and inhabitants around and about the railway complex and territorial systems to be collected through these cognitive tools that allow to go deep into the perception of the possibilities of movement in space, on the meanings and symbology related to mobility.

Field analysis allows to center the gaze on practices and strategies (De Certeau 1980) of mobility performed by the actors, whether they are users, workers or external to the railway ecosystem. In this context, the perspective of listening and dialogue of the ethnographic discipline allows a new look

not only on formal policies and systems but also on socio-territorial needs, formal vacuums and the social reproduction of routinized actions such as practices.

In this perspective, starting from the transformative power of the new mobility paradigm, John Urry underlines the need for "new mobile rules" (Urry, 2007 p. 9) in sociological methods. Indeed, also research methods «need to be *on the move* in effect to simulate in various ways the many and interdependent forms of intermittent movement of people, images, information and objects» (Urry, 2007 p. 39).

> Researchers seeking to understand embodied experiences of uneven and differential mobilities try to imagine themselves in the shoes (or on the wheels) of their informants, to understand how they move through the world and what they experience as they do so. This has involved methods such as interviews on the move, participant observation during travel, ethnography across mobile sites and sites of mobility, and collection of records such as space-time diaries, Global Positioning System (GPS) tracks, or drawings of subjective maps and routes. These observations and ethnographic methods might involve video, sound recording, autoethnography, or some combination of all three. The questions driving these research methods are often concerned with how different individuals or groups practice movement, how they experience spaces of movement, and how they interact with and make judgements about particular assemblages of equipment, spatial affordances and infrastructure. In contrast to economic or behavioral approaches to individual mode choice in studies of transportation, these research methods create a much richer array of qualitative data. (Sheller 2020 p. 14)

Relying in multiple approaches and tools could be useful to overcome limits of each approach: from one side, the use of qualitative methods give depth on everyday making to quantitative ones, on the other side, quantitative analysis could support in orienting qualitative gaze.

From methodological point of view, moreover, starting circumstances of this research under pandemic times raised the interest in looking into more quantitative tools such as the analysis and mapping of indicators and points of interest previously presented in order to support the possible difficulties in access to the ethnographic field and in establishing direct and extended relationship with interlocutors.

Despite the initial doubts regarding the accessibility to the field, recent Covid19 pandemic has impacted only partially the feasibility of the field, and it hasn't move the research towards completely new research path. Nevertheless, the fist interest in combining different tools including the ones more quantitative to the ethnographic ones starts in this specific context and tried to answer to pandemic related challenges.

1.6 TEMPORAL AND SPATIAL CONTEXTS OF THE RESEARCH

According to the theoretical framework and the purpose of the present research, the area of Northwest of Italy has been selected as privileged observatory of the dynamics of territorial transformation with potential issues of marginalization related to mobility infrastructural projects.

This paragraph will approach and narrow gradually the area of the case study, first Northwest Italy macro area will be introduced, secondly it will be focused on the "in – between area" between Liguria, Piedmont, and Lombardy region. Lastly, a more specific and detailed case study inside this latter area will be presented in the empirical part of the research.

Northwest Italy is a broad and complex area, reasons why it has been selected as a viewpoint for the research are several and can be summarize in these three macro/general points:

a) HISTORICAL ROLE IN THE ITALIAN TERRITORIAL SYSTEM

b) THE DEEP AND COMPLEX TRANSITION OF THIS AREA

c) POTENTIAL INFRASTRUCTURAL CENTRALITY
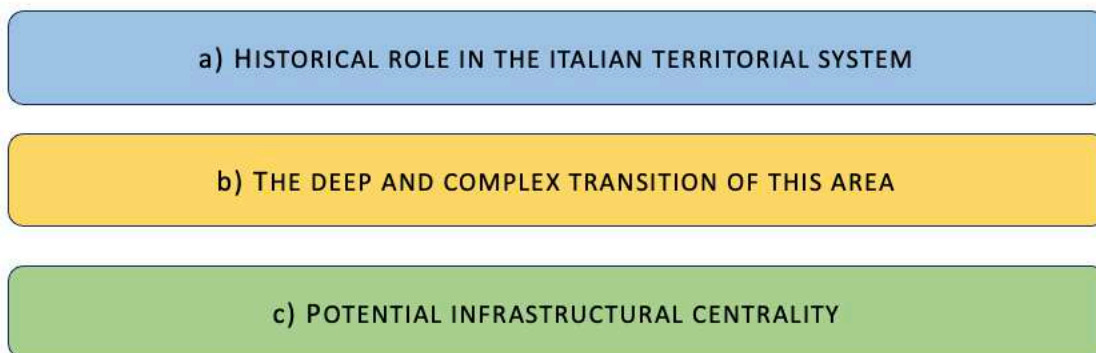
Figure 1: Three main reasons behind the choice of North West Italy as main context

Northwest Italy is an area that historically, also considering the to early industrialization processes compared to the rest of Italy, had seen the emergence of a rather dense network of railways that reflected the strongly polycentric character of the area. Nevertheless, this widespread railway network has known important changes over time. Specifically, seeing this area this infrastructural service and offer change has been relevant and worth of investigation, the main result for example has been a long-term process of suspension of the so-called dry branches, local and less profitable lines (Maggi, 2007). This process can be considered in transformative terms, highlighting the long-term transformations of the possibilities the desires, the needs, and the demand for mobility of this area. Infrastructural network changed a lot over time and railway networks as well as expectations regarding infrastructural speed.

In this sense, it is interesting to underline how at the discursive level one of the fundamental resources in terms of development, identity, and possible futures rely in the infrastructural expectation itself, built around a hypothetical "new industrial triangle".

Nevertheless, this *Industrial triangle 2.0* invoke again mostly the poles and partially the "inside", the content of the triangle from the perspective of sustainable infrastructure, such as railway. At the center of the discourse (and of the practice) there's an acceleration of the movement between Turin, Milan, and Genoa but just partially protagonist of the triangle are the territories that constitute the actual area of it.

If, in line with this specific interest on the poles of the triangle, the processes – such as the deindustrialization - have been largely investigated in literature (Pichierri 1989; Bagnasco 1990 ; Berta Pichierri 2007; Bigatti 2023) from the perspective of the cores and within a more historical – economical vocation, less has been said about the dynamics occurred and the ongoing consequences specifically inside the triangle.

In this sense, exploring this *inside* has been one of the reasons that motivate the interest in this area. The reference to the "inside" of the triangle, moreover, can be seen primarily as a narrative referent besides regarding the actual dynamics that occurred. In this sense, industrial triangle in its inside is not investigated in historical terms but as clear and relevant territorial referent from the discursive and public perspective.

The critical passage of deindustrialization, as will be argued, has marked the economic, social, political and territorial scenarios tout court in a relevant way, defining itself as a material and discursive transition that still acts in a profound way on the territory considered. This allows us to observe and helps us to understand human lives in (urban) environments that are crossing different forms of transitions, in coherence with the aims of the research.

Moreover, investigating the paths of Northwest Italy context, it is posed the interest in tracing productive and post Fordist transitions of the historic *industrial triangle*, mapping the triangulation between post manufacturing contexts, territorial downscaling and infrastructural dynamics. In this sense, mobility processes grasp the urgent challenges regarding the necessity of a transition in the role of intermediate areas, new and emerging territorial vocations, after the crisis. A productive crise that is translated in urban/territorial crisis *tout court*, this means, for example, the decrease of workforce or the difficulties in attracting and hold human capitals; the crise is, moreover, translated in environmental one: due to the long-term presence of polluting industrial sites. In this sense, here are presented the issues regarding which connections between productive areas, former ones, and territories, in terms of paradigmatic change related to mobility, in sustainable way.

Following paragraph will argue more in depth about the selection of the specific case studies, about the dynamics occurring and previous research in the context.

Following scheme (Fig. 2) synthetize the different approaches of time that the work can consider that will discuss in the methodological chapter (cfr.4.6.2).

Figure 2: Different layers of time in the research. Authors elaboration

To sum up, different layers of time can be recognizable in following pages.

First is the time of the research: the periods and times where the empirical work is placed is between 2020 and 2023. These temporal coordinates reclaimed to take in consideration issues related to pandemic that gave to the work uncertainness, especially regarding the possibility of conduction of the qualitative study and its organization.

Moreover, it is possible to assume that the *time* of the research is the contemporaneity of the current mobile practices of people. Nevertheless, biographical time of change perceived by interviewed allow to the research a long-term perspective. Indeed, contemporary is not the only perspective of the research, the dynamics here analyzed cover a time frame of at least three decades. Intertwined with the time of the field, biographies and pandemics is the time of infrastructure and its changes, which allow the research to be anchored within a transformative framework. As mentioned in the previous paragraph, railway infrastructures in the European and Italian context have undergone a remarkable transformation since the late 1990s that has changed the service landscape in a differentiated way in different scalar and geographical contexts and for different categories and types of users.

1.7 SCIENTIFIC, PRACTICAL AND SOCIAL RELEVANCE OF THE RESEARCH

Reasons behind the choice to investigate the "intermediate" scenario from the perspective of the mobility infrastructure transformations are multiple and will be summarized in the following paragraph that will present the scientific, practical and social relevance underling aims and interests of the research.

From the scientific perspective, this work aims to contribute to strengthen the knowledge and the awareness around the so called "intermediate areas" from the side of possible definition as well as looking at the territorial and mobility dynamics that occur.

Considering the interest of the research towards the railway sector, the first choice to use the notion of "intermediate" or "in-between" can be configured as a "metonymy". Indeed "intermediate" derives and refers, first, to the "intermediate stops" that are located along the railway axes. This aspect has constituted since the previous research the narrative glue as well as the first root of interest in these territories. Furthermore, this is placed in continuity with a specific stream of literature (Lanzani et al 2021) that started to deal with this issue more explicitly.

As highlighted, intermediate areas remain in a quite hidden corner within the literature on Urban Studies strongly focused in the last decades to investigate metropolitan and core areas on the one hand and inner areas more recently (De Rossi eds. 2016; Cersosimo and Donzelli 2020; Carrosio 2019; ..) in line with the Snai (National strategy for inner areas) launched in 2013, both studies on metropolitan areas and on inner areas start from a specific perspective in one or the other point of view. In this sense, considering intermediate areas within a comprehensive definition with coherence of dynamics, as well as morphology, would allow to frame their relevance and potentially re-center them in the debate about the future of these areas. In this sense, here it is argued the interesting in investigate *intermediate areas* as homogeneous although the internal deep differences to advantage them in the public and scientific territorial debate. Moreover, it is clear that the boundaries of intermediate areas that needs to be considered not as essentializing limits of the landscape but as analytical, porous and functional lenses.

Weight, history and ongoing dynamics of the areas are considered as relevant behind the choice of this research context.

First, weight. Indeed, an inclusive perspective would allow us to frame the specific weight that this scenario has at least as far as the Italian context. From a demographic point of view, from a first glance (Lanzani et al 2021) about half of the Italian population lives there and refers to roughly half

of the Italian geography, spatially speaking. This is linked to the role, already mentioned above, that these territories have played in the processes of polycentric urbanisation and long-term territorial transformation in the European and Italian context.

From a scientific point of view, also investigating intermediate areas as a whole is relevant to observe the continuous transformation of the palimpsest of territorial centralities between the *metropolitan* and the *inner* in terms of different scales of economic and power concentration but also different urban narratives and ideologies at stake.

Secondly, the role of this scenario is moreover historical, although today a great part of the literature focuses on the role that cities and global region have and have had in the global urbanization processes, not less relevant has been the *protagonism* of midsize town and industrial districts in the definition of a polycentric urban scenario, especially in Italy and Europe.

Third, one of the possibilities related to the use of this definition lies in this complexity and in the possibility of looking at it within a comprehensive perspective, bound by dynamics in common.

Indeed, the third reason for considering this conceptual framework is the underestimation in the literature of the specific dynamics of change affecting the so-called intermediate areas.

As already mentioned, literature has shown that these are territories undergoing deep transformations and challenging regarding, for example, the social and demographic composition and cohesion, the productive and labour dimensions as well as those relating to the level of territorial government, institutions and actors in these territories.

These processes are different from the long-term depopulation affecting inner and rural areas because they occur in the territorial context that experienced an important phase of social and economic expansion after World War II.

From the relevance in the scientific discourses derive the claim for the potential relevance in public debate and regarding the policies innovations related.

In this sense, the practical and social relevance towards *intermediate areas* can be seen as the interest in including them more clearly in the *urban* debate. Moreover, an explicit focus on the ongoing dynamics would allow more relevant and coherent policies fitted for this context and this territorial scale. Indeed, the social relevance of research explicitly focused on "intermediate areas" also lies in the possibility of looking at these places organically and independently of the metropolitan core. This is possible only by considering metropolitazation as an urbanization movement *tout court* and not only as extension of the metropolitan. This shift is important not only from the scientific perspective

but also in a more practical reference related to representations and imaginary of the inhabitants of these territories. Territorial literature, indeed, once focused the gaze on the mountain areas and peripheral and more in general on the *inner* areas (De Rossi a cura di 2018), now invites the voice and interest of a third point of view.

Thus, the need to bring "intermediate Italy" back to the center of a discourse and representation is emphasized from several sides (Barbera 2022), since it is a context that is in fact often "neglected, on the margins of the dominant narrative, excluded from specific territorial policies (Barbera 2022). This interest should not coincide with rebuilding them in an aesthetizing key, making up qualities where there aren't, but this means recognizing that they exist as an actor provided with territorial agency, object of site - based policies that respond to specific (local) needs and demands and not to other external demands.

The interest in mobility and infrastructural processes thus goes in the direction of investigating the infrastructural transformation and the related possibilities of moving in these kinds of territories and how the demand and needs for mobility have changed there.

The attention in studying infrastructures and mobility also lies in other scientific, practical and social reasons, which can be summarized in looking at sustainable transition processes and bringing relevant knowledge propaedeutic to change. Indeed, by investigating the railway infrastructure in this context and its recent transformations, it is possible to highlight the possibilities related to transit in the framework of the decarbonisation of transport. Considering that these territories are strongly car dependent, this work encourages, moreover, the interest in looking at sustainable transitions of mobility practices and policies.

In accordance with the methodologies chosen, this aim is also pursued through the attribution of voices to those who make or have made a sustainable choice in their practices, i.e. commuters and travelers who move and cross the intermediate areas by train, investigating how these possibilities have changed and how the public policy sector and the railway sector have changed in terms of user perceptions and representations.

Observing at how railway transformations have been perceived by users provide insights towards the high-speed network as system in practice and not only as a theory of the main axes. This also means looking at the underestimated the relationship between high, low and medium speed in its territorial practice.

One last possibility of this work relies thus in the possibility of creating awareness regarding the exclusion risks of *intermediate areas* associated with the processes of polarization of rail transport

united to mentioned processes of urbanisation and metropolitanization. This could help in visualize and giving substance to the underlying territorial fragilities and territorial marginality, highlighting them not only from the point of view of inner areas or urban peripheries.

1.8 SUMMARY OF THE CHAPTER AND EXPECTED RESULTS

In answering the research questions, the expected results concern a more complete understanding of intermediate scenarios - non-metropolitan and non-inner- in the Italian context. Clearly, these results may be useful for an understanding of the intermediate scale more generally in Europe, once compared with the contexts on the ground.

A more complex definition of intermediate areas that includes contexts that are now analysed separately would provide a clearer idea of the important demographic, spatial and public role of these contexts. A broader view of these contexts would also allow the possibility of integrated policies.

Secondly, a closer look at the intermediate areas of north-western Italy would allow a field test of the risks of spatial and infrastructural marginality highlighted in the literature.

Finally, a more complete picture of mobility dynamics, practices, flows and demand in the intermediate areas is expected, especially with regard to the use of railway infrastructure, the related expectations and mobility cultures. In this sense, analysing the mobility strategies of commuter inhabitants in a context of transformation in multiple perspectives.

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NORTH WEST INTERMEDIATE ITALY AS A CASE OF TERRITORIAL TRANSFORMATION

LAYERS OF TRANSFORMATIONS

Figure 3: Theoretical design of the research

PART 1: THEORETICAL ASPECTS OF THE RESEARCH

CHAPTER 2

INFRASTRUCTURES AND MOBILITY AT STAKE IN THE TERRITORIAL TRANSFORMATION

Introduction

First part of the theoretical argument is focused on infrastructures considered as relevant lenses in the reading of territorial transformation processes, looking first at the infrastructure as comprehensive and complex objects that goes behind the material, immaterial service provision dichotomy but considering infrastructures as the texture that fully enable the "citizen rights". Secondly, the interest on infrastructure focuses on the mobility one and the long-term debate about their specific nexus in the production of territorial landscapes and the urbanization both from the historical and the planning sides.

Nevertheless, considering only mobility infrastructure in reading territorial transformations and processes related is considered not enough for the purpose of the research. Indeed, considering mobility as a complex system where mobility infrastructure constitute only a piece of the scheme, it is relevant to considering mobility as a complex object tin which mobility technologies and innovations loses their sense without the consideration of mobility demands and mobility practices of people from one side and the policies from the other. Thus, the theoretical argument discusses the notions about mobility, with accessibility as a crucial component, mobility practices and the multiple conceptualization that revolve around the knot of mobility and inequalities (among others accessibility inequalities, social exclusion related to transport, transport poverty, transport disadvantage, transport and mobility justice).

Following chapter (cfr. 3) focuses more clearly on the different conceptualizations about territory, its organization and transformations, the polycentric network and the different processual degrees of centralizations, hierarchies and territorial marginalities. Then, I will give an introduction "intermediate area" and how has been inserted in the literature about urban phenomena both in Italian context both internationally and how this notion is related to the several territorial labels that converge in the "residual" definition of "intermediate areas" .

2.1 INFRASTRUCTURE AS AN ANALYTICAL LENS OF SPATIAL TRANSFORMATIONS FOR THE SOCIAL SCIENCES

> There are foundational tensions between how engineers and anthropologists engage infrastructure systems. Interdisciplinarity is a necessary step in deepening our understanding of social and spatial dimensions of infrastructure systems, but it should not be an assumed theoretical or policy panacea. Bringing together engineering, political−economic, and experiential−affective discussions are valuable as a ground to interrogate the commonalities and contradictions emerging within the current infrastructure turn.
>
> Addie et al 2018 p. 18

The lens that this work proposes in reading territorial transformations and specifically the dynamics of *intermediate areas* is the one of infrastructure. On the relationship between infrastructure and territory the literature has long focused, and this chapter does not pretend to exhaust the topic as much as to provide some ideas useful for further discussion.

If the territory is subject to changes that occur at different speeds and rhythms depending on whether we look at it from a social, spatial or institutional point of view (Balducci, Fedeli, Curci, 2017) the role of infrastructures takes on a non-negligible role.

This role is equally relevant if we frame a definition of infrastructure that transcends only material and mobility infrastructure but also considers it in complex and comprehensive terms of services and functions whose presence, as we have seen, assumes a crucial role in processes of territorial transformation and in the design of territorial hierarchies.

Infrastructural processes, such as road construction, opening of railways have historically marked the landscape and emerged as dense attractors (Shipper and Schot 2011).

In this regard, the definition that *foundational economics* (Collective for Foundational Economics 2018) provides of infrastructure as the basis for daily life can be helpful in introducing the topic and the relevance for the work. The "foundational economy" is defined in terms of "goods and services that are indispensable to the general welfare: they are services necessary for daily life, are used every day by all citizens regardless of income and are distributed to the population through networks and branches" (Collective for Foundational Economics 2019 p. 26).

Considering mobility infrastructure within the framework of foundational economics (Collective for Foundational Economics 2018; Barbera et al 2016) can also be useful to redefine infrastructural ontologies within a unified analytical framework in which multiple infrastructural typologies

converge: from those of mobility and logistics to those of the social network, welfare, environment and digital, overcoming the polarization between explicitly material infrastructure and the rest. They are, in fact, "territorialized" goods and services (Barbera et al, 2016) and, therefore, useful in a research interest that has a crucial component in the territorial vision: cables and pipelines, networks and branches that allow the connection to essential services such as water, electricity, retail banking, food, public transport, roads, up to the welfare state.

It would be crucial for a full comprehension of the territorial complexity to see through the same prims the different levels of infrastructure that act at the same time, to visualize its dynamics not only in terms of cohesion and possible spatial development, but especially in terms of socio-spatial equity and ecological transition.

This approach thus makes it possible to view not only the complex and interconnected system of possibilities, but also the territorial dimension and that of equity and social justice sustained (or not) by infrastructures.

This view thus makes it possible, on the one hand, to look at infrastructures not from a specifically technical and design point of view and, on the other hand, to propose a renewed approach to the socio-territorial inequalities produced by mobility and its networks.

Infrastructures are thus configured as possibilities of access to and exclusion from citizenship rights: these are indispensable conditions of access to goods and services, a key factor of social and territorial integration (Colleoni, 2009) but at the same time a vector and way of reproducing inequalities.

2.1.1 Different layers of infrastructural definitions

The *Fundational Economics* approach is, however, only a part of a broader movement of epistemological restructuring of infrastructure itself, which raises a wide range of different issues, operating with even widely divergent policy orientations and research methodologies. It is an issue that has only recently, since the first decade of the 2000s, entered the Social Science debate. In the words of Grahm and Marvin (2001 p. 18) in fact urban infrastructure networks and the mobilities they support have very much been left as the 'Cinderella' of contemporary Urban Studies and urbanism.

In this section, we survey several indicative research clusters, networks and projects to illustrate how the *infrastructure turn* is framed by, and institutionalized in, a new landscape of urban infrastructure knowledge production. These initiatives pose an impressively diverse range of questions and operate with divergent political orientations and research

methodologies, but they all use infrastructure to explore widening socio-spatial rifts and inequitable urban growth dynamics.

The umbrella term "infrastructural turn" allows us to synthesize a growing literature (Amin and Thrift 2002, 2017; Simone 2004, 2006; de Boek 2011; Grahm and Marvin 2001) that develops a critical understanding of the role of infrastructure in shaping multiscalar spaces, places, everyday (urban) life, and the dynamic configuration of social relations from its technological organization and the role of materiality.

Rooted in currents such as actor network theory and assemblage theory, (Harvey et al 2017) focused on the role of materiality in the social world, urban space is conceived through its technological and infrastructural construction that serves the functions of a particular urban and spatial form (Burchardt and Höhne 2015).

In other words, the infrastructural turn challenges the widespread conception of infrastructural systems readable exclusively as a stationary and neutral set of physical artifacts. Differently, these authors promote a growing interest in how, and to what extent, infrastructure configures urban practices, bodies and encounters, investigating how economic and political forces recompose themselves within infrastructural processes-sometimes with unexpected effects. In other words, the infrastructural turn aims to transcend the established notion of materiality as a mere expression or representation of social orders (Höhne 2012) by emphasizing, instead, the constitutive role of technologies in society, especially in the urban sphere. The 'scientific and academic interest has been matched by a renewed public debate.

Defining what is meant by infrastructure, however, may not be straightforward. In fact, many authors (Harvey et al 2017; Simone 2009; Leight Star 1999) point out that infrastructure takes the form of "conceptually unruly" (Larkin 2013), objects of which "a definitive definition remains elusive" (Harvey 2017).

Infrastructures are matter that enable the movement of other matter. Their peculiar ontology lies in the facts that they are things and also the relation between things. (Larkin 2013 p. 329)

Infrastructures, according to many studies (Larkin 2013, Harvey 2017, Grahm and Marvin 2001 Addie et al 2018, Amin Thrift 2017 Burchardt and Höhne 2015) can be understood -with definitions largely but not completely coinciding- as: (i) socio-technical apparatuses and material artefacts that

structure, enable and govern the circulation in particular of energy, information, goods and capital, but also of people, practices and images (Burchardt and Höhne 2015); (ii) systems i through which goods, services, knowledge, meanings, people circulate (Amin and Thrift 2017); (iii) material networks that facilitate the flows of people, goods, energy, water, waste and information and enable their exchange across space (Addie et al 2018); (iv) as 'dynamic, technologically mediated forms that continuously produce and transform socio-technical relations: Extended material assemblages that generate effects and structure social relations, both through engineered (i.e. purposefully planned and implemented) and un - engineered (i.e. unplanned and emergent) activities" , doubly relational due to their simultaneous internal multiplicity and outward connective capacities (Harvey 2017). Moreover, authors referring to the infrastructural turn agree around an ecumenical definition of infrastructures: they can be considered both as hard systems and as soft social networks, conceived both as the object and as a methodological and analytical tool to look at territorial governance.

As physical forms, infrastructure shapes the nature of a network, the speed and direction of its movement, its temporality and its vulnerability to failure. Infrastructure generates the surrounding environment and constitutes the architecture of circulation, literally providing the basis of modern societies (Larkin 2013 p.328). At the same time, infrastructure mediates social relations by constituting the formations of subjects, modes of production and consumption, as well as the many routines of daily life and the ways in which people meet and interact. This makes it clear how strongly social the study of infrastructure is, at least as deep as the relationship between humans and technology.

Although infrastructures often appear to be depoliticized, nevertheless from these conceptions, it becomes apparent that they carry crucially political or normative expectations of their 'ideal' users and their power to transform communities and territories (Burchardt and Höhne 2015). This approach to infrastructure shows the non-neutrality of socio-technical networks: looking at infrastructure means looking not only at the material and technological system but also at deeply political objects (Amin - Thrift 2017), institutional objects, considered as 'bureaucratic bodies'. As highlighted, they are configured as a form and practice of governing a territory and therefore a good way to observe and unravel the 'threads of power', its forms of exercise (Amin Thrift, 2017), and the different interest groups involved. This approach has been synthesized (Larkin 2013) through the concept of *technopolitics*, whereby infrastructures are seen as revealing forms of the political rationality behind technological projects. To which is added a definition of infrastructure in terms of a 'mixture of political rationality, administrative techniques and material system' (Larkin 2013).

As mentioned above, infrastructures can be seen as the result of a cognitive, cultural, and political construction defined by certain coalitions of actors, for whom the movement of goods and people is intertwined with multiple, diverse and sometimes dichotomous meaningful visions of the territory subject to and sensitive to varying degrees of contestation and negotiation.

To consider infrastructure politically, as Amin and Thrift (2017) suggest, is also to focus on the 'brutality' (Cresswell 2006) of urban systems whose political economy determines 'life and death simultaneously', obstacles and possibilities. Addie and colleagues (2017), regarding the underlying inequalities, argue that these infrastructures (and the related infrastructure regions) are always in the making, but the ability to produce and claim them is unequal distributed. Indeed, infrastructure and its regions are experienced in varied spatial and temporal frames within which gender, class and race shape the parameters of urban life and social reproduction (Bullard & Johnson, 1997; Siemiatycki et al., 2019). The demand for infrastructure would thus be delineated as 'a demand for a certain kind of habitable land' that can create new social and political movements that drive change (Addie et al 2017).

2.1.2 Disciplinary tensions

What has emerged in recent decades is, therefore, a conception of infrastructures not only as the setting of processes, 'invisible backdrops to social actions', but as specific objects and subjects of research whose etiologies lie in converging social forces, interests and ideologies.

> Multidisciplinary approach is essential to understand how such systems are governed and how they can support sustainable spatial development. frames an agenda that looks 'Beyond the subdisciplines of urban, development, economic or political geographies [to] consider the ways in which state/citizen relations are framed and shaped by the material world'. Transcending distinct academic approaches indicates the rich capacity for infrastructures to be marshalled to understand socio-spatial processes at the intersection of sociocultural, ecological and political worlds, and to conduct comparative work in a global context. (Addie et al 2018 p. 13)

This is intertwined with the approach suggested in many way of looking at the city, and territorial processes more generally, *from the inside out (*Amin and Thrift 2017), i.e. from the dense network of infrastructural capillaries and veins, that 'hidden - in - plain - sight' (ibid., p. 6), hidden and pervasive at the same time, without which the city would cease to exist, that central element that makes the

urban possible 'in its myriad forms' (Simone 2019). Amin and Thrift (2017) suggest in this sense the expression seeing like a city, presenting the urban as a vital, messy, machine-like infrastructural space. The city thus appears as a living being constructed from the action of numerous human and non-human actors who actively nurture it.

2.1.3 "From the inside out"

The already mentioned expression of 'from the inside out' recalls the concept of infrastructural inversion proposed by Bowker (1995) who, by drawing attention to the silent and unnoticed work performed by infrastructures, insists on the need to 'invert' their analytical focus. This unnoticed work has long been the focus of scholars who have reasoned around the paradigm of infrastructure visibility. Crucially contributing to the definition of infrastructure, in fact, are the peculiar regimes and degrees of visibility to which it is subjected, starting with the assumption that unless destroyed, infrastructure tends to remain invisible in terms of use and experience.

Susan Leight Star (1999), urging an *ethnography of infrastructures*, emphasised that invisibility is central to the infrastructural quality of a system (Star and Ruhleder 1996) and highlighted four fundamental properties: (i) being embedded within other structures and technologies, (ii) being invisible supports until broken, (iii) being a sine qua non condition of community membership, and finally (iv) the fact that they shape and are shaped by the conventions of a community.

Considering this, *infrastructural inversion* can thus be seen as "the methodological and conceptual move by which analysts have been able to bring to light the hidden relations on which regular circulation depends" (Star 1999).

However, the invisibility and modernity of infrastructure is continually being questioned: a reality of climatic and environmental transformation (linked to the ecological transition, but not only) puts the infrastructure system under varying degrees of pressure, highlighting its limitations and fragilities. But also, accidents, (errors, lack of communication) dramatically reveal the materiality of infrastructures and the everyday life of those who maintain and operate them.

The modernity inherent in infrastructural thinking thus falters

The continuous flow of infrastructure thus emerges as a fragile result subject to a dynamic of 'when' rather than 'what'.

The fragile temporalities of infrastructure have attracted increasing scholarly interest in these terms:

> "Increasingly obvious fragility of many infrastructures. Where breakdown is regular (Harvey 2005; Campbell 2012), or where infrastructures have collapsed (Simone 2004; Harvey 2015; Jensen

2016), patterns of visibility are quite different from those where connectivity can be routinely assumed.

Infrastructural inversion therefore takes on a dual significance: methodologically as an exercise in 'figure-ground inversion' (Bowker 1995) and simultaneously in empirical terms (cf. Jensen 2014), in situations where infrastructural problems or failures are both ubiquitous and highly visible. This redefines inversion not only in analytical terms as the recognition of new forms of infrastructural visibility as much as «that forms of inversion have multiplied in such a way as to blur the distinction between the conceptual and the empirical».

2.1.4 A second *symbolic* definition of infrastructure

Infrastructure is an object that has much to do with notions of modernity and the future. The arrival of the railways, modern mobility infrastructures *par excellence*, was simultaneously shot through with narratives of fear and confidence in progress, effectively marking the end of many worlds known and shared up to that point. Infrastructure is both alienating and de-alienating (Delakoglou 2010): alienating and dis-alienating. Within an underlying ambiguity, they are emblematic of alternative development futures that range between opposing lexicons: from utopian imaginaries of trust, solutionism and efficiency (whether utopian imaginaries of intelligence, efficiency, resilience and transformative governance) to more or less realised dystopias of collapse and failure (Marvin and Luque-Ayala, 2017; Monstadt and Schmidt, 2019). Dreams of the 'next infrastructural solution' are juxtaposed with the realities of urban decline, austerity, daily maintenance, and the task of dealing with the detritus of yesterday's spatial solutions.

Likewise, infrastructures have long been objects visited by scholars of migration and long - commuting (Viazzo and Sacchi 2012; Capello 2008; Miranda 1997) treated in terms of cultural flows, threads on which multiple possible belongings, anchorages, returns, imaginaries, cultural forms and desires travel (Appadurai 1996).

Infrastructure studies thus allow for a reconsideration of notions around modernity, producing their own definitions, imposing their own scalar, relational and temporal logic.

Infrastructures are monuments, not only in their capacity as great works, but also as vectors of a shared representation and the possibility of imagining oneself in a space. They are sometimes configured as collective signifiers that drag on themselves not only people and goods in movement but also histories more or less distant in the past, finding themselves acting as social glue and expressions of more or less explicit local rootedness. Mobility infrastructures thus take on the double

valence of objects that serve and help people leave but remain embedded in the memory of those who inhabit them on a more or less daily basis. In this sense, they are monuments insofar as they are "among the few remaining opportunities to collectively mark the territory" as they "represent the possibility of introducing a collective meaning into the anthropized territory". Thus, infrastructures can sometimes take on an obvious collective meaning. (link with scalar theme of major works)

The very imaginaries associated with infrastructures change over time and space, and with them the meanings of public and common change: infrastructures thus go from being desired to unwanted objects, tangible materialities of 'progress' but also symbols of corruption and scandals (Delakoglou 2019).

From a historical perspective, the very conceptualization of infrastructure finds its roots in the Enlightenment idea of a world in motion open to change where the free movement of goods, ideas and people creates the possibility of success (Larkin 2013 p. 332) and that is why the provision of infrastructures is so intimately caught up with the sense of shaping modern society and realising the future.

In other words, Grahm and Marvin (1996) suggest that we see them as mechanisms for controlling time, which stimulate the waves of social progress and help mark the contours of civilisation itself, from the possession of electricity to running water to the railways themselves. Infrastructure, in other words, makes us feel modern because we are heirs to the utopia of modernity and progress that was characteristic of expanding historical epochs.

The authors of the famous Splintering Urbanism (Grahm and Marvin 2001) outline this connection as follows:

> "Our starting point in this book is the assertion that infrastructure networks are the key physical and technological assets of modern cities. In fact, the fundamentally networked character of modern urbanism, as Gabriel Dupuy (1991) reminds us, is perhaps its single dominant characteristic. Much of the history of modern urbanism can be understood, at least in part, as a series of attempts to 'roll out' extending and multiplying road, rail, airline, water, energy and telecommunications grids, both within and between cities and metropolitan regions. These vast lattices of technological and material connections have been necessary to sustain the ever-expanding demands of contemporary societies for increasing levels of exchange, movement and transaction across distance."
> (Graham and Marvin, 2001, p. 10)

In other words (Hall and Preston 1988 p. 273), in modern society «much of innovation proves to be dependent, for its exploitation, on the creation of an infrastructure network (railways; telegraph and telephone; electricity grids; motorways; airports and air traffic control; telecommunication systems)».

From this perspective, the life and flow of cities can be seen as a series of closely related 'socio-technical processes' as the very essence of modernity. People and institutions make use of enormously complex technological systems (about which they often know very little) to unevenly extend their actions across time and space (Giddens, 1990).

Larkin (2013 p. 332) points out how difficult it is to separate the analysis of infrastructure from this 'sedimented history' and the belief that, by promoting movement, infrastructure produces change, and enacts the progress through which freedom can be won. Many infrastructure projects, in this sense, could be seen as copies financed and constructed so that cities and nations can take part in the common visual and conceptual paradigm of 'what it means to be modern'. This suggests that it is only partly true that infrastructures are ontologically invisible to the breaking point, as discussed above. Indeed, Larkin defines infrastructures as metapragmatic objects. Invisibility is certainly one aspect of infrastructure, but it is only one and at the extreme limit of a continuum of visibility that runs from invisibility to spectacle and includes everything in between.

The role as symbols of power and modernity thus makes infrastructures far from invisible: on the contrary, what is of interest, Larkin (2013) points out, are the ways and temporalities through which visibility is mobilized on a public and discursive level. Infrastructure, Carse (2012) continues, cannot be or end up in the 'background' as visibility is 'situated' and what is 'background' for someone else may be 'daily object of concern'.

Moreover, infrastructure can be seen as the language through which the body (and mind) learns about modernity and its attributes: Mràzek (2002 in Larkin 2013) highlights this connection in these terms:

> infrastructure is not just a technical object but a language to be learned, a way of tuning into the desire and sense of possibility expressed in the very materials of infrastructure.

As anticipated, the aesthetics of infrastructure is not only about representation, but the aesthetics of infrastructure is an embodied experience governed by the way the environmental conditions of everyday life are produced, from a sense of temperature to speed etc. Infrastructure creates a sense of modernity (Mrázek 2002), a process through which the body, as well as the mind, perceives what it means to be modern, changing and progressive.

In a felicitous expression, Mrázek (2002) describes the experience of infrastructure as 'enthusiasm of the imagination' in reference to the feeling of promise that technologies such as infrastructure can stimulate. In fact, infrastructures, Larkin (2013) resumes, "can also be an excessive fantastic object that generates desire and awe in autonomy of its technical function".

Investment in infrastructure thus responds to various rationales, not only economic: "but the construction of miniature metropolises could be understood as an investment in a new being, in a new humanity, in a new cosmos".

> Roads and railways are not just technical objects then but also operate on the level of fantasy and desire. They encode the dreams of individuals and societies and are the vehicles whereby those fantasies are transmitted and made emotionally real. (Larkin 2013 p. 333)

In this sense, Larkin emphasises how infrastructures constitute 'us' as subjects not only on a technopolitical level but also through the mobilisation of affects, of a sense of desire, of belonging, of ties, of frustration, feelings that can be profoundly political.

It implies a deep emotional investment as well, which gives rise to a wide range of responses and sensitivities - sometimes counterintuitive - regarding the multiple possibilities of being modern and having a future. Infrastructure simultaneously represents its own promise and failure, it enlivens a complex mixture of desire, fantasy and pride about which the social sciences have written much and can still say much.

> And it forcibly reminds us that the deeply affectual relation people have to infrastructures - the senses of awe and fascination they stimulate - is an important part of their political effect.

2.1.5 A *global* perspective

More markedly, the Global North's normative notion of infrastructure is disrupted and complexified (Harvey et al 2017) by the perspective suggested in the literature (De Boek 2012 Simone 2009) of the Global South, which expands the definition by looking at processes of infrastructural informality. This is summarised by the felicitous formula proposed by Simone (2009) of people as infrastructure. In contexts of infrastructural weakness, characterised simultaneously by regularity and temporariness, in fact the paradigm of the visibility of the infrastructure is short-circuited and its very presence is linked

to its absence. In this sense, the infrastructure delineates itself at the same time formally and informally, materially and immaterially producing its own temporalities and customs. Infrastructures would be constituted by bodies, voices, but also by mutualistic practices and informal assemblages that buffer or replace the missing formal infrastructure tout court. Infrastructure is thus (re)realised on the ground in improvised, hybrid and performative ways (Caldeira, 2017; Ranganathan, 2014). This approach highlights the malleability of infrastructural systems in continually producing and disrupting 'cities in the making' (Silver & Meth, 2018) and shows how infrastructure is open to appropriation and adaptation by individuals and communities in ways that are not anticipated by the formalised logics of urban administration. In Simone's (2015, p. 375) terms, infrastructural lives reveal the ways in which 'people figure themselves out through figuring arrangements of materials, of designing what is available to them in formats and positions that enable them particular vantage points and ways of doing things'.

Although the processes are delineated differently depending on whether one looks at them from the perspective of the Global North or the Global South, nevertheless the literature points out that the 'global conversation about infrastructure' primarily calls into question the capacity of infrastructural systems to support materially and metaphorically 'our collective urban futures' (Addie et al. 2020 p. 11)

> There are important distinctions between the infrastructural experiences of the Global North, South and East–but seemingly distinct global conversations about growth and decline, connectivity and marginalization, investment and disinvestment are all grounded in the capacity of infrastructural systems to sustain our collective urban futures.

Invisibility as a constitutive element of the ontology of infrastructures is thus challenged by Larkin's (2015) reasoning, which emphasizes that infrastructures are far more visible, evident and 'provocative' than is sometimes pointed out. In fact, he proposes (Larkin 2015) a more complex definition in connection with the very notion of 'modernity' and the consequences that these have not only in the material sphere of the everyday but also in symbolic terms of the cognitive construction of the present space-time.

In other words, Delakoglou (2019) highlights how unreliability in infrastructure is a given element of the process and that unreliability is always embedded in infrastructure only becoming more evident in times of crisis. The invisibility of infrastructures, a frictionless experience can increasingly only be

experienced in fortuitous and condensed situations that largely concern the so-called Global North and its 'privileged global classes', while infrastructures are increasingly visible and perceived much less as 'neutral technological elements'. This line of reasoning, however, is not to be understood within a dichotomous logic between the Global North and the Global South, otherwise more and more often that disruption and visibility of infrastructures concerns the everydayness and disruption of the social body.

In fact, considering infrastructures as "the main materialization of the relationship and pact between people (citizens and non-citizens) and the otherwise abstract state and supra-state authorities" (Delakoglou 2019), it becomes clearer how the breakdown of infrastructures translates into the breakdown of that relationship, of that pact and of that mechanism of delegation to the guarantee of conditions of well-being and security shaped by technical and institutional rituals of modernity.

This means not only the collapse of a more or less monumental public work, not only the collapse of the trust at the basis of the pact between citizens and institutions, but the collapse of a specific idea of the state that conceived that infrastructure.

The collapse of positive expectation and trust also returns a fragmented and disoriented social body. The recurrence of the infrastructure crisis undermines the fifth of invisibility mentioned earlier and brings them back into the limelight as the object and protagonist of a public, political and scientific debate. An object on which the measure of consensus can be played, on the ability of institutions and their personifications to mend that fracture of trust.

In summary, within the passage outlined by the 'infrastructural turn' there are many different approaches and strands of research that, as highlighted by Addie et al. (2019) find common ground essentially in five elements: 1. the ability to break down academic silos and compel researchers to multidisciplinary; 2. the interest in an ecumenical definition of infrastructure; 3. the evidence of a highly political character of infrastructure both as a mode of territorial governance and with respect to the role of infrastructure in connecting people and locations within shifting configurations of power. 4. An interest in the pragmatic dimensions of infrastructure financing and maintenance relating, for example, to processes of infrastructure financialization (Foundational Economy Collective 2017) and, more generally, to the economic role of infrastructure within public policy in terms of the common good. 5. Finally, as this work investigates at length, a common ground concerns the relationship between infrastructure and urbanization. To summarize, works that refer to infrastructural turn projects reflect an interest in "exploring infrastructure as an intersectional concept that connects the global to

the local, the economic to the social welfare, the powerful to the spatially disadvantaged, the monumental to the mundane" (Addie et al 2019).

As we have seen, railway lines and tracks, stations and so on are embedded in that complex system of tangible and intangible infrastructures that not only enable the exercise of citizenship rights but also shape everyday life *tout court*. Conceptually and operationally, or at least they should, in terms of an integrated system, be synchronized in terms of location and timing.

Infrastructures, in addition to delineating degrees of territorial centrality, construct a map of the world in terms of a built environment of which the road, the simplest mobility infrastructure, delineates a degree zero. The road, in fact, not only allows the movement of people but can be configured as the organizational degree zero of space, a defining element in metaphorical and material terms. In other words, "roads are the archetypical human - made networks, the first network that our bipedal ancestors created" (Delakoglou 2010 p. 146). The construction of infrastructures, moreover, acts on the level of scalar understanding of the territory: with the construction of a bridge or a road, the distance between two sides or between two points takes on a scale comprehensible to human experience and the place where it rises enters the collective and individual memory.

2.2 ROLE OF MOBILITY INFRASTRUCTURE WITHIN THE TERRITORIAL TRANSFORMATION: SOME INSIGHTS FROM THE LITERATURE

> First, economic, social, geographical, environmental and cultural change in cities is closely bound up with changing practices and potentials for mediating exchange over distance through the construction and use of networked infrastructures. 'Technological networks (water, gas, electricity, information, etc.) are constitutive parts of the urban. They are mediators through which the perpetual process of transformation of Nature into City takes place' (Kaika and Swyngedouw, 2000, 1). As Hall and Preston put it, in modern society 'much innovation proves to depend for its exploitation on the creation of an infrastructural network (railways; telegraph and telephone; electricity grids; highways; airports and air traffic control; telecommunications systems)' (1988, 273). In a sense, then, the life and flux of cities and urban life can be considered to be what we might call a series of closely related 'sociotechnical processes'. These are the very essence of modernity: people and institutions enrol enormously complex technological systems (of which they often know very little) to extend unevenly their actions in time and space (Giddens, 1990).
>
> (Graham and Marvin 2001)

Once infrastructures have been placed within a broader conceptual frame, one can get closer to mobility infrastructures and the crucial role they have specifically played in the urbanization and spatial transformation processes outlined.

From a historical point of view, mobility infrastructures and especially railway infrastructures have played a crucial and extremely relevant role in shaping territorial transformation. This has occurred on several levels: from the point of view of the shape of the city within it, its historical development, especially from the node of industrialisation, and its metropolitan and regional unfolding. Mobility infrastructures have also shaped the territory in terms of expectations and spatial-temporal perceptions of distances, continuously constructing and redefining them in material and symbolic terms.

Infrastructures play a crucial role in the urban, territorial and ideological landscape, but not only: in fact, more generally, literature has profoundly documented the role they have and have had in redefining spatial-temporal categories *tout court* (Cresswell 2006; Shivelbush 1977; Le Goff), for example thinking of the experience of 'destruction of space and time' for the early train passengers', but also of the synchronization of clocks in accordance with the emerging railway timetable. In 1883, indeed, in the United States, the railway imposed four uniform time zones and the following year established the Greenwich meridian as a reference point in the division of the world into 24 time zones. In Italy (Maggi 2003), station clocks were adjusted from day to day according to the time indicated by the train conductor of the first convoy in the morning, who in turn had to align his clock to that of the station of departure.

Instruments that completely redefined the notion of time were defined as transitional markers (Harvey 1990), between historical epochs, as had been the case with calendar reform in defining the transition from medieval to modern times.

With the railways and the related redefinition of movement, time thus finds rationalisation and mechanisation, the invention of the railways leads to a redefinition of the categories of space and time. These are continuously redefined from a negotiation of the relationship between potential infrastructural opportunities tout court - the technological level of a given context in an era - and the individual and social capacities to access these opportunities. However, movement and mobility emerge as vectors of production and reproduction of space-time categories in absolute terms and in practice.

If, in fact, infrastructures reshape and produce the world in material terms (such as urbanisation processes) and conventional terms (the synchronisation of clocks), movement redefines the categories

of space and time in absolute and abstract terms while mobility in terms of the defined and corporeal experience of time and space.

The mechanisation of movement delineates a substantial transition between a before and an after. In fact, what Shivelbush (1977) calls the "annihilation of space and time" is affirmed: space and distances are progressively reduced (shrinking space) starting with the redefinition of speeds. This happens in different ways depending on the contexts, redrawing geographies that are sometimes 'condensed' and 'reduced'. From the 19th century onwards, an alteration of spatial relations at regional, national and international levels takes place, outlining a simultaneous dual process of shrinking and expanding distances and space.

> The dialectic of this process states that this diminution of space (i.e., the shrinking of transport time) caused an expansion of transport space by incorporating new areas into the transport network.

On the one hand, railways open up new spaces of accessibility, mediating the very process of urbanization (Shivelbush 1977), regardless of geographical remoteness, since the dawn of the spread of the railways, regions appeared so close and easily accessible in relation to the presence of the railway. In fact, the perception of time and space mediated by railway infrastructure is completely restructured in comparison to that of previous forms of transport, considering the renewed possibilities of movement.

At the same time, the mechanization of movement brings with it the destruction of the spaces of travel, which on a perceptual level become more and more invisible and confused for the traveler who crosses them at an ever-increasing speed, especially in the absence of the dense network of roads that will spread from the post-war period with the spread of the automobile. The fully visible and well-defined spaces of the train journey remain those of the departure and arrival stations: the rest blurs to the point of S. says 'destroying itself'. The consequence of this process is the continuous redrawing of historical and territorial belongings, of relations of proximity and closeness, as well as the entry into the possible imaginaries of 'new' places: the matter of the 'new accessibility' is thus configured as an enlargement of the space of possibilities primarily in cognitive terms, as well as purely geographical. Within a happy metaphor, the gateway to a region, the 'customs', the frontier, the barrier, moves onto the track of the train departing for a foreign state or inside the carriage itself. This happens on a symbolic, cultural and cognitive level, but also on a political level. It is a common experience, when taking a train to return 'home', or to somewhere else, to perceive in the train carriage an initial gateway made up of accents, ways of dressing, languages and products.

> Io devo dire una cosa che ho sempre avuto ancora prima di fare la pendolare (…) il treno è quel mezzo di trasporto che a me da proprio la sensazione di unione tra due posti perché c'è il binario, cioè se prendo il treno non mi sento mai troppo distante da casa, se viaggio in macchina si, se viaggio in aereo ancora di più. è ovvio spesso può essere una questione di distanze reali però il treno ti dà sempre l'idea di essere legato a casa, se tu fai Genova - Roma in treno sai che il binario inizia lì e finisce lì e in qualche modo sei sempre legato a casa quindi si, ti accorcia molto le distanze.
>
> Paola, 25, Student, Commuter Genova – Pavia – Milano

In political terms, this has long been investigated by migration scholars in terms of the 'externalization of the border': the space of the border becomes mobile and condenses at the station, on the platform and in the very carriage of a departing train, and with it the related practices of control.

As pointed out (Cresswell, 2006; Sheller, 2018), transport can become a constitutive element of the making-border and sensitive sites of migration control', making the political dimension of mobility evident again.

In sum, infrastructural processes, such as road building and the opening of railways, have historically marked the landscape and emerged as dense attractors of material and communal imaginaries (Maggi 2003 ; Shipper and Schot 2011). Historically, the literature has highlighted the 'integrationist potential of infrastructure' (Shipper and Schot, 2011), not only from the perspective of 'enabling flows and facilitating intercontinental interdependencies' but also from the perspective of building 'imagined communities', in which ideals are juxtaposed with feelings of belonging.

While the role that railway infrastructures played in the Italian Risorgimento has been widely documented both on the level of war and on the level of the "hopes" of Italian political and economic unification (Maggi 2003), in recent decades this has been analyzed with reference to the integration process of the European Union in terms of "infrastructural Europeanism" (Shipper and Schot 2011): a complex and not always linear process in which wills, actors, economics and politics continuously alternate.

2.2.1 Infrastructure as historical process

In the 19th century, the transformation of European cities accelerated in coherence with and because of the season of revolutions of the previous century. The radical change of urban and territorial arrangements can be interpreted as the translation and material and visible expression of the Enlightenment cultural revolution, of the American and French Revolutions and, in a more evident

way, of the Industrial Revolution. With the revolutions of the late 18th century, "the coherence of architectural and landscape design, the institutional and social continuity" of an ancient regime that had its well-defined roots in the late Middle Ages was challenged and overcome (Benevolo 1993).

This paragraph is aimed in framing the long term and deep role that mobility infrastructure took in shaping the history of the contemporaneity, of the cities that every day we live whose result derive from strategical interventions that had in the infrastructural level a crucial material and discursive component. The passage from "walking cities" to "transit cities", often considered as a turning point of the relation between infrastructure and territorial aspects in the European context takes root from the different revolutions of XVIII century, especially from the industrial one. These are the reasons why here this point is taken in consideration.

Institutional transformations, scientific progress applied to productive technologies, and economic and demographic development combined cross for the first time "a critical threshold" that puts the historical European landscape in crisis, "giving rise to a change of a revolutionary nature", changing for the first time since the 13th century the quantities and qualities at play in the European settlement system (Benevolo 1993 p. 161). These transformations took place on many levels such as demographic pressure and urbanisation processes, the industrialisation of the landscape and agriculture, and the construction of new roads, canals and railways. However, an important role is also played on a cultural level by the redefinition of the value system and the architecture of knowledge, and on an institutional level by the reconstitution of the interweaving of public and private responsibility and initiative, which consolidates new legal orders and redefines previous customs and regulations.

Within this generalised transformation, the industrial revolution, specifically, brings with it the mechanised transport revolution and lays the foundations for the so-called rail transport revolution which, as Shivelbush (1977 p. 178) points out, accelerates ongoing trends and influences the redefinition of contemporary topographies with the explosion of spatial boundaries; the horizontal expansion of urban space, the creation of specialized neighborhoods (residential, commercial and industrial, bourgeois and proletarian, etc.). Looking at the much-detailed process of hausmanianisation under the lens of infrastructural transformation, Shivelbush (1977 p. 182) suggests how the newly created Boulevards (and specifically refers to the Boulevard de Strasbourg) can be considered and interpreted as 'the direct continuation of the rails' in the city, complementary to the scale of rail traffic rather than the scale of the city. The innovative contribution of the Hausmannisation process, which is affirmed as classic in many European contexts in the urbanistic plans of the late 19th century, is to be found in this conceptual shift from a conception of streets from a neighbourhood scale, pedestrian-

friendly, as a *'forum for neighbourghood'* towards a scale specifically oriented towards transit and mechanized traffic. Streets thus redefine their semantics by shifting to perform exclusively connection functions. In this sense, as literature mention, Hausmann would act as a *railway engineer in the city* by cutting through what stood in his way. This causes a twofold process of spatial - temporal disorientation by the collision of this relationships: the traditional with the new, the acceleration of mobility given by the railway and the process of demolition and reconstruction of the city.

To summarise, at different speeds depending on the context, the emerging mechanized mobility infrastructure marked a crucial caesura in the history of the city. The transition can be explained on three levels:

1. on the one hand, the infrastructures materially and operationally reorganize the space of the city and the territory.

2. the different modes of movement of an ever-increasing share of the population marked the different stages of the urbanization process, the progressive 'becoming a city' with the delineation and succession of city and metropolis typologies.

3. Third, and no less negligible, as mentioned above, is the symbolic significance linked to the entry of the mechanical infrastructures of mobility 'in the city' on the level of related expectations and fears, of the values of progress and development already discussed.

2.2.2 Different generations of metropolises by infrastructure

There is thus a shift from the 'traditional city' to the 'first generation metropolis', a shift defined in literature from *walking cities* to *transit cities* (Martinotti 1993; Newman and Kenworthy 1999; Hall and Hay 1980 Colleoni 2019). From cities in which walking prevailed, characterised by small size and high density, there is a transition towards those in which mechanical means of transport are used.

As largely argued in literature, the advent of the railway in the city has a *centripetal impact* (Agustoni 2022): cities connected by the railway infrastructure tend to grow because of the ease to settle productive activities and attract population. More specifically, in the European city morphology the station, which was generally located just outside the *walls*, draws an unprecedented centrality around itself of landfall and functions (Sereno 2009). However, within the cities, the railways did not establish themselves as the main mean of transport, remaining linked to horse transport and later replaced in the late 19th Century by the electric tram and bicycle that caused the cities within to retain a compact

character. Subsequently, the emergence of electricity, the internal combustion engine and, above all, asphalt gave the city a *centrifugal thrust*, which, albeit subject to certain contextual conditions, extended the city beyond its traditional material and symbolic boundaries by the end of the 19th Century.

In Europe, a further historical transition in the relationship between mobility infrastructure and spatial transformation takes place in the aftermath of the Second World War. Indeed, under the push of several factors summarized below literature highlight the transition from *transit* to *automobile cities*. Fist reason regard the situation after the war. The railways emerged from the war with considerable damage, around 7,000 km of track had been destroyed in Italy alone. Reconstruction of the railway infrastructure was immediately challenged by the precarious socio-economic conditions of the post-war period, leading to a substantial restoration of the pre-war situation without taking into consideration the changed needs of the national production system.

The second factor concerns the progressive investment in roads and motorways: cheaper primarily for freight transport but also, especially on an urban scale, for passenger transport. Thus, rubber buses are supplanting tram transport and are imposing themselves for service versatility and cost-effectiveness. The design, implementation and maintenance costs of rail transport (be it tram or rail) are in fact significantly higher than those of road transport, which are imposed for mass and goods transport. Alongside these factors is the crucial spread of the private car both as a means of transport and as a positional and symbolic commodity of the economic boom (Colleoni 2019). The mass diffusion of the automobile not only radically changes people's mobility behaviour but also reshapes tout court the housing styles and expectations, the landscape, and the trajectories of coeval urbanisation. Post-war urbanisation is definitively intertwined with the spread of the automobile, with the branching out of motorways on both a material and symbolic level of infinite possibilities. Internationally, what characterises the *automobile cities* (Newman and Kenworthy 1999) are large, decentralised, dispersed, low-density settlements, characterised among other elements by the territorial separation between urban functions with the progressive distancing between place of work and residence, and dependence on the car.

The attempt to look at territorial transformations through the processes of mobile infrastructures is a long-term exercise, as Martinotti (1993) already pointed out that what contributed to redefining the form (and substance) of cities was the progressive expansion of the mobile potential of certain social groups that covered ever greater distances for their activities, sustained first by the arrival of mechanised means and then by the speeding up and differentiation of these.

Infrastructure and technologies 'make the city' in two senses: by materially enlarging it along axes (Colleoni 2019), by reconnecting it to other more or less small cities outside the urban administrative boundary, and by rearticulating people's daily routines. The transitions from *walking city*, *transit city* and *automobile city* are thus readable not only as a transformation of infrastructural and technological components but in close relation to the consequent reformulations of mobility behaviors and lifestyles with the related progressive enlargement of the "mobility capital" of social groups.

The social redefinition of the city has among its obvious components the material and symbolic 'entry' of 'new' populations with the consequent design of new functions, expectations and conflicts in the contemporary city. The permanence and rootedness in the city thus become progressively more fragmented in relation also to the possibility of moving continuously and quickly in and between cities and territories, with the growth of what Martinotti defines as *city users* (Martinotti 1993; Nuvolati 2002) ": temporary users of the city, characterized by short stays specifically aimed towards activities.

2.2.3 Mobility infrastructure projects, different scale vocation.

Looking more closely at the relationship between territorial production and mobility infrastructures, the question has been deeply explored concerning the role that these have and have had in shaping the Italian territorial landscape. Indeed, the dynamics of Italian urbanization have shaped and, at the same time, shaped today's infrastructural landscape, first along railway axes, then in relation to the road network.

Some approaches through which the nexus between mobility infrastructure and territory was analyzed are here presented. First of all, the nexus between infrastructure and spatial transformation described the changing morphology of the city, since mobility infrastructure itself mark the transition between the different types of cities (walking, transit and automobile cities).

Secondly, infrastructure projects are one of the most frequently mentioned objects when talking about transcalar conflicts. This leads to the two sides of the "infrastructure" coin: the one that addresses the scale needs for which it was designed and the actual territorial ground on which it rests. The interests at stake can often be discordant and of crucial interest in the study of these issues.

In this sense, the case of the Veneto region has been considered as paradigmatic of the ongoing change because of its specific characters: from a dense and entrenched, so-called porous infrastructural skeleton assimilated metaphorically to a sponge is superimposed a hierarchical structure of fast piped

infrastructure that progressively specializes the landscape. Lastly, the paragraph mentions the Transit Oriented Development approach particularly used in the context of densification planning that takes into account together mobility and habitability needs of territories.

With the transition to *automobile* cities (Colleoni 2019), the motorway system has played a similar role as the railway did in the late 19th Century in the infrastructuring of Northern Italy at the dawn of the industrialization process. Nevertheless, this process happened in different ways depending by the context. For example, the specific characterization of the so called *Terza Italia* made by small and family conducted enterprises gained importance especially because of the lack of main motorways that helped to consolidate local relations.

Nevertheless, the consequences of everyday mobility on urban social morphology have been largely discussed (Davico 2002). Motorways and a rooted network of road today have as a result the expansion of a kind of *diffuse city* from Milan, Brescia, Verona and Venice, via Emilia and the Adriatic.

More in general, Dematteis (2001) highlighted the 'morphogenetic' role of large infrastructures, in terms of their ability to structure territories and cities. Berta and Ambrosini (2004) speak of a "systemic interweaving between infrastructures, environment and settlement" and underline how the territory is not only the background of infrastructures, but the subject and at the same time the result of a complex action of transformation. Infrastructures, therefore, are to be considered not as extraordinary objects of the landscape, but as ordinary objects that contribute both to the performance of everyday activities and to experiencing the built environment.

Secchi (1989) interpreted the road as a continuous artefact, capable of generating urbanity sometimes in weak or minimal forms, including areas characterized by the persistence of minute networks or minor accessibility such as spontaneous pedestrian paths. The continuity of mobility infrastructures with the territory is measurable both in terms of material coherence with the built environment and the mobility network, but also in terms of possible policies that need to integrate land use ones to the policies focused towards infrastructure (Lanzani 2011) with the aim of a common gaze on the processes. Following part of the paragraph suggest some insights from the literature about this topic.

What is crucial for mobility infrastructures if considered in the territory as "territorialising process" is the fact that they test and confront (Bobbio 2006) different rationalities, actors and interests at the same time. The scalar processes, in this sense, assume a crucial role within this discourse.

Every infrastructure has a "justifying scale of reference" that makes it necessary to also take into consideration the trans-scale modalities through which they relate and reconnect to intermediate and lower scales, in terms of the complex interaction between supra-local scale interventions with the specificities and planning of local territorial systems. For example, the most famous and discussed case is represented by the High-Speed Railway that is conceived at the European scale, although it regards materially and politically different scale, such as the national, the regional, and the local that interact and need to be taken into account in the whole process.

Looking at these processes, Dematteis (2001) speak of a structuring and structured, direct and indirect, intended and potential action that the infrastructural project itself can play at lower scales. All infrastructural projects need to be considered *territorial* in the terms in which they infrastructures the territory both at the level for which they were conceived but also materially in the 'fields of externality' generated in space. Given that the transcale relations are often asymmetrical, and the *power of places* is not equally distributed, questioning the "significance that the location of certain infrastructural nodes takes on in certain local and regional contexts (ibid.)" becomes of primary importance. The actors - and their coalitions - involved in the infrastructural process have different voices, different languages, reasons, and mobilise different interests. Hence the oft-cited criticism (REF) that so-called large-scale projects impose a higher order on local communities, on a scale not commensurable with that of local life. Large projects in its relationship with the territories are considered thus a medal with two sides: on the one hand the *prevarication of giant concrete pylons* that insist on a *minute territorial fabric*, on the other a leap in scale produced by the sum of the interests involved, the widening of the network of relations and the combination of multiple wills (Piccardo 2020). In this sense, in the infrastructures interests that transcend the individual, the local and the particular are condensed there with the consequent risks of multiple conflicts between actors involved and scales of interests. The scale of the infrastructure calls for the imagination of a unitary project, which is possible through 'listening to and activating local projects developed over time by municipalities and associations'. This recalls the issues of the compensative policies and local projects and their lack in practices. As suggested, it is taken in consideration the theme of environmental compensation aimed at the redevelopment of open spaces rather than further building projects (Lanzani 2011 p. 257).

These issues closely touch on the space of *intermediate* and *in – between* territories which have historically been the places of 'crossing': the ground of different speeds of infrastructures that have not always reconnected harmoniously. This is clear in the mentioned High-Speed railway case where the instances of intermediate territories have been the subject of interesting research (Bobbio and Zeppetella, 1999; Dematteis and Governa, 2001).

In a contemporaneity in which the fates of the urban form and metropolitan structure are increasingly intertwined with the efficiency of the infrastructure system and transport networks (Davico, 2002) questions revolve around the possible reorganization and recalibration of territorial centralities due to infrastructural high speed projects.

Another way to conceive the suggested derive from the Northeast Italian context that due to some historical specificities. The case highlighted in this paragraph can be useful for the work to discuss the territorial – infrastructural relation in terms of isotopy or hierarchization.

Indeed, especially in the context of the *diffuse city*, «the mobility system relates terms such as hierarchy and isotopy, overcoming simplified logics of territorial and infrastructural models that are only apparently in opposition» (Velo 2022 p. 72).

This theme picks up on what had already been pointed out in the work by Fabian (2012) whereby the peculiar characteristics of the Veneto diffuse city risked being lost within a 'paradoxical' cartographic representation in which the processes of spatial hierarchisation starting from the infrastructural scope/scale are more evident. This is because the map, according to the authors, is configured as the slow deposition of an implicit infrastructural project that is returned through representation.

The structure of the Veneto's diffuse city is characterised by a territorial homogeneity, isotropy, which has historically organised the city's network of basic services. Witness to this is the homogeneous distribution of schools and churches in the territory that forms the backdrop to the housing and production network. However, "in the territory, the isotropic dimension is progressively regressing due to new processes of network hierarchisation and settlements in the form of clusters hanging from the fast network. When viewed on a national level, these take the form of an extension of the connections of the national motorway networks" (ibid., p. 22).

The long-distance roads and mobility infrastructures that act at supra-local scales, according to the happy metaphor proposed by the authors, would be the *pipes* that mark the perimeter and operate as 'detachment devices' that consider only the flow and not also the attack, realising a progressive specialisation and simplification of the territory.

In a hierarchical network, the different nodes do not enjoy identical connectivity to each other, a central node enjoys the maximum connectivity and only a few planes can separate the network into specular parts; to one or a few main centres correspond many subordinate centres possibly organised in different orders and differently specialised. Tosi (2012) points out how from a substantial territorial adherence

a "discontinuity was introduced concerning the scale of the interventions, the actors mobilised and the decision-making processes and localised functions: a hierarchised and specialised infrastructure that grafts little relationship with the reference palimpsest, introducing a new order of functioning of the territory. The territory would thus be configured as a mere support on which each actor carves out its own domain through forms of economic valorization that only casually intersect with the objectives of increasing collective wellbeing. This type of intervention, he concludes, gives rise to a major hiatus between the everyday territory and the territory of flows, produces obvious disconnections and processes of fragmentation of the territory and the populations living there.

Proceeding by metaphors, the authors proceed by suggesting the effective image of the *sponge*, porous and permeable, as a representation closer to the capillarity of the historic centers villas, schools, churches that are uniformly distributed over a territory with a very minute texture, and as an answer in terms of an integrated planning vision of the territory. The pipes would not be more important than the sponge but work together for the correct functioning of the network and the very performance of the infrastructure related to its territorial function. The vi devices that make up the infrastructure cannot be designed in isolation, the sponge must be understood as a great filtering mass that irrigates the territory and introduces the idea that the infrastructure project must take into account the system and the correct territorial scale within which it is located, not an element separated from its context.
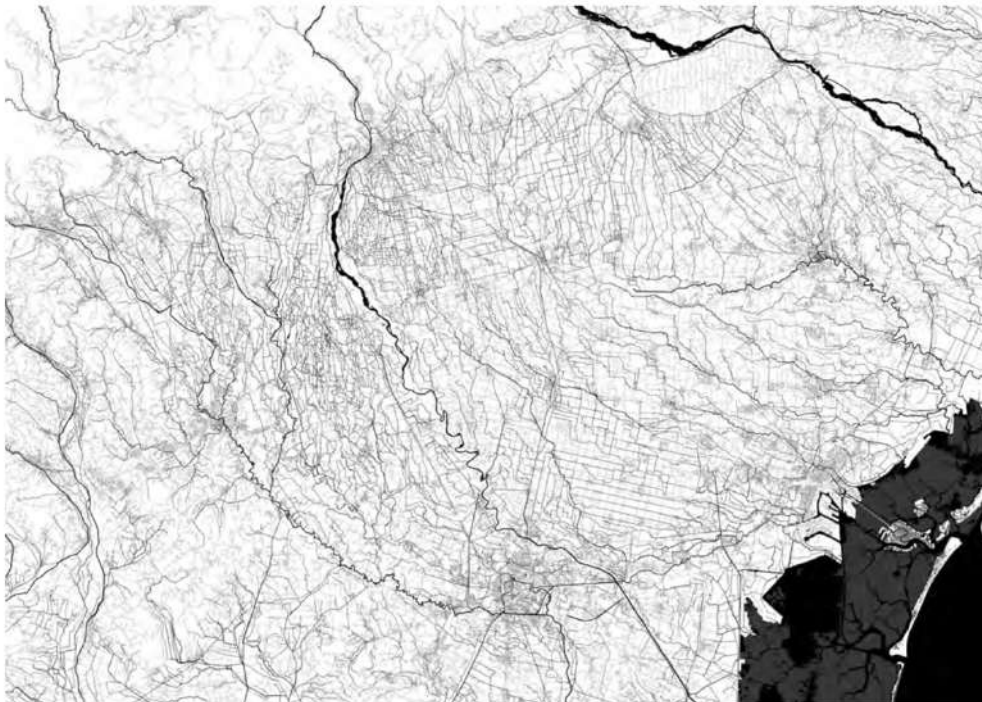

Map 1: The pattern of minor routes and hydrographic systems in Veneto region. Source: Velo and Munarin 2021 p. 28

2.6 MOBILITY: MOVING BEYOND TRANSPORT

As we have seen, infrastructures themselves are a long way from being regarded as mere technical objects that regulate and support traffic, but in line with a cultural and social approach to materiality, they lend themselves to multiple approaches and definitions. What interests this work, however, is not only a look at infrastructures but at mobility in general, starting from the complex conception of infrastructures discussed above.

2.5.1 Inside the *mobility system*

Considering the mobility as a *system* is a way to look at the mobility in its complexity through a common prism, considering as interacting the different components that allow the movement of people and freights. The mere analysis of infrastructures, as pointed out by many, is in fact not enough. In fact, infrastructures are only a part of the "mobility system" which includes (besides them and related technologies) also policies, demand, mobility behavior and practices, which can be read at different scales. The mobility system thus encompasses, on the one hand, the supply of mobility in terms of infrastructure, technologies, and service with its regulation in terms of policies, and on the other hand the demand for mobility of people, as well as the movement and logistics of goods.
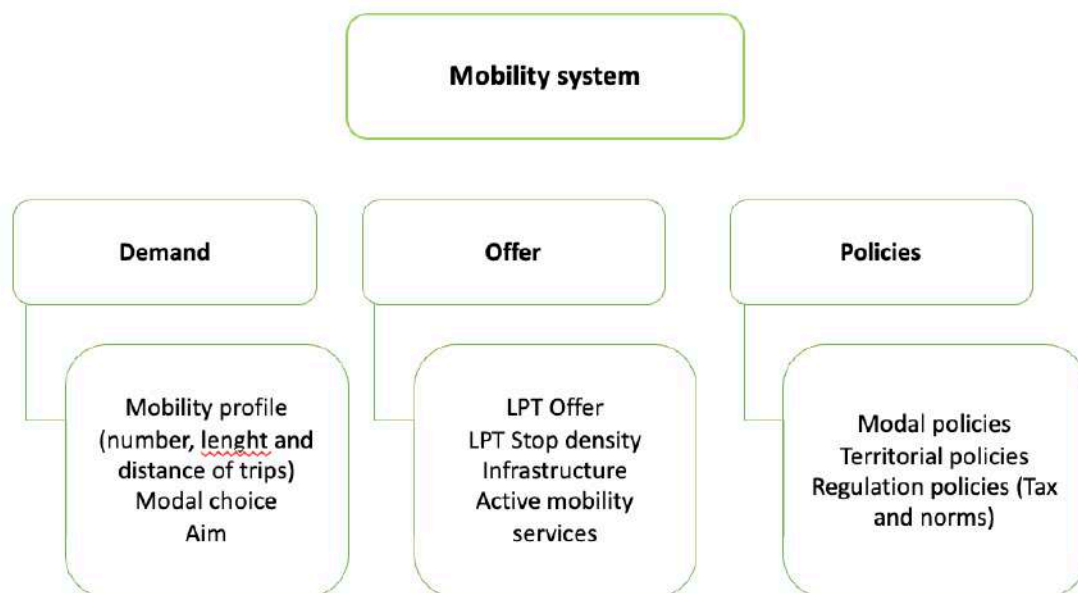
Graph 1: The mobility system. Source: Colleoni 2019

Specifically, the study of mobility demand has played a too often neglected role that demands greater attention. As pointed out (Cresswell 2009), there is thus a paradigm shift away from the conception of

mobility from the provision of infrastructural services towards a more complex approach, going beyond the mere material dimension of infrastructure towards multiple intersecting dimensions. This requires multiple competences and analysis approaches not only of a technical nature, although, at least in Italy, this debate has monopolized the possible public discourse on mobility. Mobility, on the other hand, is also and above all the meaning, symbol and culture of mobility, elements that can hardly be understood exclusively within technical metrics. The definition of mobility as a system, however, is not the only one and there are many ways to frame mobility: some of these definitions are proposed by the new mobility paradigm (NMP). However, before exploring the NMP, it is interesting to see how the notion of mobility has navigated the disciplines to have a clear portrait useful to introduce for the reader the empirical part of the research and it conceptualization.

In 'operational' terms, mobility can be defined as the 'subjective and objective propensity to be mobile in any mode in order to reach places where daily or extraordinary social activities can take place' (Colleoni 2013a, p. 228). In this sense, mobility is seen as a subjective propensity, as a property of subjects rather than a physical characteristic of places, delineating a shift in the gaze within which social scientists have much to say. The notion of mobility (Kaufman 2021) is slippery because it is a highly polysemous concept: different disciplinary traditions have given many interpretations of the concept and left different traces. For geographers, mobility is the act of moving through space, while for traffic engineers it may mean transport flows and for sociologist the self-transformation in the social structure. While this can be seen as an enrichment on one side, on the other it has been a profound obstacle to mutual understanding. The difficult transition towards practically sustainable mobility has often been the result of a lack of encounter and a long and profound mutual misunderstanding between conceptions, metrics and semantics around mobility, which have only recently begun to converge also linguistically towards a common problematic.

Within the panorama of the Social Sciences, the subject of mobility has remained in a marginal zone. Although its origins are deep, especially with regard to the study of territorial mobility as a social phenomenon. References can be found in Mauss (1923) who defined it as a total social phenomenon through which to read and interpret relations within society and in Simmel (1907) who defined it as an interpretative key to modernity, as well as in the authors of the Chicago school (Burgess and Park, 1925) who, looking at the relationship between the city, its morphology and social relations, anchor mobility to a spatial reference defined as an integral part of the urban way of life. Mobility in this perspective «measures social change and social disorganization, because social change almost always involves some incidental change of position in space, and all social change, even that which we describe as progress, involves some social disorganization»

However, this perspective is not defined autonomously and in the 1950s sociologists' interest in mobility focuses on social mobility at the expense of territorial interests. In this sense, laying the foundations for one of the classic themes of sociological study as that of social mobility, Sorokin in his Social mobility (1927) defines mobility as a phenomenon of displacement of the individual in social space: "a change in professional occupation, and identifies two types of movements: (1) vertical mobility, which implies a change of positioning in the socio-professional hierarchy, with a movement that can be upward or downward (e.g. a worker who becomes her own boss); (2) horizontal mobility, which refers to a change in status or category that doesn't involve any change of relative position in the social hierarchy (e. g. changing jobs at the same level of qualification and pay, without an explicit geographical referent, since movement in geographical space "has meaning only as it reveals or implies a change of status in the social space. Again, both Italian (Gallino 2009 first ed. 1978 Riccioni 1994) and international (Turner 2006) disciplinary dictionaries refer to mobility exclusively in terms of social mobility.

As Kaufman summarises:

> Throughout its history, research on mobility has been compartmentalized by discipline (geography, sociology, urbanism, demography…), each applying its own analytical reference framework and none dealing with all the forms of mobility.

With different national variations, three conceptions of mobility assert themselves, which only rarely travel in parallel, intertwining holistically.

From the post-war period onwards, a conception of mobility emerged that was mainly carried out in the geographical sphere, which defines spatial mobility according to the spatial-temporal variables of distance, duration and reversibility of displacement in the terms of everyday mobility, travel, residential mobility and migration (Table 2).

	SHORT TEMPORALITY	LONG TEMPORALITY
INTERNAL TO A LIVING AREA	DAILY MOBILITY	RESIDENTIAL MOBILITY
EXTERNAL TO A LIVING AREA	TRAVEL	MIGRATION

Table 2: The four main forms of spatial mobility. Source: FORUM VIES MOBILE

Nevertheless, between the 1950s and the 1970s, the study of territorial mobility and infrastructures became the prerogative of the transport sciences, which imposed in the literature (at least in the Italian context) a highly technicist and specialized reading of flows and infrastructures, often leaving aside the profound social implications that construct the imaginaries of meaning in which they are embedded.

To sum up, there are at least three conceptions of mobility in parallel. First, the conception of the sociologists that understands mobility as social mobility; second, the conception of the transport sciences that sees mobility as a mechanized transport flow; last the one of geographer that remained a long sectorial.

These three approaches and conceptions of mobility did not find a synthesis for a long time, making a holistic view of the mobility picture hard to obtain. This changed initially with the elaboration and dissemination of the New Mobility Paradigm (Urry 2001; 2007) and later with the urgent spread of the need for a sustainable transition, which, with a common purpose, brought together different professions, expertise and approaches. Moreover, If today this awareness has grown it is also because previously little considered actors, scales and instruments are now converging within the public and scientific discourse around sustainable mobility.

As mentioned, nevertheless, a crucial role in the affirmation of this epistemological awareness lies in the importance gained in the literature by the so-called new mobility paradigm (Sheller and Urry 2006). In this sense, Urry (2000) not only emphasizes the centrality of the concept of mobility in relation to transport and infrastructure, but also highlights its crucial role towards social and human relations. Cresswell (2006 p. 1) in this sense underline of the slippery and intangible character of mobility that makes it an elusive, yet central object of study for the human being as such. It is described as a "fundamental geographical aspect of existence" that provides a rich soil from which narratives and, indeed, ideologies can be, and have been, constructed". Indeed, as noted (Urry 2007), the new mobility paradigm is not only a content innovation in the study of mobility in the social sciences, but is transformative of the social sciences in general, its methodologies and disciplinary ontologies.

> First, all social relationship should be seen as involving diverse "connections" that are more or less "at distance", more or less fast, more or less intense and more or less involving physical movement. Social relations are never only fixed or located in place but are to very varying degrees constituted through "circulating entities". There are many such circulating entities that bring about relationality within and between societies at multiple and varied distances.

Within Urban Studies, as pointed out (Sheller 2018), the new mobility paradigm has been transformative of the 'less containerized' way of thinking about space, especially urban space, opening new perspectives to examine cities and their broader social relations, connections and flows.

Mobility (Cresswell 2006) understood as socially produced movement can be understood through three interrelated moments. Firstly, mobility can be considered as *brute* fact, *raw* fact, in terms of something potentially observable, an empirical reality, *something in the world*, in this sense Creswell refers to the mobility of macro flows, the routes from two points in the space, modelled, an approximation of pure, abstract movement. Secondly, mobility concerns the very ideas of mobility that are conveyed through representational strategies by attributing multiple possible semantics to it (from freedom, to transgression, to creativity...). Thirdly, and crucially, mobility concerns experienced and lived mobility: mobility in this sense, is an "irreducibly embodied experience", an experience of the body, a way of being in the world. In this sense, one can trace the importance of analyzing the representations of mobility insofar as they justify and substantiate movement itself. Movement, as has been studied at length, is configured "as the spatialization of time and the temporisation of space" (Cresswel 2006), space and time are simultaneously the context of movement and the production of movement: the movement of people and objects is the agent of the production of time and space. The question of the social production of space and time has received sustained attention in the social sciences and humanities in recent years. What we are interested in highlighting in this discourse is how mobility is movement in practice, as proposed (Cresswel 2006) if movement is an abstraction composed of the absolute notions of time and space, mobility corresponds to and is composed of elements of social space and time, as an aspect of completely social life imbued with meaning and power. Therefore, mobility, considered as a social product, does not exist in an abstract world of absolute space-time but exists in a meaningful world of social space and social time and mobility is itself an integral part of the process of social production of time and space.

In line with this, the literature (Jensen 2020) suggests that it is important to focus on how mobility practices and networks are culturally assembled in the production and functioning of the urban and the territorial, especially from the Social Science perspective. Therefore, a perspective focused on individual choices, technical transformations and the effect of economic forces is not enough in the spatial transformations analysis (which, as we have seen, are deeply intertwined with changes in the mobility scenario). On the contrary, a look at what the literature calls mobile ontologies: in which movement is primary a foundational condition of being, space, subjects, and power (Sheller 2018 p. 9) allows us to investigate complex social and territorial phenomena through a multiscalar and complex vision.

Mobilities, moreover, are conceivable as constellations of movement, meaning and practices (Cresswell, 2006).

> Building on key insights from previous practice-theoretical investigations of everyday mobility (Shove, Pantzar, and Watson 2012; Greene and Rau 2016), we argue that an explicit focus on the collective (re-)production of social-material mobility practices can help social-scientific mobility research to move beyond unnecessarily narrow, individualistic interpretations of household mobility. This demonstrates the centrality of social relations in the constitution of everyday mobility practices.

The reproduction of mobility practices, and of social practices more generally, is deeply related to the reproduction of social relations. As deeply argued by the new mobility turn (Urry 2007), by the practice-theoretical framework approach (Shove, Pantzar, and Watson 2012), but also by the mobile ontologies approaches, social relations structure (mobility) practices and, in turn, are structured by them.

As summarized by Rau and Sattlegger (2018 p. 1) *practice-theoretical mobility research* focuses on the dynamic nature of collectively (re)produced mobility practices, paying particular attention to their constitutive social and material elements.

Practices, in this sense, are defined as «routinised types of behaviors that are both reproduced and changed through their everyday enactment by people, or 'practitioners' at different levels of social organisation, including societies, institutions and households» (ibidem p.4). Practices more over can be understood and consist in three intervened elements; meanings, "that reflects the norms and values in society that regulate the mental and bodily activities of its members" but also competences such as background knowledge and skills but also the material side of things, in the case of mobility practices clearly this is derived by the interaction between people and the built environment, infrastructures, objects and equipment (Shove, Pantzar, and Watson 2012; Heisserer and Rau 2015; Rau and Sattlegger, 2018) .
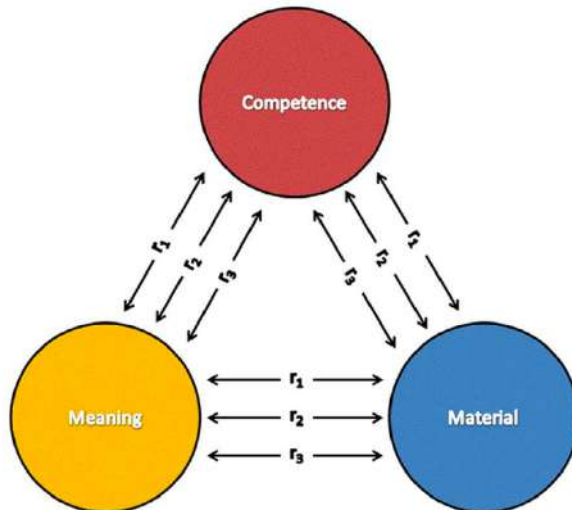
Graph 2: Relations as connectors between the three elements of practices (r1 = individual relations, r2= relations between individuals and societal organizations and institutions, r3= human – environment relations) Source: Rau and Sattlegger 2018

A large stream of literature that share the same mobility approach/ that follows the NMP focuses more specifically on the reproduction of mobility related inequalities. Indeed, this type of approach allows to look clearly at *uneven* mobilities: in the words of Mimi Sheller (2018 p. 12).

> Mobility in this view is organized through specific constellations of uneven mobilities that may include transportation for daily commuting, migration, tourism, educational travel, medical travel, temporary work, smuggling, asylum seeking, military deployment, emergency evacuation, humanitarian travel, and many other kinds of human mobilities (and in many cases these overlap and occur at one and the same time). It also engages many non-human mobilities, including all kinds of logistical systems and infrastructures for the movement of things, plants, animals, weather, water, energy, and their relation to the movement of the Earth itself. And this complexity allows the field to intervene in many different disciplines and policy arenas.

A crucial point, indeed, that Sheller (2018) proceeds, not all people have the same capacities and potentials for movement. Kaufmann (2004) defined mobility potential in terms of motility, defined as 'the manner in which an individual or group appropriates the field of possibilities relative to movement and uses them'. Motility depends on what is called 'network capital' as a combination of the capacity

to be mobile. This is an infrastructural fact, as mentioned above, but also a political one (think of the migratory, economic, cultural etc. field).

> Network capital is a combination of capacities to be mobile. It includes having appropriate documents, such as passports and visas, along with money (financial capital) and qualifications such as education or professional standing (cultural capital). Having physical capacities for movement, such as shoes, appropriate clothing, good nutrition, and an environment that fits one's body, as well as vehicles and infrastructures. It also involves access to networks at-a-distance (social capital, meaning the ability to access family relations, bank accounts, or co-workers through communication devices, to find location-free information using Wi-Fi hot spots, and to have quiet and secure meeting places, as well as time and other resources for coordination.

These capacities and forms of capital are unevenly distributed, producing and giving rise to many different forms of 'immobility'. This is a vast and widely explored topic in the literature that brings us closer to the subject of our research.

2.7 TOWARDS ACCESSIBILITY: METRIC OF SOCIO TERRITORIAL INEQUALITIES RELATED TO MOBILITY AND PROXIMITY

> Accessibility is fundamentally about the life opportunities open to people.
>
> (Farrington and Farrington 2005 p. 10)

The production of inequalities and more generally of mobility-related immobility has been the subject of profound analysis in the literature, a nexus with respect to which multiple approaches have opened up many questions and analytical interpretations. The tendency to equate accessibility entirely with mobility, and hence with transport, is a risk widespread in literature and in the public use of the related notions (Farrington and Farrington 2005).

Transport can be conceived of as an individual, collective, private, fast, slow means of practicing a mobility strategy: in other words, tools that enable a mobility potential to be put into practice in order to *access* and reach *opportunities*.

However, not only transport takes the form of an 'accessibility' strategy: walking, cycling but also proximity itself (Daconto 2017). Mobility infrastructures and mobility, as mentioned, are simultaneously configured as possibilities of access and exclusion from citizenship rights: they are

indispensable conditions of access to goods and services, a key factor of social and territorial integration (Colleoni 2009), but at the same time a vector and a way of reproducing inequalities.

In this sense, the notion of accessibility has been widely discussed (Kenyon et al 2002; Geurs and van Wee 2004; Farrington and Farrington 2005; Pereira et al 2017) and placed at the centre of the debate regarding the production of inequalities contextual to mobility.

Accessibility has been defined as an *umbrella term*, from the possibilities yet slippery and sometimes difficult to define and measure. Accessibility can, indeed, encompass different aspects: economic, social and spatial accessibility and it is a concept that lives across multiple sectors and disciplines. Accessibility can be regarded as a relationship, a property or a capability. Specifically, accessibility denotes the potential of an individual to achieve activities that are important for daily life and well-being. In other words, accessibility refers to the possibility and ability of individuals and social groups to reach and enjoy opportunities such as services, goods, activities, and encounters that allow actors to satisfy not only elementary needs, but also the more complex needs associated with the needs for identity, relationships, and participation present in the city (Dijst and Kwan 2005).

What is crucially argued in literature (Farrington and Farrington 2005 p. 2) is that

> Greater social justice cannot be achieved without greater social inclusion, which requires that people have access to a range of activities regarded as typical of their society; greater social inclusion requires greater accessibility which often (but emphatically not inevitably) implies mobility and transport use. This is not to say, of course, that social inclusion of itself achieves greater social justice, and particularly it is not to say that accessibility of itself achieves social inclusion.

Moreover, according to Cass Shove and Urry (2005) *access* indicates «the ability to negotiate space and time so as to accomplish practices and maintain relations that people take to be necessary for normal social participation». As mentioned by Farrington and Farrington (2005 p. 5) «participation in society is therefore taken to mean the ability to engage in a range of activities typical of Western society. It must be emphasized that opportunity to engage recognizes the validity of personal and collective choice. Individuals and groups may choose not to engage with a normal range of activities, and they have that right».

Moreover, accessibility can be considered a social indicator, a necessary but not sufficient condition for improving well-being and quality of life, inclusion, and social justice. In this way, accessibility is delineated as a spatial dimension that helps to measure and visualize the levels of inclusiveness or social exclusion present in a given context. As mentioned in literature, the quantification of

accessibility levels by measuring the opportunities available to defined people living in defined locations, and their ability to reach them by transport or other means (at a cost of time, money or other constraint), give a general and crucial attempt to highlight the different levels of territorial opportunities, nevertheless, inevitably, it involves value judgements about people's accessibility desires (Farrington and Farrington 2005).

In other words, accessibility is not a sufficient condition for social inclusion and social justice, but it is a necessary one. As argued, it cannot be universally or totally achieved and some level of unfairness is inescapable, and those who seek to achieve greater equity, fairness and justice can at best seek to minimize such inequalities'' (Hay 1995, p. 505). Recognising the location of social exclusion in geographical space automatically means recognising such constraints but does not reduce the social and moral value of seeking to minimise these inequalities.

Contemporary accessibility is conceivable as a planning tool and on the other hand *greater accessibility* is a goal. Both nuances of the notion work together in the definition of the overall concept of accessibility. Both are potentially powerful drivers of policy because they require that policy sectors interact, otherwise the goal of achieving greater accessibility as a means of greater social inclusion and social justice cannot be fully attained. The aim of inserting the new narrative of accessibility into policy-making—or, even better, to incorporate it as a basis for policy-makingis to bring about, or develop existing, integration between sectoral policies (Farrington and Farrington 2005).

At the same time, accessibility can be read as a relationship between individual, environmental and transport system characteristics, which means considering individual and context-based needs.
Moreover, accessibility can also be read as a relationship between the needs, desires, and requirements of each individual as part of a society and the infrastructure, service offer, and presence of opportunities.

Proximity, moreover, is a concept that has gained momentum today and plays a crucial role in the definition of livability and as a means to reach opportunities. Proximity itself can be seen as a mobility strategy, a way for people to access spatially distributed opportunities and goods. Improving accessibility in terms of proximity (Lanza Pucci Carboni 2023) can improve social inclusion and equality and more generally the quality of life.
In this sense, the emphasis on proximity as a mobility strategy has enabled a kind of *paradigm shifts* in the urban development thinking. From a conception of urbanization planning based on transport

and speed constantly increasing main attention has given to strategies based on proximity through densification and redevelopment. Examples in this sense are represented by the spread of the chrono – urbanism   policies inspired by the well-known 15 minutes city idea (ville du *quart d'heure*) (Moreno et al 2021).

This has led the long-term debate among mobility and accessibility studies towards defining the basic needs and opportunities to be reached by proximity, how to define the group of basic and fundamental services that are located in a defined catchment area. In this sense, the infrastructure is not just the mean of reaching the opportunities and services, but the infrastructure itself is the dimension to be reached, the network of well-being towards which to have as little friction as possible.

2.8 SUMMARY OF THE CHAPTER

This chapter explores the crucial role of infrastructures, particularly mobility infrastructures, in shaping territorial transformations. Infrastructures are analyzed not merely as physical entities providing material or immaterial services but as fundamental systems enabling citizen rights and societal functioning. The chapter delves into the long-standing debate on the relationship between infrastructure and territorial landscapes, highlighting how mobility infrastructures like roads and railways historically transformed cities and regions, influencing both urbanization and territorial hierarchies. In Social Sciences, the concept of infrastructure is interpreted through interdisciplinary lenses, merging several approaches (2.1.2). Indeed, the chapter emphasizes the need to transcend traditional definitions of infrastructure as merely material artifacts or mobility networks but it adopts a broader view where infrastructures serve as mediators of social integration, as well as vectors of inequality, shaping access to essential services This section introduces foundational economics approach to frame infrastructures as critical for daily life, particularly focusing on mobility systems within a wider framework of interconnected infrastructural services, including logistics, welfare, and digital networks.

Moreover, the chapter explores the definition of infrastructure as socio-technical systems, essential to the flow of people, goods, energy, and information (2.1.3). The "infrastructural turn" that regard literature in last decades challenges views of infrastructure as neutral and static, instead portraying it as deeply political and influential in territorial governance. Indeed, it touches on the importance of visibility and how infrastructure is often unseen until it fails, underlining the connection between infrastructures and modernity, politics, and power.

The chapter emphasizes how infrastructures are deeply intertwined with modernity, not only in material terms but also in shaping cultural and social narratives. In this sense, the *symbolism* of infrastructures is also relevant since they represent progress while simultaneously evoking fear and failure being emblematic of both development and the collapse of historical societal structures. Finally, infrastructures also carry affective and emotional investments, embodying collective aspirations, identity, and societal belonging. From the territorial point of view, mobility infrastructures, particularly railways, have historically played a critical role in reshaping territorial landscapes. Mobility systems are presented as more than just means of transportation; they are described as producers of spatial and temporal categories, influencing social practices and territorial relations. Besides, historically, infrastructural development have been pivotal in the transformation of European cities. The chapter traces the influence of industrialization and the revolutions of the 18th century on urban growth and infrastructural development, noting that railways, in particular, catalyzed the spatial expansion and reorganization of cities. The infrastructural developments of the 19th century marked a profound shift from "walking cities" to "transit cities," accelerating urbanization and influencing both the material and symbolic fabric of modern cities (2.2.2). The chapter (2.2.3) also discusses the varying scales of infrastructural projects and how these interact with local and global dimensions. It examines how large-scale projects, such as high-speed rail systems, often create conflicts between different actors, scales, and rationalities. Chapter 2.6 introduces within a broader complex system, encompassing infrastructure, technologies, policies, and the practices and demands of individuals and societies. As argued, focusing only on infrastructure is not enough for understanding territorial transformations, and a broader look at mobility practices, accessibility, and their impact on social inequalities is necessary. The concept of mobility is seen as multidimensional, involving not only the physical movement of people and goods but also the socio-political dimensions of accessibility and exclusion that are explored in the last paragraph of the chapter (2.7).

CHAPTER 3

INTERMEDIATE/ IN – BETWEEN ITALY BETWEEN HIERARCHIES AND POLICENTRISM

READING THE TERRITORIAL TRANSFORMATIONS FROM THE MIDDLE

3 TERRITORIAL TRANSFORMATIONS

> Quelle frasi sono il nostro latino, il vocabolario dei nostri giorni andati, sono come i geroglifici degli egiziani o degli assiro-babilonesi, testimonianza di un nucleo vitale che ha cessato di esistere, ma che sopravvive nei suoi testi, salvati dalla furia delle acque, dalla corrosione del tempo. Quelle frasi sono il fondamento della nostra unità familiare, che sussisterà finché saremo al mondo, ricreandosi e resuscitando nei punti piú diversi della terra, quando uno di noi dirà — egregio signor Lippman — e subito risuonerà al nostro orecchio la voce impaziente di mio padre: "Finitela con questa storia! L'ho sentita già tante di quelle volte!"[2]

With the aim of framing the dynamics of territorial transformation through infrastructural and mobility processes, this chapter introduces some preliminary theoretical elements around the notion of territory, territorial dynamics and the reasons behind the choice of this label over others (i.e., urban). Some conceptualizations of this very broad notion will be reviewed, which will help to frame and theoretically the vocation of the research. In addition, some ideas will be presented to circumscribe the theme of territorial transformation and its various spatial and temporal geometries. In turn, territorial transformations mobilize one of the central themes of the research concerning the production of centralities and the processes of hierarchization of space, with the consequent risks of socio-territorial inequalities. These topics have a considerable history within the *territorial* disciplines and some elements reported here allow to read the processes in the study of *intermediate* areas.

Two main approaches are prevalent in literature, from one side it is highlighted how the processes of territorial transformation simultaneously risks - albeit not as a deterministic consequence - to arise to processes of territorial hierarchization, through infrastructuralisation itself. On the other hand, the hierarchical approach to territorial transformation has been flanked by the reticular model according

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[2] N. Ginzburg, Lessico famigliare, Torino, Einaudi, 1963

to which the relationships between cities and territories are *systematically* integrated and regulated by processes of complementarity.

Second part of the chapter give a portrait of the territorial transformation processes in Italy and reviews different relevant ways of reading territorial diversity through the several geographies, morphologies, taxonomies, and clustering discussed in recent literature.

First two parts of the chapter allow to introduce the relevance of *intermediate areas* in Italy that constitute the last and crucial part of this chapter.

This is devoted to framing the notion of intermediate areas within the literature. The expression 'intermediate areas' is, in fact, relatively young within the lexicon of spatial sciences and needs further investigation. To do this we will otherwise look at the so-called intermediate areas from the point of view of territorial morphology but also in the dynamic terms of processualism, transformation and ongoing metropolitanisation/urbanization.

This will provide a theoretical basis for the empirical investigation of the dynamics taking place in the context of intermediate areas also - but not only - in terms of the processes of "infragilisation" and marginalization and how these processes pass through infrastructure and mobility in material and symbolic ways.

From this perspective, is possible to frame the central role that the complex and entrenched network of medium-small cities has played in the European context. Medium-small cities have formed the skeleton of the European urban landscape and its historical configuration (Bagnasco and Le Gales 2001), and in this sense it can be said that Europe "is a land of ancient medium and small cities, Italy being a particularly significant piece of it" (Trigilia 2014).

For these reasons briefly highlighted, an interest in looking at processes of spatial transformation from the definition of an intermediate level is outlined in the research.

In addition to this, it becomes clear how, in the European context, the processes of urbanization and suburbanization are linked to this network of socio-territorial pre-existences with which they con - fuse. Suburbanization, peri-urbanization are not only the process of overflow of the big cities out of its "boundaries" as can happen in non-European continents in continents, characterized by the presence of a few very large cities surrounded by wide intermediate and successively inner (rural or mountainous) areas. In European and Italian context specifically the process of urbanization is the result of a more complex relationship in which medium-small cities and pre-existences are a relevant actor.

Last part of this chapter is focused on answers the questions regard mobility dynamics in *intermediate areas* and how have been differently encompass by different bodies of literature. Indeed, it is here

highlighted the lack of systematization on the knot between intermediate areas, infrastructure and mobility, since the issue have been pursued with different gazes and sometimes overlapping labels.

3.1 Disciplinary trajectories and meanings of the concept of *territory*

> Amazingly little has been published about the concept of territory, although much speech, ink, and blood have been spilled over territorial disputes.
>
> Gottmann 1973 p. ix

The need for the use of the notion of "territorial" within the dissertation derives from the need already long emphasised in the literature to "compose urban and rural issues in an integrated vision" (Demarchi 1974 p. 7). Given the composite definition of the scenarios analysed by the thesis, the aid of the concept of "territorial" can be useful in overcoming the long-discussed (Carrosio and Landi 2023) dichotomy between urban and rural now overcome by blurred administrative boundaries in functions and practices. The appeal of territory as an operative and analytical tool allows an overall view of the spatial continuity of places regardless of the analytical reference taken into consideration from time to time. Territory is thus configured as a figure that is as abstract as it is inclusive of the multiplicity of images relating to places.

However, this notion must be taken with caution and requires some clarification that the following pages will provide.

The word territory, in fact, has undergone different semantic trajectories from different traditions and disciplinary perspectives. Not only, indeed, within different national traditions this concept has taken on different theoretical meanings such that the use of 'territorial' in certain international scientific contexts can be slippery and the adjective urban would be more appropriate.

The notion of territory adapts to time and space, in relation to local 'traditions'. It changes in different epochs, within different national and international disciplinary literatures.

In Italy, especially in the Social Sciences, the concept of territory has remained more detached from a geopolitical meaning linked to the political-spatial category, maintaining a "broader" meaning of which the following section will briefly trace a picture.

This trajectory is intertwined with several processes. On the one hand, it calls into question the issue of hegemonies and disciplinary dialogues that have traversed the notion of territory on a local scale. The role and conceptions around the territory that regional studies (i.e. Camagni) and more generally geographical studies (i.e. the work of De Matteis) have played in the national scientific panorama, which in Italy have perhaps maintained a vocation as a whole oriented towards the study of the territory in conjunction with other important traditions linked to planning and, indeed, sociology (i.e. Bagnasco). Linked to disciplinary dynamics, reproduced on a smaller scale are the issues of urbanization processes and, lastly, the different national resonance (and application) of major international debates.

Mela (2015) emphasizes how the use of the concept of territory within sociology that is interested in spatial phenomena becomes a complex issue, first and foremost in discerning a common thread within the discipline of the sociology of territory itself, and even more so when considered in relation to other disciplines that pose convergent questions towards the territory.

The concept of territory in fact viewed through this international and multidiscplinary prism becomes more complicated, «it becomes even more abstract and open to multi-scalar references: what is more, it is already laden with references to non-sociological traditions (in particular geographical and urban planning) which in turn do not offer an at all unambiguous definition» (Governa 2014).

Mela (2015; 2018) argues how the difficulty in defining territory and urban and their conceptual relationship is reachable in the broader debate around the "question of the identity of sociology dealing with territory" searching for a *red thread* connecting the various fields of interest of the sociology of territory, configuring its identity (Mela 2015 p. 12) and what can turn it recognizable.

To address the question of the *identity* of a sociology dealing with territory, three preliminary reflections are invoked. The first configures territory as the container of elements useful for sociological analysis, the literal space within which data are collected. Second, territory configures the geographical limits of hypotheses and theories of phenomena. Thirdly, territory is configured as the proper determinant of the location of certain phenomena.

> Se si intende trovare un denominatore comune a queste forme di evocazione del territorio - cui ovviamente se ne potrebbero aggiungere altre - esso sta nel fatto che, in ciascuna di esse, lo spazio è richiamato come **puro contenitore di elementi utili all'analisi sociologica** (in quanto deposito di oggetti da cui ricavare evidenze empiriche, o di anomalie interpretabili nel momento in cui serve farlo), ma non come vero e proprio protagonista, o quanto meno co-protagonista, dello studio. Gli elementi spaziali, esplicitamente o implicitamente evocati, hanno in ogni caso un **ruolo accessorio**,

Those just highlighted are ways through which the territory can be evoked by sociology, although they do not exhaust the question of the specific identity of the sociology of the territory. In this sense, if these evoke the territory in sociology, the affirmation of a sociology of the territory goes through three moments and connection modalities to present a specific perspective that cannot be traced back to other Sociologies.

The *territorialist* perspectives of sociological analysis can be situated along a continuum line from *precondition* towards *outcome* via *medium.*

In other words, first, the territory is configured as *the generative context of social action* (Mela 2015), this means that the territory is not a frame within which the phenomenon studied takes place but owns an active role and it is configured as an active presupposition to the genesis of actions. (whose role of the researcher lies in making it explicit).

Secondly, the territory is understood as the *product of a social construction*, it isn't configured as an active presupposition to the genesis of social structures but as the *outcome of a process of interaction between social and spatial variables.*

Lastly, the territory is configured as a medium through which a multiplicity of actors converges in the definition of urban policies or governance processes, or otherwise it is the ground of clash between discordant practices.

Following table summarizes the different approaches that define the specific role of territory in defining a *sociology of territory* "separated" from other Sociologies.

TERRITORY AS PRECONDITION:	TERRITORY AS *MEDIUM* :	TERRITORY AS OUTCOME:
GENERATIVE CONTEXT OF SOCIAL ACTION AND PHENOMENA	EMPHASISES ON THE WAY ACTORS INTERACT THROUGH SPACE VARIABLES	PRODUCT OF A SOCIAL CONSTRUCTION (WHICH INCLUDES ITS DECONSTRUCTION)
ACTIVE PRECONDITION TO THE EMERGENCE OF ACTIONS	ATTENTION TO THE PATHWAYS THROUGH WHICH A SOCIAL PHENOMENON EMERGES, DEVELOPS AND EVENTUALLY DECLINES	OUTCOME OF THE INTERACTION PROCESS BETWEEN SOCIAL AND SPATIAL VARIABLES
ACTIVE INTERACTION	THE TERRITORY AS MEDIUM THROUGH WHICH A PLURALITY OF ACTORS CONVEY IN THE DEFINITION OF URBAN POLICY OR AS A GROUND BETWEEN CONFLICTING PRACTICES	COMPETITIVE, COOPERATIVE, CONFLICTUAL RELATIONSHIP
RELATION BETWEEN TERRITORY AND TERRITORIAL SOCIOLOGY		
RELEVANT THEORETICAL PARADIGMS:		
a) Complexity theories and about co-evolution between social systems and ecosystems (Gual, Norgaard, 2010),	a) Chicago School	a) Theories of the cycle of spatial transformations (territorialisation, deterritorialisation, reterritorialisation) i.e. Raffstein (1980; 2012; Turco, 1988) and Battaglini (2014)
b) Socio-ecological system concept (Brondizio, Ostrom, Young 2012)	b) Practices Studies (Schatzi, Knorr Cetina, Von Savigny, 2001)	
c) Developments in neo-Marxist thought, culturalist approaches that emphasise the processes of stratification of meanings in space as a precondition for social action,		
d) Bruno Latour Actor- network theory, the role of *actants* in defining practices for the use of public spaces (Kärrholm 2007).	c) Symbolic and linguistic analysis of space	

Table 4: Insights about the relation between territory and sociology of territory (Own elaboration on Mela 2015)

This regards more explicitly the Italian disciplinary context and what it is placed behind the expression *sociology of territory* (sociologia del territorio) in which this work aims to place. Other important references also about the relation between the Italian and the international debate about the *statute* of urban and territorial sociology can be find in the well-known debate among Zukin (2011), Martinotti (2011) , Harding and Blokland (2011), Fainstein (2011) appeared on the pages of the Sociologica journal.

3.1.1 Territory concept in the international context. A gaze towards international literature

The territory from bounded space to process

While in 'Italian' literature the attribute territory has sometimes allowed, especially through the eyes of Social Sciences, a 'generic' synthesis between the urban and rural variables, in the international scientific arena, the term territory more explicitly evokes resonances of a geopolitical nature akin to the meanings of state and sovereignty that have historically connoted the notion of territory.

The notion of territory has been extensively investigated by geographers, most notably Gottman (1973; 1975) and later Elden (2013; 2019).

Depending on the audience, territory can mean many things, as argued by Elder (2013 p. 66) in the review of Gottman work:

> To politicians, territory means the population and the resources therein, and sometimes also the point of honor of Irredentist claims.
> To the military, territory is topographic features conditioning tactical and strategic considerations as well as distance or space to be played with; occasionally it is also resources in terms of local supplies.
> To the jurist, territory is jurisdiction and delimitation; to the specialist in international law it is both an attribute and the spatial extent of sovereignty.
> To the geographer, it is the portion of space enclosed by boundary lines, the location and internal characteristics of which are to be described and explained.
> To the specialist interested in political geography, and I happen to be one, territory appears as a material, spatial notion establishing essential links between politics, people, and the natural setting.
> Under a purely analytical approach, the notion of territory would break up and dissolve into a multitude of different concepts such as location, natural resources, population density, settlement patterns, modes of life, and so forth. The important aspect of territory as the unit in the political organization of space that defines, at least for a time, the relationships between the community and its habitat on one hand, and between the community and its neighbors on the other, has been little explored (1973:ix).

Gottman highlights in this quotation the complex semantics behind the notion of *territory*. Several field can be concentrated inside it: population, natural resources, but also emotive attachments; it can be conceived as terrain. It conveys also legal meanings inherently intertwined with jurisdiction and sovereignty; it is a portion of bounded space, ready to be located and catalogued; it links politics, people, and the environment.

Territory as geopolitical category

Starting from what has just been mentioned, this section will give a concise account of the notion of territory in the international context.

Historically and internationally, the notion of territory carries within it a vocation more explicitly *geopolitical* and intrinsically linked to the concepts of *state* and *sovereignty*. However, more generally with the processes of globalization, the concept of territory has migrated towards a economic and cultural definitions. The value of 'territory' is gradually reduced towards a theme of spatial organization moving from *states* to *people*, as a concept used to pursue the well-being of the people who occupy it (necessary to preserve the freedom and variety of communities, separated into an independent and accessible space.)

Territory: from bounded space to process

The most commonly used definition in the international field frames territory as *bounded space*: a space under the control of a group of people, i.e. a state.

The early literature conceives of territory as the outcome of *territoriality* to be understood in these terms: territoriality is not to be considered exclusively as an adjectivization of territory (i.e. space and spatial) but between territory and territoriality there is a process of creation, action, maintenance, control. In these terms, the literature speaks of territory as the outcome of territoriality. Nevertheless, according to Elden (2013) this is not enough. He proposes to disentangle the notion of territory from the territorial and to regrasp the specificity of territory itself.

One way of conceiving the relationship between urban and territorial refers to a first set of meanings that takes a view of the territory as bounded space: in this first sense urban is a discrete area within the nation state. On the other hand, there is a conception of urban as a territory, as a bounded and discrete area. A third approach conceives of territory within the urban by referring to discrete areas that have been territorialized such as districts, neighborhoods: territory within the urban. Both these

conceptualizations presuppose territories as bounded space with a view of territory as a container, more or less urbanized depending on the area.

This view had already been extensively discussed in the work of Brenner and Smidth (2014; 2015) who question the model of urban as a container by thinking of urbanisation as a gradient where places are located within a continuum between non-urban and fully urban.

While the literature sees territory as the outcome of the process of territoriality, how does the process of territory creation work? Territorialities derive from the individual behaviors, actions directed towards dwellings, mobility (commuting) and the use of public spaces. But also, the process of territorialization of urban space goes through the creation of bounded spaces through markers given by collective groups that territorialize and give meanings to urban space.

Many of these interpretations help to see much of the territorial interpretation but clearly do not exhaust all the possibilities.

Largely expressed in the literature to read the relationship between urban and territorial (and to read the territorial tout court) are three main variables: 1. political-economic, 2. geopolitics, 3. legal.

From the point of view of the political-economic perspective of the notion, reference is made to conceptions that see the territory as a bounded, discrete area that can be monetized, compete (territorial rent, territorial competitiveness): in this sense an a-critical use of the territory is configured in which the notion of territory is confused with that of land (territory > land) and more generally there is the risk of reducing a spatial category to an exclusively economic one instead of recognizing within the notion of territory a complex geo-economic demand.

The second perspective highlights how the politics of space is not reduced exclusively to political economy but equally concerns other aspects of political control that can be summarized in terms of political strategic. This aspect includes, for instance, war making where territory is a *bounded space* contested, conflicted, controlled. Although the strategic and territorial control apparatus does not coincide exclusively with a notion of territory as a state, but it can be applied to other contexts ie. Urban-territorial segregation, territorial stigmatization (Wacquant 2007) or social movements (grassroots politics, Lefebvre 1975). This perspective on the notion of territory also concerns aspects more explicitly related to territorial control and the division into discrete territorial zones functional to the administration, justice, and legal framework of the state *tout court*. This brings us closer to the third and last possible reading of territory proposed by the literature, which makes itself in more explicitly political legal terms. In fact, political and economic issues are located within a larger legal

framework that includes: 1. territorial government, 2. territorial regulation, 3. regulatory practices. In this sense, the legal framework within which processes (i.e., economic) occur is that of the state that allows for the political legal framework and institutional support to the working of the market in terms of regulation.

These three prevailing approaches to the notion of territory as bounded space, however, do not exhaust its semantic possibilities: in this sense, strategic political concerns such as geographic location, infrastructure and networks (e.g. Brenner's implosion/explosion and Smith's uneven development (1984/ 2010) also contribute to the definition of territory and the relationship with the urban.

However, Elden (2013; 2019) thoroughly investigating the conception of territory as bounded space and the consequences that this entails, points out how (also based on Brenner's reasoning linked to Lefebvre's thought), territory is continuously produced and reproduced in processual terms.

There is no act of creation in terms of containers, but rather a continuous transformation. This process is shaped and contained (limited) by the social relations within which states configure themselves as political actors, but also by inheritances from the past.

The territory can thus under certain conditions have the characteristics of bounded - ness and exclusiveness but these are not sufficient categories for its full definition.

In this sense, it is possible to overcome the conception of territory as bounded, static, and defined, towards a conception of territory configured as a *process,* in continuous transformation, produced and reproduced (made and remade).

Territory can at certain times and in certain places, take on the characteristic of bounded-ness and exclusiveness, but these latter categories are not sufficient to define it (Elden 2019 p.8).

It therefore becomes crucial to think of territory as a process and to break with a static and defined, delimited conception of territory. Territory is not configured in terms of the result of the process of territorialization but as the process itself, as something constantly being reproduced, constantly being made and remade.

The conception of territory as a process is also widespread in Magnaghi (2020; 2010), proponent of the so-called territorialist approach. In this case too, territory is defined as a dynamic and continuous process, configuring itself in the terms of:

> prodotto storico dei processi di coevoluzione di lunga durata fra insediamento umano e ambiente, natura e cultura e cine esito della

> trasformazione dell'ambiente a opera di successivi e stratificati cicli di civilizzazione.

From this, the territory is treated as a highly complex living organism: an ecosystem in continuous transformation, produced by the encounter between cultural events and nature, composed of places endowed with identity, history, character, and long-term structure, which form the territorial and urban types and individualities.

Many terms and expressions resemble and partially overlap in the explanations of territory as processuality, from Corboz's (1985) much-cited palimpsest to *artwork* (Magnaghi, 2020), to *historical construct*.
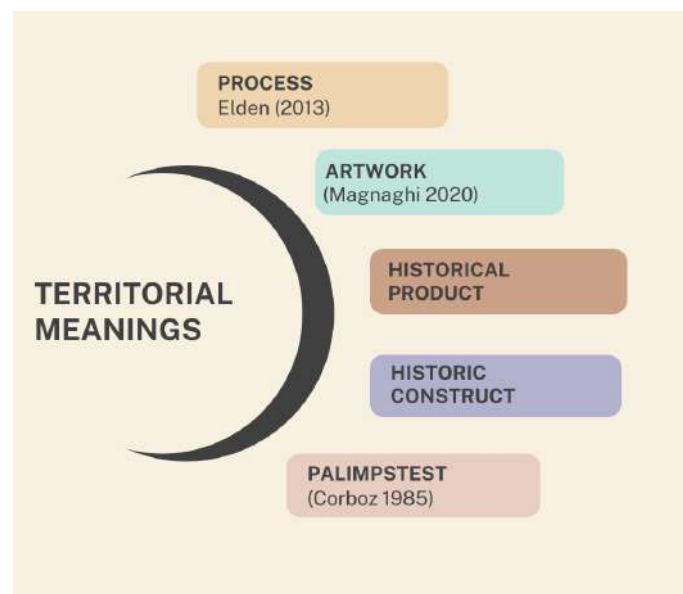

Figure 4: Author elaboration on Magnaghi (2020), Elden (2013), Corboz (1985)

Indeed, the temporal dimension in the definition of territory plays a crucial role: indeed, has largely analyzed in literature, especially in the European context, it becomes clear how the territory is configured as a «historical product», a palimpsest (Corboz 1985) that can never be reduced to a single unit, but it is crossed and innervated by underlying dynamics, delineated by more or less visible «monuments» that (are) witness of a geography of centrality and marginality, shaped by time and history.

Magnaghi (2020) also referred to the territory as a 'work of art', produced through the dialogue and relationship between living entities, man and nature, within the longtime of history, as a choral, co-evolutive work that grows over time.

In other words (Bianchi – Poleggi 1987 p. 7):

La città intesa come ambiente e strumento di vita è un processo estremamente dinamico di cui non soltanto gli ingredienti umani segnano ritmo e qualità di risultati sempre diversi e instabili, ma dove gli effetti materiali di fasi precedenti continuano a pesare - anche se con significati mutati quelle successive, formando uno spessore complesso di elementi diacronici che complicano la stessa esposizione concettuale e verbale.

In the words of Dematteis (2014), the territory is configured as a 'historical construct', understood within a complex, diachronic and integrated meaning of physical, built and human environment.

3.1.2 Territorial transformations and memories

The processual and transformative dimension is thus configured as an intrinsic characteristic of the territory itself, in other words, the notion of territory conveys the vitality of a transformation in continuous becoming at different speeds and geometries. The character of intrinsic transformation of the territorial depth leads to more or less constant and more or less evident reassessments of the physical and material space in which we move.

Territorial transformations, especially the more or less accelerated transformations of the urban form, also correspond to 'new reading codes corresponding to a changed way of being of its inhabitants' (Bianchi and Poleggi 1987) of local and extra-local the dominant classes.

The history of the city and the territory has many linguistic registers and many levels of meaning: it can clearly be the history of architecture and settlement forms, of ways of inhabiting the territory, of the different techniques that have aided and conditioned its construction and modification, or as the history of its inhabitants, conflicts and cultures. An (un)told history of great visions, the sense and meanings that have substantiated materiality and representations of the territory (Secchi 2013).

Territorial transformations are marked by continuous processes of territorial construction, territorialisations also conceived as delimitation and designation, and processes of deterritorialisation. Territorial transformations are marked by more or less evident events, baptised by more or less explicit mythologies, continuous re-territorialisations.

Benevolo (1996) spoke of the European city as an instrument for travelling through time, an irreplaceable channel of communication between past and present. Urban and territorial permanences remain in time as anchors in history, where «we can deposit and put in common a part of memories too heavy to be carried by each individual» (Benevolo 1996 p. 4), scenography where the precarious balance between individual and collective memory is entrusted. Toponyms, in this sense, constitute a geographical source of stories from the past of the city and the territory that is often neglected by today's urban and territorial studies.

As De Certeau (1990 p. 165, ed.it 2001) mentions:

> "Non c'è luogo che non sia ossessionato da molteplici fantasmi, avvolti nel silenzio e che si possono evocare o meno. Si abitano solo luoghi popolati da spettri, corrispondono ad un sapere che tace. Di ciò che è saputo ma taciuto, passano tra di noi solo delle allusioni"

Memory, understood as a synthesis of the space-time relationship, thus becomes a crucial variable, often underestimated, that conveys and allow to understand the territorial dynamics itself.

Urban transformations, urban redevelopments, the construction of new roads, the destruction and replacement of more or less extensive parts of the city bring with them different layers of memory, mourning, implicit and explicit public and private regret. The history of territorial transformation is thus traversed by the constant ambivalence of the need and desire for renewal on the one hand and instances of defense and preservation on the other: a defense that implies different, sometimes opposing, and conflicting rationalities as well as different capacities for voice and agency on the part of the protagonists. This is the case if, for example, we talk about the conservation of cultural heritage, but also if we look at the processes of gentrification and urban regeneration.

In this direction, neighborhood melancholy itself is a debated subject in urban studies looking at spatial transformations (i.e. in the form of gentrification processes) (Frank 2021). The notion of melancholy as a lens of spatial transformation is used in literature (Eng and Kazanjian 2002) as «as a mental state incorporating the individual and the collective, the spiritual and the material, the emotional and the social, the aesthetic and the political». Neighborhood melancholy is thus a collective reaction to unresolved and inchoate loss and mourning and in this view, the melancholic mood appears to be a "form of resistance" against forgetting.

As a living relation, the territory is thus a subject that remembers and is remembered: a rooted territory is a territory that is re-born from the constant renegotiation between the present and the future of its inhabitants. And considering transformation as deterritorialisation, it can be understood as the extraction of the memory and biography of a territory (see i.e. hausmanization process and radical change, Milan changing face quickly and the erasure of memory, no longer feeling at home, the melancholy for what is no longer there)

In other words, Magnaghi highlights how if on the one hand the territory is an object in constant vitality, on the other hand in contemporary society it risks absorption, objectification, becoming (only) a blank sheet of paper, with the dissolution of the city's symbolic and representational functions. As we have seen, what can scientifically be briefly summarized within the notion of deterritorialisation takes on the variables of memory as relevant.

Magnaghi (2010 p. 21) also traces deterritorialisation to the progressive liberation from territorial constraints and proximity, with the consequent risk of unawareness regarding the relations between the environment and human settlement and, indeed, an uprooting of the memory and biography of a territory.

To conclude, the territory is constantly undergoing transformation on a symbolic as much as a material level: infrastructures, projects and so on are the tangible sign that this transformation is taking place.

Territory, as seen, is not fixed, not given, but in constant redefinition, renegotiation, - it is intrinsically connected with the subjects and practices (De Certeau, 1990; ed.it 2001) that pass through it and by what passes through it, constitutes, innervates, illuminates, irrigates, etc., as is the case with infrastructures: inseparable parts of both the space and the "traverser" of the space within a "hybrid" form (Amin - Thrift 2017).

Spaces themselves move and travel, Urry and Sheller (2004, p. 6) suggest, are places of movement: Places are about relationships, about the placing of peoples, materials, images, and the systems of difference that they perform. In particular, places are located in relation to material environments and objects as well as to human meanings and interactions.

> Places are situated at different stages and locations within global flows - there are places that go 'with the flow' and those that are left 'behind' - and these designations, as we have seen, can rapidly change.

3.2 Territories among centralities, territorial hierarchies and polycentrism

3.2.1 Understanding territorial centralities: approaches of the hierarchical space

These latter questions explicitly pose the issue of the so-called *territorial centralities*. This is a long-discussed topic and this paragraph explore the main streams of thought about. First the paragraph wants to underline how the territorial centralities are historical products, secondly it will give a gaze on the well know *christallerian* approach on centralities and the influence that had in the following conceptions of territorial relations, especially in the Italian context. Nevertheless, the hierarchical approach left space to reticular interpretation of territory that the latter part of the paragraph will give an account.

In exploring the production of territorial connections and relations as this work is aimed to is non-negligible to look at these theorizations and to the influence that had in the following and contemporary territorial *classifications* and conceptions.

As historians especially teach us, these are the historical product of the long duration of different epochs, historical products that follow long paths.

From the center of religious power and their territorial ramifications: such as abbeys, monastic orders, religious roads and routes: roads of pilgrimage and devotion that left marks, marked and signaled the territory and slowly built it up. Thus, spatial centralities and related routes became intertwined with the threads of first religious then secular and secular power, strategies of war and peace, production, and economies within a complex relationship with physical morphology. Territorial and urban political, economic, and cultural centralities of the Western and Eurocentric world have delineated a continuous rewriting of the present.

If historians and scholars of the past and its artistic, architectural, and textual vestiges have investigated the very long-lasting relations of centralization processes and the products, traces and permanences in the contemporary, the sociology of the territory has the task of restoring the present of these material and immaterial relations in terms of social relations.

The monuments, the roads, the traces that have remained in space make the territory (Careri 2006) in the sense that they build a common cognitive map that allows orientation in space and time.

Different histories of different powers have thus, over time, given different names to places, defining them, simultaneously the practices of those places have negotiated, those names, making them a layer of that territorial palimpsest in constant rewriting. As stated, in fact, (Tomlinson, 1999 in Osti 2010) place symbols never disappear altogether but, if anything, they lose their role as a shared semantic referent, in other words, losing progressively their function as a spatial reference.
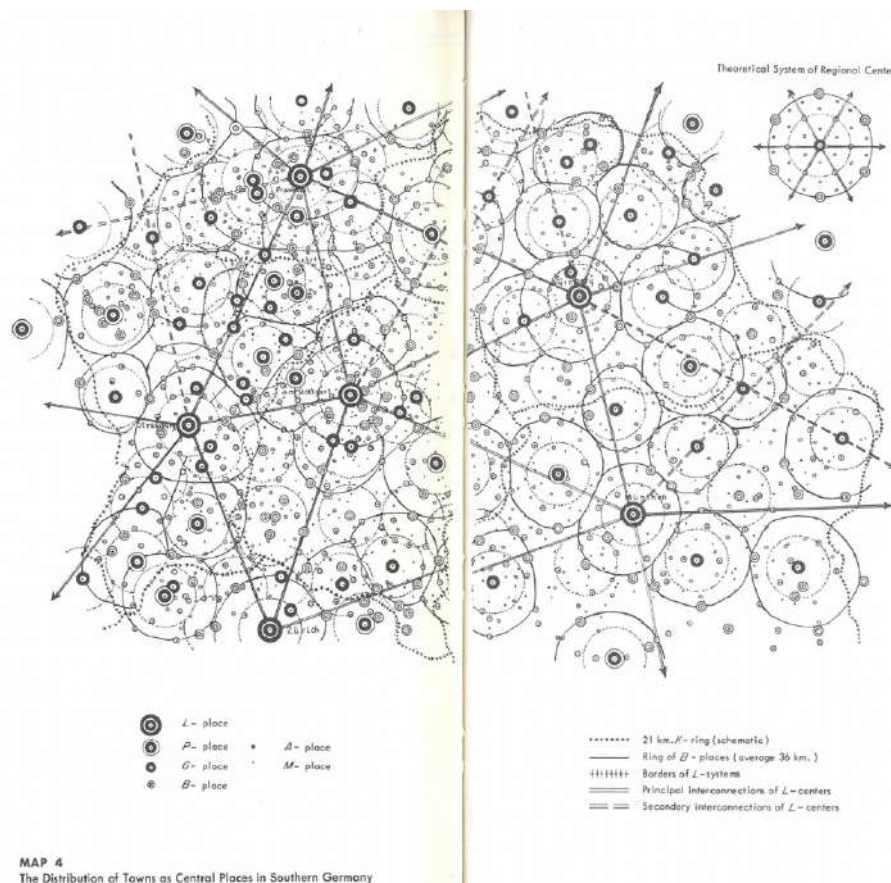
Centralities are one of the classic topics that has long interested scholars of space, giving them multiple interpretations. Concentration of religious and secular power, of relevant functions arising but also symbolic of space are intertwined in the landscape and across disciplines.
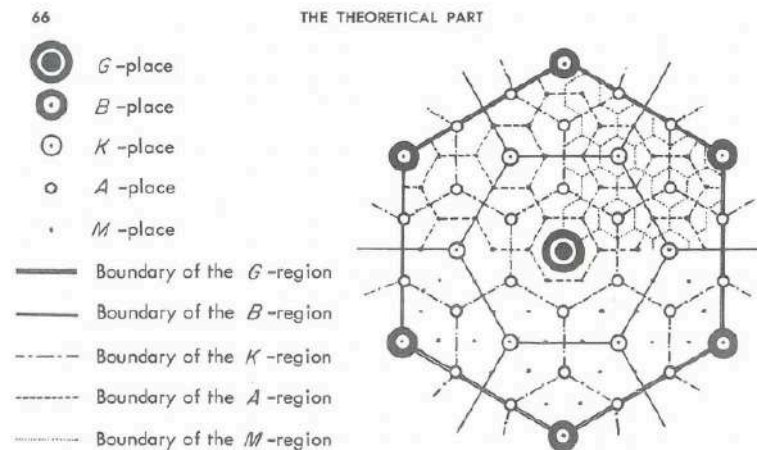
Symbolic concentration of power but also material: according to a functionalist approach, centrality is in fact defined in terms of the concentration of functions and services "of a certain level" and as the ability to coordinate these. With a fitting expression Bagnasco (2003 p. 73) summarizes as characteristic of central territorial systems «the systematic coordination of presence and absence».

While historically becoming a city primarily meant crossing a certain demographic threshold, the functionalist conception of the city interprets it as a «center capable of performing certain functions of a certain level in the areas of trade, credit, business services, administrative services and education» (Bartaletti 2006).

The Central Localities of Southern Germany by Christaller (1966) and the Italian interpretations

In the search for epistemologies of centrality, the celebrated work The Central Localities of Southern Germany (1966 , transl it 1980) by the economist and geographer Christaller has assumed crucial relevance for the study of spatial sciences. Christaller, seeking a general explanation that would answer questions about the forms and structure of hierarchical networks of centers, identifies "three laws" underlying the size, number, and distribution of cities: the administrative, the traffic and the market principle. Therefore, the structure of cities would be summarized by a *seven-level* hierarchy around which a hexagonal area of attraction is formed, with lower-order localities on the vertices or in the middle of the sides of the hexagon.

MAP 4
The Distribution of Towns as Central Places in Southern Germany

Box 1:The Central Localities of Southern Germany by Christaller (1966) and the Italian interpretations

66   THE THEORETICAL PART

⊙ G –place
⊙ B –place
⊙ K –place
o A –place
· M –place
━━━━ Boundary of the G –region
─── Boundary of the B –region
─··─··─ Boundary of the K –region
········ Boundary of the A –region
············ Boundary of the M –region

FIGURE 2
The Marketing Regions in a System of Central Places

Figure 5: The marketing regions in a System of Central places and the distribution of Towns as Central Places in Southern Germany. Source: Christaller (1966, eng ed 1966) Central places in southern Germany p. 66 e p. 225

In this sense, according to the Christallerian approach the frequency of demand and the degree of sophistication of the good or service offered would underlie the distribution of commercial functions. In an ideal-typical manner that devoid of the friction of spatial morphology, rare functions and services would characterize larger cities while smaller and more peripheral urban centers would accommodate services and functions that gradually descend in distinctiveness. Thus, defining urban hierarchies would be the different concentration of services and functions on a principle of rarity and sophistication defined by C. in terms of *threshold* and *scope* that value the connection between the nodes and their respective 'complementary regions' (or market areas) in such a way that the hierarchical network of centres cannot be conceived without a corresponding hierarchical areal subdivision.

To sum up, these processes assume the name of *hierarchy – determined networks*, territorial systems in equilibrium whose outer boundary corresponds to that of the 'complementary region' of the highest-ranking 'central locality'. This is also the centre of the system. The relationships between the nodes (central localities) are dissymmetrical (tree graph).

The topic of the concentration of functions and services thus opens up two points of crucial relevance: on the one hand, it highlights the principle of spatial monopoly definable as «the ability of a system of competencies to be recognized as the only legitimate actor operating in a certain area» (Osti 2010); on the other hand, it highlights the fact that an area of attraction is created around a city (Bartaletti 2006).

What is being discussed (and about which this work also questions) are hinterland boundaries: where one city's sphere of attraction ends, and another's begins. In this sense, the literature has long highlighted the crucial role of mobile commuting flows in defining a city's sphere of attraction.

To sum up, the explanation of territorial hierarchies is a broad thematic terrain characterized by (1) cognitive and symbolic and (2) functionalist explanations of which Christaller provides an early, celebrated and discussed explanation that initiated a fruitful stream of studies that sees as a pivotal element the concentration of functions and goods delivered according to the frequency of demand.

 In the Italian context, central location theory has had numerous readings, interpretations, and applications since the 1960s (see table 2). In fact, several functional classifications of Italian cities began to follow one another, starting with the Classification of municipalities according to urban and rural characteristics proposed by ISTAT in 1963, which based its research on five indicators:

1) percentage of people employed in non-agricultural activities, 2) percentage of people employed in tertiary activities, 3) degree of education, 4) degree of centralization of the population in the capital, and 5) presence of sanitation in dwellings.

The attempt to define a tool that would reveal the characteristics of the Italian urban composition went togheter with the contemporary transformations of the city, its forms, and relations. In 1968 Mainardi proposed a *centrality index* based on the presence in individual municipalities of commercial, banking, educational and administrative services. In 1971 Dematteis analyzing Alpine cities identifies a minimum threshold of employees in

activities considered central (trade, credit - insurance and services). In 1973 is the *Atlante economico - commerciale delle regioni d'Italia* published by SOMEA, which for the first time proposes to elaborate an urban hierarchy on a national scale with the aim of verifying in a capillary manner the «degree of adaptation to demand of the supply localized in the individual centers», considered poles of attraction for the relative areas of gravitation.

In the 1980s, SOMEA published new research on the Italian urban network (*Atlante economico e commerciale d'Italia*, 1987), which compared to the previous one differs in that the analysis was extended to all Italian municipalities, regardless of population threshold. In addition, in this research the separation within the tertiary sector between the so-called traditional commercial activities and services and the advanced (or "quaternary") tertiary sector is made explicit, which includes, for example, consulting, advertising and market research services: the traditional type activities are considered to serve households, the latter to serve businesses, to facilitate their management and operation.

Since the 1990s, interest in hierarchical functional classifications in Italy has been declining. Sensibilities change and scholars question the significance of hierarchical ordering of urban centers: analyzing and searching for hierarchical ordering among cities is no longer meaningful because the link between demographic demand and functional specialization is gradually broken.

ANNO	TITOLO	ENTE PROMOTORE/ AUTORE	INDICATORI	INDICI	
1963	Classificazione dei comuni secondo le caratteristiche urbane e rurali	ISTAT	Percentuale di occupati in attività extra agricole percentuale di occupati in attività terziarie grado di istruzione grado di accentramento della popolazione nel capoluogo presenza di servizi igienici nelle abitazioni		
1968	La rete urbana dell'Italia settentrionale	Mainardi	presenza nei singoli comuni di: servizi commerciali bancari scolastici amministrativi		
1971	Le località centrali nella geografia urbana di Torino (1966) e alle città alpine (1971)	Dematteis	soglia minima di addetti nelle seguenti attività: commercio credito – assicurazioni servizi		
1973	l'Atlante economico – commerciale delle regioni d'Italia	SOMEA	La clientela attratta da ciascun centro di offerta La spesa per i servizi e commerci considerata il grado di disponibilità, per i consumatori, dei servizi e commerci considerati (classificate in 8 tipologia)	Indice di attività commerciale Indice di soddisfazione	In base all'intensità di presenza di tali servizi i centri d'offerta vengono ripartiti in 13 classi, contrassegnate con numeri arabi da 15 - il rango più elevato - a 3, quello più banale.
1987	Atlante economico e commerciale d'Italia (comprensivo di tutti i comuni)	SOMEA			

Table 5: Author's elaboration on Bartaletti (2006); De Matteis and Vagaggini (1985)

3.2.2 The territory as polycentric networks

> In generale si osserva che i nodi della rete metropolitana presentano substrati storico-culturali particolarmente «densi» e stabili nella lunga durata storica, i quali hanno sempre funzionato, e funzionano tuttora, come «brodo di coltura» delle innovazioni capaci di assicurare la riproduzione delle città. (Dematteis in Curti and Diappi 1990 p. 35)

In the literature the so-*called reticular principle* emerged, emphasizing the centrality of interconnections and networks of cities, acting complementarily and as a system. The individual gravitation areas of these would merge into a large area that gravitates to the network as a whole. Dematteis and Emanuel (1992) point out that, since the 1970s, there has been a shift from a «polarised territorial structure» to a «networked and polycentric one», and that this process, defined as counter-urbanization, has occurred because of several conditions such as the spread of infrastructures, the territorial redistribution of incomes and of the demand for goods and services for final consumption, but also the urban crisis in compact metropolitan areas, the decentralization of production and the endogenous development of local production systems. In spatial representations of the urban phenomenon, the image of the network recurs more and more frequently.

Nevertheless, as literature highlights, it is possible the coexistence between reticular and hierarchical structures in territorial organization. Literature highlights how the hierarchical system and reticular system sometimes oppose and sometimes they complement each other in different territorial contexts and at different functional or dimensional scales. In particular, the reticular hypothesis, with collaborative networks of specialized and interacting urban centers, presents itself as an important theoretical cue that opens up interpretative dimension of urban phenomena and enables thinking of the territory as a self-regulating system (Dematteis in Curti and Diappi 1990). In the same reticular structure act simultaneously centrifugal pushes oriented toward the expansion and centripetal ones tending to limit its interactive and vocation. "Urban network" can be thus understood as a network of centers that are connected to each other by relationships or assumed to be so.

Different conceptual types of urban networks have been highlighted in the literature in this regard. One of these examples is the so-called *megalopolis,* a territorial form largely investigated in the last decades in Urban Studies.

One form of urban spatial organization typically articulated on hierarchical levels and on corresponding network is the *megalopolis*, identified by J. Gottmann (1970) as the new urban structure emerging in the so called developed countries.

it can be described as a metropolitan-level polycentric network grounded on a web of networks that in turn is detached from a continuous interstitial background of diffuse localizations (residences, greenery, etc.).

Nevertheless, literature highlight how megalopolis can be considered as:

1. A networked urban system, in the terms in which there is any kind of self-containment of its network interactions.
2. A developed macro-regional space in which nodes and network interactions are particularly dense. In this case, megacities would be the highest-density part of a single large planetary network system at the metropolitan level.
3. A set of local units and their locations among which there are more intense relationships of interaction than with others, without bothering to define within which geographic areas this occurs, it being sufficient to identify.
(Dematteis in Curti and Diappi 1990 pp. 34 e segg.)

Well-known in the Italian context the figure of the *megalopolis* has been used by Eugenio Turri (2000) for describing North Italy context in the terms of *megalopoli padana*. The debate around this comparison crossed last decades with several references (Bagnasco 2009 Scott 2001) that take in consideration also the notion of global region that the following paragraph will little explore.

Box 2: THE MEGALOPOLIS AND THE NETWORKS

Another point relevant for the contexts here discussed regard the articulation of the networks in the *rural – urban* relation. At this scale the reticular organization can be described in the words of Dematteis as a phenomena of «urbanisation of the countryside and ruralisation of the city» (fenomeni «dell'urbanizzazione della campagna e della ruralizzazione della città). The reticular organization occur through processes of urban functions spread and concentration (Emanuel 1989).

In small and medium-sized centres, the expression of the regional countryside, as a result of decentralisation and the expansion of metropolitan 'fields of externality', urban services and activities are generally established at a higher level than their rank.
(Emanuel in Curti and Diappi 1990 p. 162)

This enhances the range of locally available services and changes the functional profiles expected of perfectly hierarchical urban structures. Moreover, there is - at least in theory - the emergence of substantial interchanges of services between centres with the formation of a strongly interconnected and interdependent relational structure.

This makes the smaller centers more autonomous and, in some cases, allows them to offer services to the main city, constituting a new way of integrating and expanding urban values, and thus the city itself, in the territory. This has also potential risks such as the more sporadic concentration of the more specialized activities. This increasingly lead upward the shift of the *urban threshold* in which those functions capable of producing innovation, decision-making and planning on a large scale are located. «This is, metaphorically speaking, the contextual 'ruralisation of the city', which is therefore manifested by the loss of influence, power and prestige of non-metropolitan centres'» (Dematteis 1990).
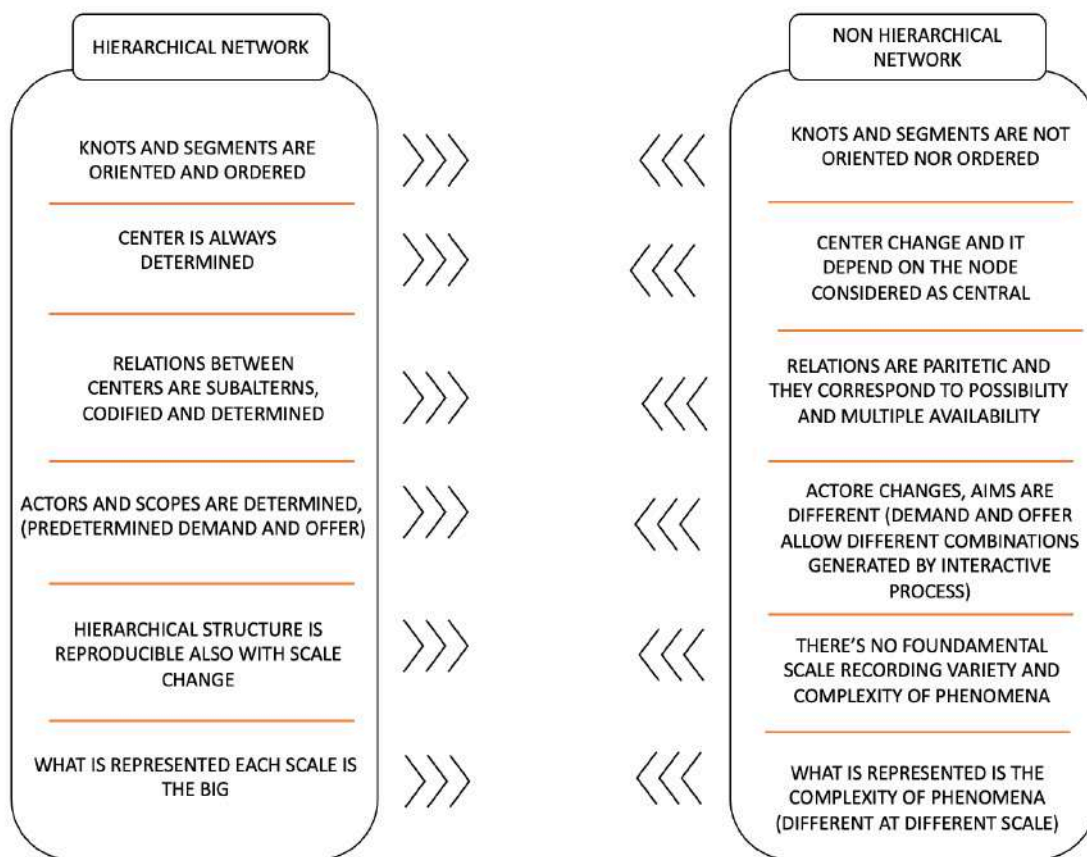
Figure 6: Differents on conceptions of hierarchical and non hierarchical network. Source Emanuel in Curti and Diappi 1990 (p.155)

Another well-known example of territorial network investigated in the Italian literature about urban transformation is what can be recall to the so-called *diffuse city* (città diffusa) [3] (cfr. P. 120). In deep relation with the economic and productive structure of the space, it is configured a «discontinuous territorial network», where the nodes were no longer connected by a hierarchical relationship (…) in the "diffuse city" non-hierarchical horizontal relationships prevail and here the specialization and the complementarity replace functional and productive subordination» (Micelli, 2000 in Mela, 2002).

nteresting is IATATEN's (1996) interpretation of diffuse city and urbanised countryside as spatial metaphors rather than fixed interpretative categories.

The nodes of that network are not configured as a simple element but can be considered as a system. The meaning and the quality of the node depend on the position it assumes both in the overall system of relations and in its history. Each node is therefore configured as a «local urban system» that could play several different scalar roles.

Next box gives a more specific insights about these topics and the territorial specificities in the North East context.

INDUSTRIAL DISTRICTS AND THE
THIRD ITALY

If, on the one hand, the large cities of the North West (Turin, Genoa and Milan) emerged with the industrialization, under the strong demographic push, modifying the homogeneity of the medium-sized cities in the centre-north (Trigilia, 2014), on the other hand, small and medium-sized cities, although very different within the national context, have played a key role in the processes of widespread industrialization of small and medium-sized enterprises (SMEs), just think of the Third Italy (Bagnasco, 1977) and the so called "distretti" (Becattini, 1998; Pacetti Picchierri, 2021).

If the North-West was characterized by the presence of large Fordist companies, first and foremost the Turin "company town" (Bagnasco, 1990), which drove and imposed its economic model of Italian modernization, on the other hand Bagnasco (1977) points out that, in addition to the South, there is a third line of territorial and industrial Italian development. In this context, geographically identified more clearly in North-Eastern and Central Italy the small and medium-sized centres, that are the prevailing scenario, are configured as «active elements of the development processes» (Debernardi 2002). The entrepreneurial dimension is the outcome not only of economic characteristics but also of socio-cultural ones such as the family structure, the civil society organization, and the political-administrative culture.

This is an entrepreneurship, that finds in the 'diffuse' dimension a fertile soil, and it is connected on the one hand to long-lasting productive traditions, a specialized production rooted in a 'widespread know-how' (Pacetti - Picchierri, 2021), a shared good both for the competitiveness of the individual company and the system as a whole. On the other hand, a crucial aspect of the 'district model' lies in the relational dimension between the businesses that create the district, in which the dynamics of competition and cooperation merge in unwritten 'rule of the game' outside the market dimension.

With the crisis of Fordism and the affirmation of a globalised world, the districts seemed to resist longer than the industrial cores (especially if they were monoproductive) (Trigilia 2014), but the model evolved in the 1990s: on the one hand at the national level there is a progressive legislative recognition of them that formalizes those "unwritten rules" mentioned above, on the other hand the entrance in global dynamics leads to a quantitative decrease and, for the districts that "survive", there is an upward qualitative, repositioning of products under "made in Italy" label and the role in terms of territorial social cohesion is made explicit.

Box 3: INDUSTRIAL DISTRICTS AND THE THIRD ITALY

The one presented is one of the approaches suggested in the interpretation of the network relations of territory. Indeed, later Marxist streams of explanations (Harvey 1976) views spatial hierarchies differently, as the result of the process of capital accumulation and the related valuing and maximization of spatial profit in terms of natural resource exploitation, land rents, and building speculation.

3.3 READING TERRITORIAL DIVERSITY IN ITALY

3.3.1 Vertical vs horizontal interpretations

> Le diseguagliane finiscono col lacerare anche i luoghi, le regioni, gli spazi, le geografie
> (Bevilacqua in De Rossi edited 2018 p. 120)

> Italia di montagna, montagna alpina e montagna metropolitana, Italia di collina, pedemontana, vitivinicola, Italia di costa, Italia di isola, Italia di montagne sprofondano nel mare, Italia di fiume, Italia di lago Italia di pianura, di noia e di pendolari, Italia di industria e di capannoni abbandonati, di rifiuti bruciati e di inquinanti chimici, Italia di autostrada e di sentiero, Italia di abuso edilizio, di centro storico e di giardino, Italia di tunnel e di passi montani, Italia di traghetti e di crociere, Italia di alpeggi, di pescherecci, di cantieri navali e di risaie, Italia di città, di una manciata di grattacieli e di monumenti laici, di madonne che guardano le città dall'alto, di santuari e terrazze, Italia di campanili e di palazzi comunali, a volte da ristrutturare. Di università e suole superiori temporanee, di asili privati. Italia di aziende a conduzione familiare con una manciata di operai, di multinazionali del cibo. Italia di aziende dell'*automotive* e di un indotto fermo e di intelligenze artificiali. Italia di parchi naturali, di lupi e di cinghiali, di volpi e gatti randagi. Italia di farmacie, di tabacchini e di qualche discoteca.

First two paragraphs of this chapter introduce the multiplicity of ways of organizing the territory and its functions. These few lines introduce the multiplicity of things and images that Italian territorial landscape could evoke. Italian territories have been thought and represented in several ways, following paragraph will briefly introduce – without any claim to exhaustiveness according to the weight of the topic – the several ways in which Italian territory has been sectioned, classified and represented in recent literature.

In fact, this topic is a classic long-standing territorial and geographical studies; suffice it to mention the classics, the ITATEN research edited by Clementi, Dematteis and Palermo published as Le forme del territorio italiano (The Forms of the Italian Territory) in 1996, which sought to look at old and new images of Italy's diverse territorial dimensions.

But that's not all: Guido Piovene's Viaggio in Italia (1957) is an important historical-territorial document – an inventory - of the multiplicity of possible looks at Italy, just as the several historical television and radio programs has allowed the diffusion of these representations since after the war. So many cultural products with as many vocations that allow us to navigate through Italian territorial scenarios. In fact, as the Territory Report points out (ISTAT 2020 p. 7):

> L'Italia, da questo punto di vista, presenta differenze molto ampie tra il Nord e il Sud, tra città e campagne e tra le zone di pianura e quelle di montagna, che in larga parte si sovrappongono alle aree interne. D'altra parte, la qualità della vita – comunque la si voglia intendere – spesso è influenzata da elementi diversi: i grandi centri urbani, a confronto con le aree rurali offrono attrazioni e servizi, ma a prezzo di tempi più sacrificati per la vita di relazione, minore disponibilità di risorse ambientali, criminalità più elevata.

In synthesis, this paragraph is functional for the work introducing *intermediate Italy* and its relevance on a national scale.

If in the international literature historically the dycotomy *urban – rural* have been productive and at stake of different conceptions of territory, also in Italy it has been relevant with important specific and context-based implications given by the morphology and the historical patterns.

In Italy, indeed, the most relevant classification of the territorial scenario has been for decades the *dichotomy North – South*. As Cersosimo and colleagues emphasize (in De Rossi 2018), «for more than a century, North-South dualism has been the prevailing territorial interpretive *topos:* an irreducibly dichotomous Italy, two different societies, morphologically and *morally* dissonant». A persistent North - South dualism that characterizes economy and society more generally (ISTAT 2020) that is intertwined with to territorial differences articulated in the continuum from urban to inner areas.

That North - South can be read as the longest-lived of the so-called *vertical* readings (Bevilacqua 2018) of Italian territorial diversity, in which a *compact* and modern, productive, urban, developed North was contrasted with a *compactly* traditional, underdeveloped, agricultural, *amoral* South.

Within such readings are traced the city-countryside, plain-mountain dualism, but also Rossi Doria's opposition between the so-called *pulp and the bone*, which hierarchically represent separate universes that are difficult to reconcile. Beginning in the 1970s, the dualist view of territorial structure paves the way for a third interpretation, crucial to the studies of the discipline, the so-called Tre Italie model that radically changes Italian representation *tout court*.

Once the conception of big company as the only model of territorial development has been overcome, it is possible to read a rearticulation of the territory between a North-West dominated by the *Fordist capitalism of large companies*, the Centre-North-East in which there are mainly small companies, industrial districts, cohesive local companies and, finally, the South characterised by economic dependence. Although the model of the Three Italys calls into question a dichotomous reading of territorial trends in Italy, it is emphasised in the literature that it refers to the vertical mode of reading of the territorial in which the content of classifications is homogenised into macro-divisions.

The need for a «critical review of traditional images» (Clementi, Dematteis and Palermo 1996 Vol 2 p. 3) is longtime defined as a fundamental matter looking for alternatives to the *unitary pictures and moving forward from simplifying structural schemes towards the proposal for an empirical exploration of local diversity.*

In this sense, literature claims for *horizontal approaches* in understanding territory and its internal differences within the same spatial and functional domains. Indeed, contemporary territorial transformations can't be captured in homogenizing and polarizing representations since within the same geographical portions continuous composite, hybrid, contradictory aspects are present. These turn *vertical* representations obsolete lenses no longer useful in telling the mosaic of processes that characterize Italian territorial scenarios today.

Distinctive of the Italian territorial texture and settlement history is the network of medium-small towns that have built the historical Italian network. The polycentrism that characterises the Italian scenario is first and foremost a historical polycentrism, stratified by the epochs that have progressively redesigned its hierarchies and relations, as highlighted in the previous paragraphs. Also in the Italian context, as pointed out in the literature (Lanzani and Zanfi in De Rossi 2018 p. 123), redefining the Italian territorial hierarchies are processes of an administrative nature, infrastructural, on whose main lines a large part of growth is grafted, and productive, characterised by uneven industrial development. The extremely varied Italian territory is thus the outcome - albeit in the making - of various processes that have followed one another over time.

As anticipated, there are several ways of analyzing the heterogeneity of Italian territorial contexts. First, A long-term exercise, classifies the territory geographically by altitude zones. Istat (2020) classifies municipalities by altimetric zone and distinguishes between: inner mountain, coastal mountain, inner hill, coastal hill and plain. In most regions, inner mountains and inner hills are the predominant categories in terms of surface area.

Looking at demographic processes from this point of view, an inverse relationship between mountains and population dynamics is generally observed in the years 1972 to 2014. In almost all regions with a mountainous territorial predominance (Calabria, Molise, Basilicata, Piedmont, Liguria), negative or close to zero average annual population growth rates have been observed over the last 40 years. As will also be seen later, the population increases in large urban centres (in Lazio, Lombardy and Campania) and in regions with a predominantly lowland territory (Veneto, Apulia, Emilia Romagna).

What has just been mentioned has very deep historical roots and has also been defined in literature in terms of so-called rural emigration. By rural emigration it is described the long-term process of depopulation that regards alpine and Apennine Mountain, and hills since the first half of the 20th Century. This process becomes crucial in the redefinition of national territorial and settlement structures. The so-called *poor, marginal and disadvantaged areas* (Bevilacqua 2018 p. 120) enter the Italian territorial debate since the 1930s and primarily concern the Alpine and Apennine mountain areas. The shift from seasonal to permanent migration, the overcoming of the traditional *half-peasant, half-worker figure* according to the seasons, gradually erodes the mountain (and rural) economic system, leading to the disarticulation and definitive breakdown of the balance between mountains and plains, with the hills gradually losing their connecting function.

3.3.2 Highlands, mountainous lands and inner areas

In Italy, mountain areas (Scaramellini 1998) have played a crucial role in Italy's morphological understanding, occupying more than half of the national territory in terms of surface area (54.3%). Clearly, this spatial extension does not correspond to the same demographic extent; in fact, only 19% of the population resides there (ISTAT 2007). These data result from the classification of *totally* mountainous municipalities, *partially* mountainous municipalities, and non-mountainous municipalities (According to the Laws No. 991 of 25 July 1952 and No. 657 of 30 July 1957), as shown in the map below (Map 3). The characteristics that a municipality must have in order to fall within the above classification are as follows: 1) at least 80% of the surface area of the municipality is located above 600 meters above sea level; 2) the difference between the upper and lower altimetry is greater than 600 meters[4].

The main characteristics of mountain Italy can be summarised in the following terms: low population concentration in the territory, high fragmentation of settlements, depopulation phenomena, ageing of the population and economic marginality.

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[4]A municipality is defined as *partially* mountainous if it only fulfils the second criterion.

From a regional point of view, the regions that contribute most to the definition of Italian mountains are: Sardinia (11 %), Trentino-Alto Adige (8.3 %) and Piedmont (8 %) are the regions with the highest percentage of mountain municipalities, in terms of population instead Lombardy (11.6%) of the national total, Trentino-Alto Adige (9%) and Sardinia (7.7%).

In Valle d'Aosta and the autonomous provinces of Bolzano and Trento, all municipalities are classified as totally mountainous. In the North-West, the greatest importance of mountain territory is recorded in Liguria, with almost 80 % of mountain municipalities covering 81.5 % of the regional surface area; however, the mountain population is only 22 % of the total, also because three of the four main municipalities (Genoa, La Spezia and Imperia), where most of the regional population is concentrated, are non-mountainous.
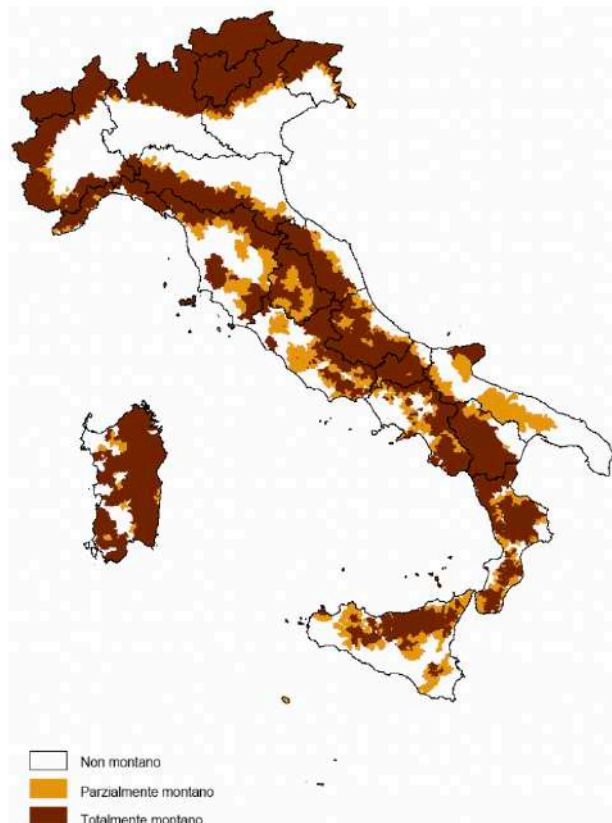
Map 2: Italian municipalities by degree of mountainousness (2004). Source: Istat elaboration based on UNCEM data

From the point of view of dynamics, the Alpine and Apennine mountains have experienced contemporary territorial challenges on different scales and at different levels of comprehension.

The mountain is clearly not one, it is in turn profoundly diversified: the Alpine mountain has certain territorial and settlement characteristics (Viazzo 1989), the Apennine mountain others (Emidio di Treviri edited 2021), but also the so-called *middle mountain*, not only in the middle in terms of altimetry but also in terms of *its ability to dialogue with other altitudes* (Varotto 2020). From one side[5], it is recognizable a long-term impoverishment with the abandonment of the land of agro-pastoral activities and hydraulic-forestry. This is an emptying not only of human but also of economic, skills and fixed capital, infrastructure, and housing.

All this has led to the breaking of a systemic balance that runs the risk of the loss of dialogue between humans and nature, which is also functional for the surrounding and downhill territory.

On the sidelines of these processes rises the risks of territorial exploitation of mountain which, also in the light of climate change and rising temperatures, is in danger of moving from a place *in its own* towards an urban recreational function, a second exclusive place of service and passive, emptied of its active competences.

From an analytical point of view, Italy's mountainous areas are included in the widely investigated inner areas (De Rossi ed. 2018) although it is worth stressing that inner areas and mountainous areas cannot be considered as synonyms as they are the result of territorial classifications deriving from different assumptions.

The inner peripheral and ultra-peripheral areas are the result of the classification of the Italian territory on the basis of principles of accessibility to essential health, education and mobility services. This classification has produced a cartography in continuum of the centrality of the territory in Italy, ranging from the pole areas - service providers - to the ultra-peripheral areas where times are longer than 75 minutes to reach these services.

This results in six categories of territories on the basis of a peripherality indicator that aims to measure the «level of spatial peripherality of the places in which people who suffer from the territorial gap with respect to the network of urban centres live» (Carrosio and Faccini, 2018 p. 54). The categories are defined as follows: A - poles, B - intermunicipal poles, C - belt areas (less than 20 minutes' distance from service provision centres), D - Intermediate areas (20 to 40 minutes' distance from service provision centres) , E - peripheral areas (40 to 74 minutes' distance from service provision centres) , F - ultra-peripheral areas (more than 75 minutes' distance from service provision centres) (Uval 2014).

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[5] Sebbene la letteratura evidenzi la presenza di una *montagna forte* in termini di dinamiche demografiche e socio economiche che corrisponde alle province autonome del Trentino Alto Adige e della Valle D'Aosta, che in linea con una vocazione turistica e di raccordo con i centri principali ha saputo trovare nei decenni uno sviluppo in controtendenza con il resto delle aree montane nazionali.

The municipalities of the inner areas are mostly located in the Alps and on the Apennine dorsal, but not only, they are also present on the islands, on the coast and in the inland hills (CFR. Map 3)
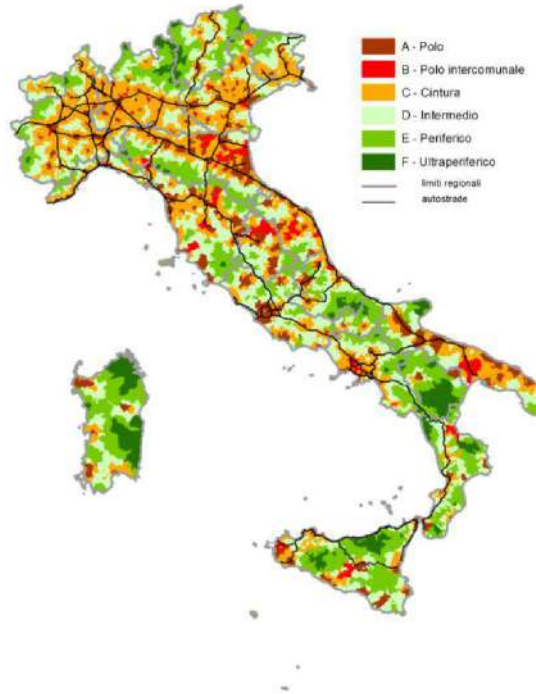
Map 3: Inner areas classification according to SNAI

In numerical terms, in 2019, there are 4,076 municipalities classified as Inner Areas, or 51.4% of the total, representing a total of 21.9% of the population and about 60% of the national surface area. Between 2014 and 2019, the number of people living there permanently decreased by about 250,000 (just over 13.2 million in 2019), or 1.8%, compared to -0.7% recorded for Italy as a whole (-0.4% for all non-inland area municipalities). This phenomenon is more accentuated in the Islands (-2.4%) and in the North-West (-2.1%) and more contained in the Centre (-1.3%).

The characteristics concerning inner areas are those already mentioned of depopulation, ageing of the population and reduction of employment.In 2019 the old-age index (indice di vecchiaia) is higher than the national average (173) in all the distributions, with a peak of 207.2 in the North-West. The upward trend in the index between 2014 and 2019 is attributable to both the increase in the elderly population (65 and over) and the decrease in the young population (0-14). Similarly, the dynamics of the structural dependency ratio testifies everywhere to an increasing incidence of the most vulnerable age groups (0-14 and 65 and over) with respect to the population of working age (15-64): the generational imbalance and the undermined sustainability of the population structure are more evident

in the Inner Areas of the northern distributions, while in the Centre-South the values are in line with or lower than the national average.

From an environmental point of view, inner areas have the largest natural capital (Carrosio and De Renzis 2021), containing more than 70 per cent of the forest area, about 55 per cent of the agricultural area and more than 77 per cent of the area protected by parks. Moreover, they are characterised by high biodiversity density and high habitat quality (Ispra 2019). However, this wealth risks progressive degradation.

Table 6: Population and natural capital in inner areas. Source: Carosio and Derenzis 2021

	Aree interne	Resto d'Italia
% popolazione	21,98	78,02
% km²	59,91	40,09
Densità abitativa	73,82	379,35
% superficie forestale sul totale nazionale	71,83	28,17
% superficie agricola utilizzata (SAU) al 2010 sul totale nazionale	55,18	44,82
Variazione % della superficie agricola utilizzata tra il 1982 e il 2010	−20,89	−18,79
Variazione % della superficie agricola utilizzata tra il 2000 e il 2010	−3,02	−2,47
% superficie protetta/superficie totale	13,40	5,80
% superficie protetta/superficie protetta nazionale	77,47	22,53

In terms of vulgate, inner areas correspond to marginal lands in terms of accessibility, socioeconomic characteristics, infrastructure and essential services, fragile due to depopulation and demographic risks. The National Strategy for Inner Areas and its territorial classification, launched in 2014, has had the merit in the last 10 years to arise the awareness on territorial marginalities and territorial inequalities in Italy, to propose an innovative gaze on the diversity of Italian territory, giving a statistical framework towards policies and strategies locally - based and co - produced with local actors.

The debate on territorial marginality has also highlighted how the notion of marginality is configured as multidimensional in which various indicators and elements concur to define the degree of marginality and centrality of a territory, which is why not all internal territories are marginal in the same way and for the same characteristics. However, if the nexus between marginal territories and inner areas is indissoluble, the cartographies of marginality and inner areas in terms of relevant

indicators have been questioned specifically with reference to the issue of accessibility that binds the present work (Vendemmia, Pucci and Beria 2022).

This theme will be deepened in the specific case of the intermediate areas investigated, as the processes of territorial marginality are also present and worthy of scientific interest in such contexts, which are less travelled by the mainstream literature.

3.3.3 Metropolitan areas, metropolitan cities, poles and cores

On the one hand, inner areas and on the other, metropolitan areas. While Italy is certainly a nation historically of cities and municipalities, these are not metropolitan tout court, characterized by dynamics of very high population concentrations. In fact, what characterizes, as repeated several times in the paper, the skeleton of Italian urbanization is built on small to medium-sized cities. Nevertheless, the literature on Urban Studies strongly focused on the last decades to investigate metropolitan and core areas (among others Cafiero and Busca, 1970; Bartaletti, 2009; Balducci et al 2016; Colleoni and Boffi 2016) looking for the definition of range and functional areas around main cores in Italy, on the given international examples (Map 4).
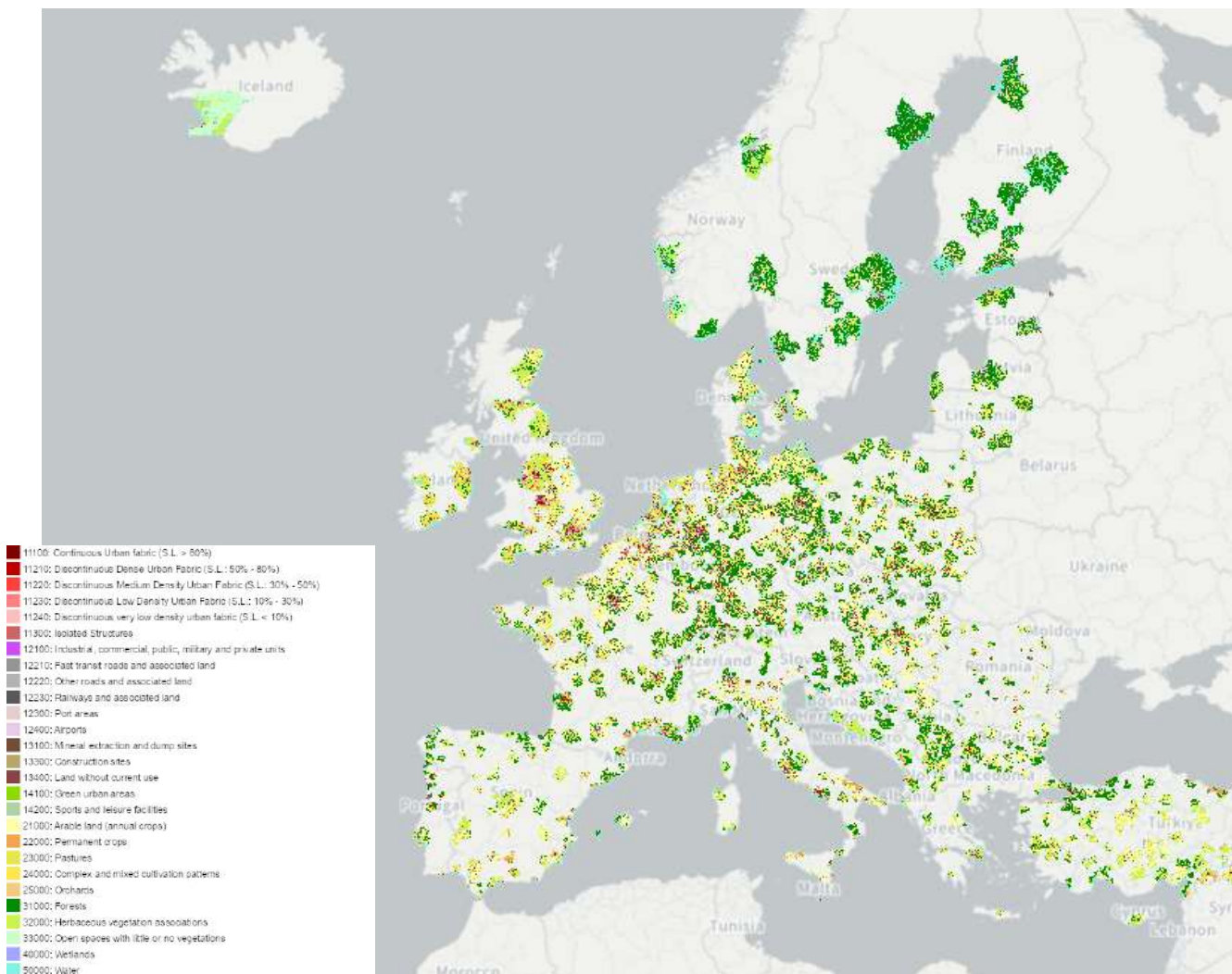
Map 4. Urban Atlas Land Cover/Land Use 2018. Source: European Environment Agency

At the international level, in as also emphasised later (see 3.4.2), the need to find new administrative metrics to read urban processes and govern them has become increasingly urgent. From several quarters, however, criticism has been voiced regarding the definition of metropolitan cities to replace the provinces of the capitals selected as metropolitan, precisely because of the composite nature of the provincial territory that cannot be fully ascribed to metropolitan-type dynamics. The case of the metropolitan city of Turin is emblematic in this sense, with respect to the difficulty of defining as metropolitan the large mountainous part of the province on the French border. From the point of view of dynamics, metropolitan cities correspond to 15.4 % of the national surface area, represent 16 % of the municipalities, and 36.2 % of the population (over 21.3 million) resides there, 56 % of which live in the urban belt.

They represent the most dynamic urban sphere in socioeconomic terms and are characterised by substantial population movements even within their own territory (ISTAT 2023), although this

dynamic is differentiated according to context. In terms of population density, there are three of the most densely populated municipalities in the country, Naples, Milan and Turin, and as many below the threshold of 1,000 inhabitants per square kilometre (Taranto, Reggio Calabria and Venice).In line with the international panorama, Italian metropolitan cities have experienced suburbanisation processes with differentiated outcomes, of which the following section provides an historical-analytical overview (see 3.4.2).

Moreover, several indicators are mobilized in literature to frame the metropolitanity and also several examples are provided in Italian contexts. Early research on Italy's metropolitan areas, however, rather than providing a picture of the Italian metropolitan system was the result of the hierarchical territorial conception (box p. 109) aimed at individual central areas as metropolitan and vice versa.

Later, Bartaletti (2006) in 'identifying an absolute urban indicator, takes into account the number of total employees in the three particularly

qualifying namely trade, credit-insurance and business services sector (rental, information technology, this example first identifies an analysis based in addition to the demographic thresholds also of the rare functions the city carries. Moreover, recent research (Colleoni et al 2024) identifies a metropolitan index for Italian municipalities where in addition to residential and productive function a relevant aspect is the interdependence function analyzed on the basis of the O/D matrix. Once processed in a Qgis environment, metropolitan areas in terms of relevant functional areas are identified as areas where a greater part of the population gravitates toward the main core (Tab. 5).

Table 7: Metropolitan index indicators

Function	Dimension	Variable	year	Extend
Residential	Population	Resident	2021	National
Productive	Manufacturing activities	Employees	2021	National
Productive	Tertiary activities	Employees	2021	National
Productive	Public services	Employees	2021	National
Interdependecy	Mobility flux	O/D Matrix	Different	Metropolitan

Taking another approach, however, the main intervention of the legislature in Italy regarding metropolitan areas concerns the establishment of metropolitan cities with an important following debate.

METROPOLITAN CITIES IN ITALY

Territorial entity recognised by Article 114 of the Italian Constitution, formed by an aggregation of adjacent municipalities. Introduced with the reform of Title V of the Constitution in 2001, metropolitan cities are recognised as territorial entities of vast areas defined by the aggregation of contiguous municipalities, like provinces. In ordinary statute regions, metropolitan cities became effective as a result of the legislation contained in Law No. 56 of 7 April 2014, while in special statute regions their regulation is deferred to regional laws. They replaced the Provinces in ten urban areas of ordinary statute Regions with their own governing bodies and their respective territories coincide with those of the former Provinces: Rome, Turin, Milan, Venice, Genoa, Bologna, Florence, Bari, Naples and Reggio Calabria. Four metropolitan cities of the Special Statute Regions were subsequently added, which have adapted their internal organisation to the principles of the law: Palermo, Catania, Messina and Cagliari. The Delrio law defines its general institutional purposes in these terms: care of the strategic development of the metropolitan territory; promotion and integrated management of services, infrastructures and communication networks; care of the institutional relations pertaining to its level, including those with European metropolitan cities and areas (paragraph 2, Article 1). Source: ISTAT 2023[6]; 2017[7]

Box 4: METROPOLITAN CITIES IN ITALY

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[6] https://www.istat.it/wp-content/uploads/2023/02/Statistica-Focus-Citt%C3%A0-Metropolitane.pdf
[7] FORME, LIVELLI E DINAMICHE DELL'URBANIZZAZIONE IN ITALIA (ISTAT 2017)

- In Italy, the incidence of the urban population on the national total (56.0%, or 34 million inhabitants) is lower than the EU28 average (63.5%); it is 10 percentage points or lower than in France, Spain and the United Kingdom. The lower urban concentration is accompanied by a comparatively higher number of FUAs, as in France and Germany (84 FUAs, many of them less than 250,000 inhabitants), and does not descend from population density (200 inhabitants per km2), which is slightly lower than in Germany and the UK and about twice as high as in France and Spain

- At the national level, the areas with the highest population density are concentrated primarily within the metropolitan city systems, but also on the coasts. The high difference between the population density of the systems of Naples (3,147 inhabitants/km2, the highest level ever) and Milan (2,137 inhabitants/km2) and that of Rome (975 inhabitants/km2) is noteworthy, mainly due to a different geography that sees within the Rome system a greater diffusion of rural areas. The 20% of the LLMs that have predominantly increased in population are the systems of Trentino-Alto Adige, Lombardy, Veneto and Emilia-Romagna. In the Centre-South and the Islands, negative total balances are recorded almost everywhere; a few exceptions are Olbia/San Teodoro in Sardinia and Crotone in Calabria.

- Changes in resident population 2018-1951 also reveal the concentration of built-up settlements in large Italian municipalities and neighbouring ones, albeit in alternating phases of growth and decline in resident population, and the simultaneous spread of the diffuse city. This highlights how these two aspects coexist in the settlement development of large cities. These elements suggest how in many territorial realities, particularly in large centres, urbanised land has grown to the point of saturating the space available for new settlements, thus prompting a colonisation of the surrounding spaces. In absolute terms, the population of all capital municipalities peaked in 1971 (12.3 million) and then declined steadily until 2011 (10.3 million), with a slight increase in 2018 (10.7 million).

The most conspicuous contraction (-8.5%) occurs in the period 1981-1991. The only exceptions are the municipalities of Rome and Reggio Calabria, which continue to grow, albeit with a much smaller percentage change than in the previous period (values below 7%). The first and second ring municipalities as a whole, on the other hand, show positive percentage changes throughout the period considered, and in half of the cases the changes increased in the years 2018-1981.

This shows a redistribution of population within urban areas. The only exceptions are Genoa, Reggio Calabria and Trieste. The areas of Genoa and Trieste show, in fact, a constant demographic decline, while the population of the municipality of Reggio Calabria increases steadily throughout the time period considered and, at the same time, there is a decrease in population in the belt municipalities. Probably in this one case, the belt municipalities also find in the capital a destination for the region's substantial migratory flows.

- It should be noted that residential building in the period 1982-2011 increased in all urban areas in both the pole and belt municipalities, despite the fact that the resident population in many of the poles decreased at the same time. An effect, this, that can be associated among other things with the reduction in the average size of households (particularly with the growth in single-person households of elderly people who continue to live alone in the home of the previous nuclear family), with the overall increase in available space as a result of greater material wellbeing and, especially in the historic centers, with the recent but quantitatively relevant phenomenon of the destination of housing for tourist use.

Box 5: Demographic trends in major Italian metropolitan centres

3.3.4 Other ways of 'classifying' Italy

While urban and inner dynamics and altimetry thresholds are one of the most recurring exercises in the reading of spatial dynamics in Italy, as this work aims to do, many other possible interpretations have been proposed.

1. Bioregions
2. The role of coasts and inland waters
3. Tourism

First (Map 5), ecological land classification processes are a guiding tool for management and sustainable development strategies. Classification into biogeographical regions, ecosystems and ecoregions is an effective framework for biodiversity conservation strategies, natural capital enhancement and environmental risk assessment. Examples of use are biodiversity conservation plans, forest resource and environmental risk assessments, climate change impact studies and protected area planning. Biogeographical Regions, defined in the European context on the basis of vegetation, climate and geology, represent an ecological classification of the territory.

This way of classifying the territory allows the socio-demographic and economic characteristics to be analysed in combination with climatic, biogeographic, physiographic and hydrographic factors.

The *Po Province* accounts for about 16% of the territory, but twice as much in terms of resident population; the *Tyrrhenian Province* has the largest share of population (over 34%, on 28% of the surface area) and, with the same territory, has more than twice the population of the Apennine Province, the least densely populated in the entire country. Finally, a marginal part of the territory and population falls in the *Ligurian-Provençal* and *Illyrian coastal provinces*.
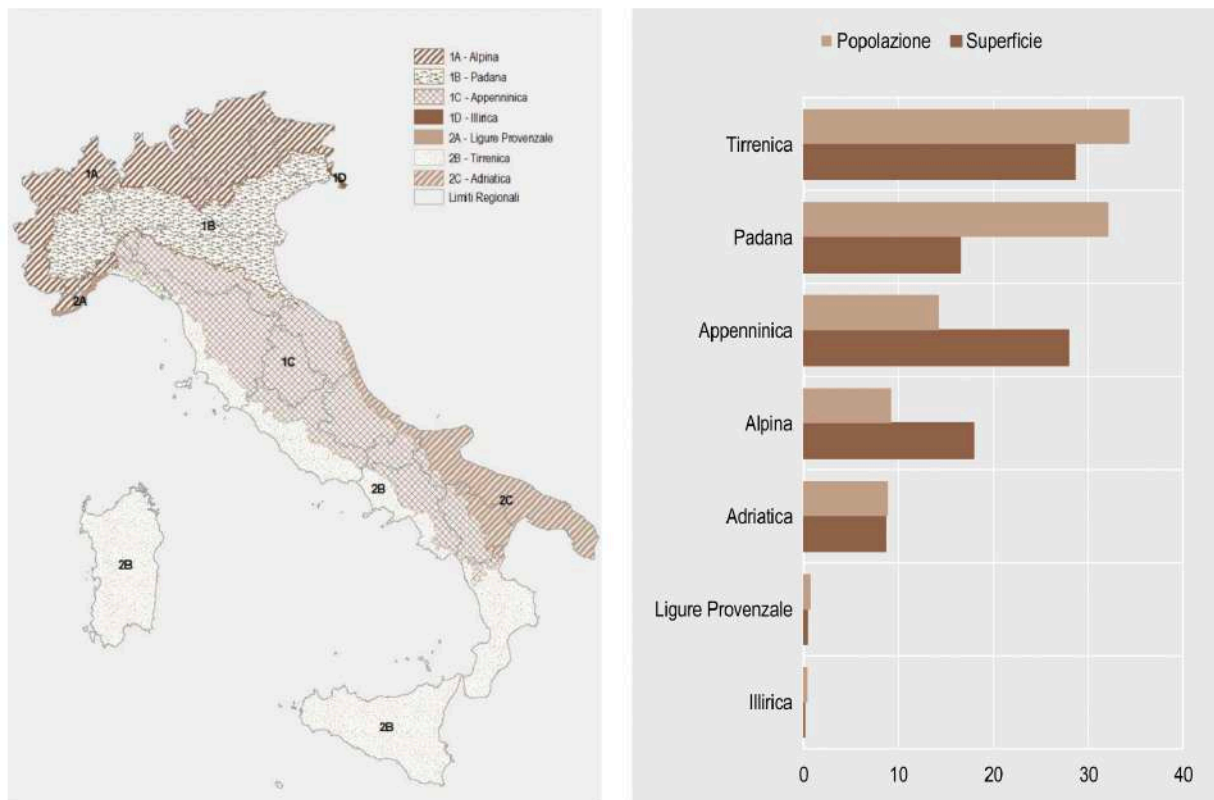
Map 5: 1. Provinces of the Italian ecoregions. 2. Surface area and population by ecoregion province (val. %; 2018. Source: Istat, rapporto sul territorio 2020)

From the point of view of the coasts, given the specific characteristics of the Italian territory, some elements need to be taken into consideration. The Italian coastal territory covers 6% of the European total, placing Italy in fifth place in Europe (due to the indented characteristics of its coastline, Sweden, Finland and the United Kingdom together account for about half of the Union's total coastline). What characterises the Italian coastal landscape, and makes it a relevant subject for the topic analysed here, is the degree of high urbanisation that has historically characterised it. The coastal belt is, in fact, the territory with the highest population density and where the development of urban centres is greatest due to the historical attractiveness of coastal areas. However, the high anthropic impact has in many cases led to intense exploitation and degradation of these areas, which are characterised by an often fragile environmental balance,

Land cover types in coastal areas are very diverse between regions. Overall, a quarter of the coastline is affected by human activities. The incidence on the coastline reaches 55% in Liguria and 47% in Friuli-Venezia Giulia, due to the presence of numerous urban settlements and coastal cities and port areas of considerable size (Genoa, Trieste, La Spezia and Monfalcone).

In addition to coastlines, Italy is characterised by the presence of important inland water basins that have shaped the urbanisation scenario. As far as Italy is concerned, in Piedmont, Valle d'Aosta and

Trentino-Alto Adige, the prevalent coverage is that of glaciers; this is not the case in the other three Alpine regions where, respectively, we have a notable presence of lake (Lombardy), river (Friuli-Venezia Giulia) and lagoon coverage in Veneto. Considering the other Italian regions, in Umbria Lake Trasimeno has the largest water surface area, while in Liguria, Molise, Basilicata and Calabria rivers cover a considerably larger surface area than the other types. The situation in Liguria is particular where, although there are no large rivers, the 'estuaries' class has the highest percentage value.

Lastly, mention deserves the classification of the territory into tourism areas (ISTAT 2020), carried out by Istat in response to the risks resulting from the pandemic. Italian municipalities are classified by "prevailing tourism category," that is, potential tourism vocation identified mainly on the basis of geographic (proximity to the sea, altitude, etc.) and anthropic (large urban municipalities) criteria. "Tourist density" is expressed by a consistent set of statistical indicators defined to measure the allocation of accommodation infrastructure, the presence of tourist flows, and the incidence at the local level of productive activities and employment levels in tourism-oriented sectors of economic activity, i.e., referring specifically to the tourism and/or cultural sector. The categorization in which municipalities are classified is as follows (map 6):

Map 6: Municipalities by tourism category (2019 absolute values). Source: ISTAT

- 1,575 (19.9%) municipalities that belong to only one tourism category,

- 633 municipalities (8.0% and 13.7% of the population) belong to two or more categories.

- More than half (50.6%), on the other hand, are the municipalities that have tourism facilities and flows, in some cases even significant ones, but do not belong to a specific tourism category.

- Finally, there are 1,704 (21.5 percent) non-tourist municipalities, that is, where there are no accommodation facilities and/or where tourist flows are absent.

The regional distribution according to tourism category shows a higher concentration of non-tourist municipalities in Piedmont and Lombardy, due to the large number of municipalities in these regions (2,691 out of 7,926, or 34 percent of the total), many of which are small in size. Similar concentrations in these two Regions are also recorded for tourist municipalities but not belonging to a specific category. There is, in addition, a map of tourism density (map 7) in which the synthetic index of tourism density is the result of the synthesis of the composite index of accommodation infrastructure facilities provision, the composite index related to tourism flows, and the composite index related to tourism-related economic activities.
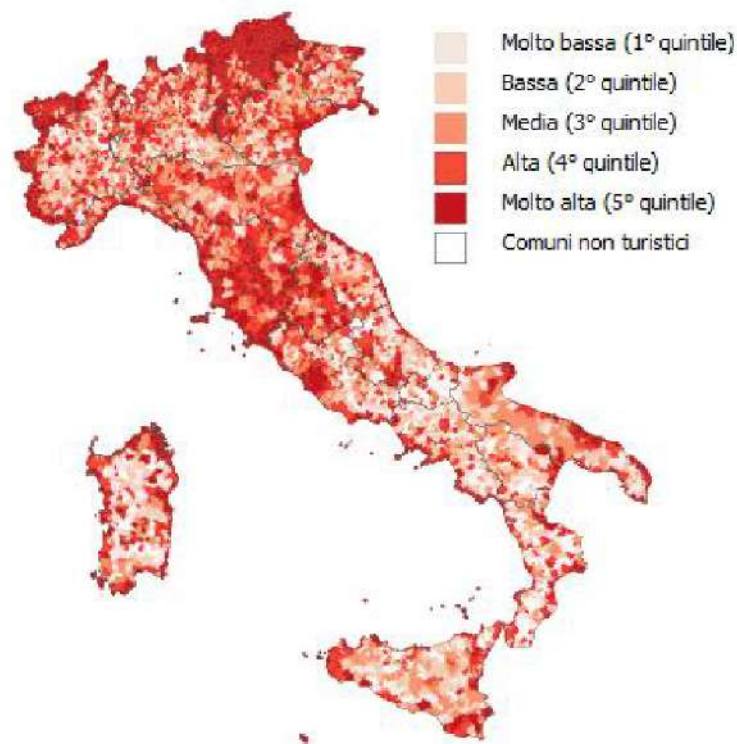
Map 7: Municipalities by classes of the synthetic tourism density index (2019, absolute values). Source: ISTAT

The topic of domestic tourism and the touristic degree of Italian municipalities has been the subject of debate in the post-pandemic season for several reasons. First the phenomena of *overtourism* affecting major international tourist hotspots in the country but not only. In the summer of 2020, the

so-called borghi - relatives of the previously mentioned inner areas - entered the public, scientific debate, and public action as a place to slow the spread of contagion because of their low population density, but also because of the consequences brought by 'home working, the inability to travel abroad, etc.

The notion of a *borgo* in its definition built from its aesthetically attractive potential left aside, however, the actual inhabitative significance of this, producing places in the image and resemblance of urban elites in search of *divertisment* and not in the measure of those already seeking to inhabit those territories (Cersosimo et al 2020)

> Da questo punto di vista, il borgo è un bene che riflette anche la scomposizione di classe della borghesia e le sue traiettorie di cambiamento: un progetto post-urbano per la borghesia metropolitana, un oggetto perduto per il ceto medio in crisi e un tratto della soggettività "critica" per il ceto medio riflessivo, mosso da preoccupazioni ambientaliste con tratti a volte tecnofobici.
> Vuoi come progetto, come oggetto perduto o come tratto della soggettività post-materialistica, il borgo si nutre di immaginari abitati dal vernacolo perduto, dal *loisir* domenicale e del contatto con quella "natura" che la vita urbana in città ha negato per scelta e costruzione. Facile rappresentazione, questa, ammalata di *metrofilia*, che come tutte le parafilie si nutre del desiderio per un oggetto percepito come atipico ma privo di una propria volizione, da soggiogare in un riconoscimento asimmetrico o distorto. Il borgo diventa così il comodo e informe contenitore dove riporre, deformandola, l'alterità dei territori, la loro diversità radicale. Come se i territori del margine non avessero un loro carattere autonomo e differenziato, non fossero da riabitare anzitutto fin dalla vita quotidiana delle persone.

Italy on the contrary, as the pamphlet Contro i borghi (2022) points out, is full of non-tourist, *ugly places.*

> "Di colpo si materializza un altro paese fatto di posti marginali, nastri d'asfalto, città deserte, spiagge, casine abbandonate, strade provinciali, giardini incolti, recinzioni di lamiera, bar e uffici deserti. Si scopre l'esistenza di quei luoghi che capita di vedere "quando sbagliamo strada o siamo smarriti o stanchi, o nelle soste dei viaggi, o nei giorni vuoti, nei pomeriggi in cui non si sa dove rifugiarsi"

Italy, in this sense, emphasize Barbera and Dagnes (2022) is a " is a beautiful country made, for the most part, of ugly places." These are places characterized by ordinariness (Robinson 2006), which do not have meaning for tourist guides and interests of tourist extraction but have, first and foremost, meaning and significance for those who live there.

Barbera and Dagnes (2022) give an effective description of them in the following quote:

> Necessità, questa, che le "città medie senza particolari qualità" condividono con larga parte del territorio italiano: campagne spopolate, tristi fondovalle, coste orfane del turismo di massa, distretti turistici invernali dove non nevica più. O come nel caso delle coste delle seconde case ormai semi-vuote e fatiscenti, prive di un ceto medio affluente capace di sostenerle. Diversità territoriale e policentrismo, però, che sono inghiottiti dalla semplicistica narrazione sulla "Bellitalia".
>
> Cittadine che, nel nostro paese, equivarrebbero a quelle che Arturo Lanzani ha definito "città medie senza particolari qualità", anche se non sono solo o necessariamente "medie". In Francia è da dove provengono i "Gilet Gialli", luoghi né centrali né periferici, luoghi mediani di conurbazioni estese e città medio. Così "svelato", il concetto di borgo mostra un paese molto diverso da quello promosso dalle guide turistiche e dagli immaginari che vi sono associati. Un paese, per esempio, pieno di luoghi lontanissimi dagli standard estetici del turismo, ma importanti per le persone che ci vivono anche se "brutti". Prendete due punti a caso sulla cartina, non confinanti: tracciando il segmento che li unisce, passerete con ogni probabilità da luoghi "brutti". Paesi con palazzoni anni '60, carovane di capannoni e centri commerciali, città medie senza particolari qualità, coste con seconde case ormai inutilizzate, villaggi turistici abbandonati: piccole, funzionalmente satelliti di poli che offrono lavoro e servizi. Spesso abitate da pendolari. E qualche importante qualità ce l'hanno, specie per chi ci vive.

It is also and particularly of this kind of Italy that beyond the demographic, socioeconomic cartographies, the established taxonomies, this work talks about and from which it takes inspiration in the first place.

That middle-urban Italy that does not fit into postcards, representations and urban imaginaries. It speaks above all of the flesh-and-blood people who inhabit them, who move and their ability and possibility to act space by moving more or less quickly. It looks in this sense at the banal realism of territories, inhabited and experienced by people (Cersosimo 2022) of what they ask for at the level of minimum habitability, what their demand for mobility is and how they imagine their mobility should be. This work is therefore an exercise in articulating between listening to observation, indulges strings that fall within representations, imaginaries and what little is quantifiable about our mobility.

In conclusion, many and other cartographies make it possible to read Italy's territorial multiplicity (Coppola et al ed. 2021): inland areas, seismic and crater areas, coastal areas and river areas, Italy of the plains, Italy of gastronomic productions etc., in addition to the deep investigated criteria of demographic and function concentration represented for example by metropolitan areas.

Italy, as already pointed out, is not a nation of large cities that have historically concentrated functions but precisely because of the historically polycentric character given by the presence of multiple centers of political and religious power and interest groups scattered along the country have ensured that the settlement inheritance is historically diffuse and multipolar.

Despite this, in line with what has been happening at the international, European level since the post-World War II period, Italy has also witnessed processes of metropolitanization of a few selected centers both from the point of view of demographic thresholds, concentration of innovation and possible representations.

All these *italie* looked at by lowest common denominators reclaim something, at least a story and a representation, in the sense of being looked at in their complexity, in this sense this research focuses on one of these possible interpretative prisms of Italian territorial diversity.

This research focuses on territorial transformation in terms of the palimpsest of symbolic, organizational (and political) rewriting of territorial (as well as cultural, economic and political).

The first point of observation considered the transformation in terms of shifting centers of power and hierarchies at different scalar levels. Within this thematic area converge discourses around the polarization of power, services, and gaze with the resulting potential territorial inequalities (Rodriguez Pose 2018; De Rossi eds. 2018; Carrosio 2019; Cersosimo et al 2020; Curci et al 2020).

Secondly, the chapter highlighted the possibility in reading the territorial scenario in polycentric and networked terms.

In the second part of the chapter it has been given a portrait of the Italian territorial landscape, focusing on the different conception and description of the Italian territorial diversity (from the historical dycotomy North vs South, City and Country, but also the Third Italy. Lastly, the paragraph summarizes the different taxonomy used in describing Italy such as Inner and metropolitan areas.

Once delineated the characteristics of the Italian scenario, it is possible to observe how an Italian territorial history without its intermediate areas is a stunted history that lacks a fundamental part of its territory. This second part of the chapter introduces Italian intermediate areas, the different perspectives offered by the literature, their role in the Italian territorial and settlement scenario, and possible research developments.

3.4 THE INTERMEDIATE AREAS AS THE SUBJECT AND OBJECT OF TERRITORIAL TRANSFORMATION

> Suburban spaces are, first and foremost, an actually existing element of
> the urban regions, regardless of whether they are desired, and they certainly
> have a concrete, material fundament.
> (Hesse and Siedentop 2018 p. 101)

3.4.1 Looking for intermediate areas with slippery boundaries

To distinguish between an explicitly metropolitan reality in Italy and a rest given by different gradients of urbanization is very difficult precisely because of the absence, as already pointed out, of large isolated and monocentric urban agglomerations and because of the territorial characterization articulated from a dense network of historical municipal territorial realities. These are held together in a network by a dense national infrastructure made up of historically distributed resources, in light of a process of sedimentation of very different local histories from one end of the peninsula to the other that have seen an univocal concentration of powers only late. For this reason, a reading of the Italian territorial scenario cannot be only a history of large urban centers but, on the contrary, cannot disregard an intermediate look.

The crucial role of medium-small cities in the Italian territorial scenario is coupled with the role of the more recent processes of suburbanization that takes different forms and vocabularies in the literature: processes of suburbanization, the so-called diffuse city, the processes of peri-urbanization that see in the spotlight - in line with international processes, albeit with contextual specifics - a territorial scenario that is unprecedented and sometimes of slippery understanding.

In fact, the process of territorial emptying of the upper lands is joined, during the second half of the 20th century, by the progressive very diversified and widespread densification over the territory of networks of medium-small towns: first and foremost, the Italy of the third Italy and districts with the production of urbanizations with a reticular configuration (Bevilacqua 2018).

In the light of what has been pointed out, it is possible to underline how a cone of shadow has been revealed in the urban literature with respect to intermediate contexts: medium-small cities, intermediate areas, middle Italy, the so called "Italia di mezzo" (Lanzani *et al* 2020) have struggled to impose themselves in the scientific and public discourse around the city.

These are areas of complex definition, complex objects in the dynamics of urbanisation that, while historically they have assumed a central role, today they are dealing with much more complex dynamics. This label is however slippery, as it can encompass multiple settlement scenarios depending on perspective and research interests.

As mentioned in Chapter 1 (1.2) Wandl e collegues (2014) gave an interesting introduction of the *intermediate / in- between scenarios*, arguing about the difficulties in dethatching a clear distinction between the "urban" and the "rural" since much of the territory is, indeed, neither distinctly urban or rural but something 'in the middle' or 'in-between' and *have specific spatial and programmatic features that do not fit the classic urban–rural dichotomy* (Garreau 1991; Sieverts and Bölling 2004; Viganò 2001). Most importantly, *intermediate areas* can't be read as "simply places of intensification of urban functions in the rural environment or places of interaction of urban and rural territories".

These paragraphs aim to give some insights and clarifications about the meanings, the definitions and the slippery boundaries of this notion and context.

First, In the wake of an incipient academic interest (Wandl et al 2014; Lanzani et al 2021; Lanzani 2020; Caramaschi et al 2024, Curci et al 2023), the definition of intermediate areas is thus outlined 'by subtraction': neither metropolitan areas nor inner areas: within the scenario of intermediate areas various labels that the sociology of the territory has long explored converge. These are medium-small towns, diffuse Italy, the rururban, urban fringes and according to various interpretations they also include peri-urban and suburban areas within a concept of continuum (cf. fig 8)
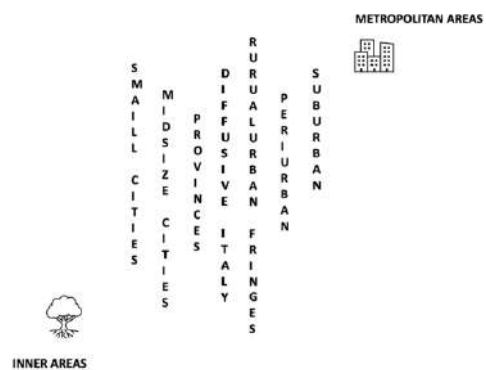
Figure 7: Authors elaboration: The intermediate continuum
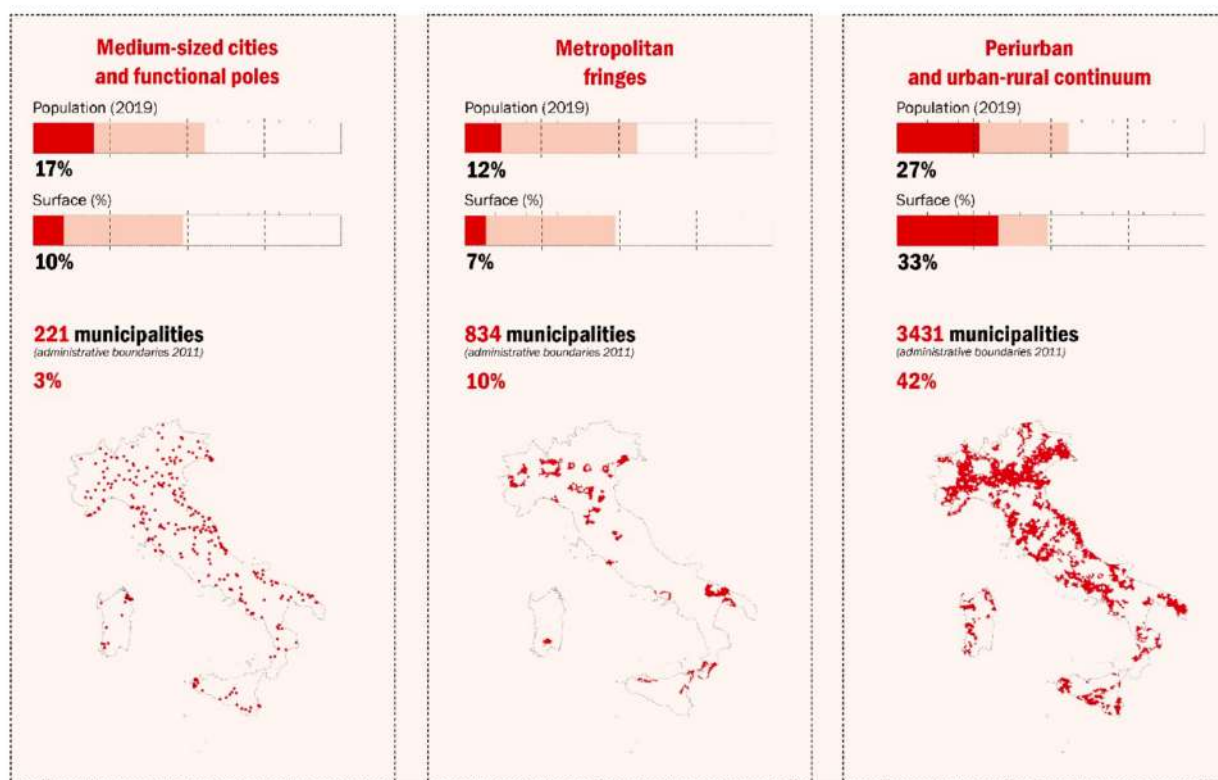
Figure 7: Three settlement typologies of the intermediate identified by Curci et al 2023 p. 94

Given the ongoing dynamics of urbanisation, in which the distinction between *urban* and rural is complexified, in virtue of more complex agglomerations of meaning, studying the terms of the average city may thus seem unexciting precisely because of this difficulty in making it a specific object of research. However, what is interesting is precisely the *median*, pivotal character that risks being lost and confused within research metrics either exclusively aimed at a certain type of urban or aimed at rural areas.

From this perspective, it is possible to frame the central role that the complex and deep-rooted network of medium-small cities has played in the European context. In other words, medium-small towns have constituted the skeleton of the European urban landscape and its historical configuration (Bagnasco and Le Gales, 2001), and in this sense it can be said that Europe «is a land of ancient medium and small towns, Italy being a particularly significant piece of it» (Trigilia 2014).

Indeed, the main difference between European and US cities lies in the relatively high proportion of the European population living in small and medium-sized cities and the stability of this pattern over time (Piorr et al., 2011) Not, only small and midsize cities, if compared to the US, only 9.5% the US population lives in CUs (CENSUS, 2010), while in Europe, depending on the definition, up to 50 per cent of the population lives in the so called *intermediate* territories (Wandl et al 2014).

The Italian territory is strongly characterized by the history of the cities that have constituted it since the communal era, a very dense, complex network of large, small and medium-sized cities on the plains, sea and hills, with highly articulated and polycentric territorial hierarchies, with a strong variety of cultures and landscapes (Magnaghi 2010 p. 26).

Given the specific settlement characteristics of the Italian urban system, however, the relationship between these processes of city expansion cannot be considered in relation to that historical fabric of medium-small urban permanence. The processes of urban *diffusion* in Italy do not thus follow a linear process of enlargement of the core area but are grafted on from more or less small-medium rural pre-existences with which they are confused and fragmented.

In addition to this, it becomes clear how, in the European context, the processes of urbanisation and suburbanisation are linked to this network of socio-territorial pre-existences with which they con - fuse. Suburbanization, peri-urbanization are not only the process of overflow of the city out of its "boundaries" but results of a more complex relationship in which medium-small cities and pre-existences are a relevant actor.

With such persistence a relationship of interdependence is outlined that involves not only the distinctly metropolitan core areas but the dense network of medium-sized cities that characterise the polycentric Italian landscape.

Looking at a global scale, it then becomes crucial to address the complex relationship of (inter)dependence between medium-sized cities, intermediate areas, and global city-regions - an internal/external relationship that has to do with the different scales of economic and power concentration, with the different urban narratives and ideologies at play, and with the complex mobile flows.

This leads to an urban and regional polycentric process that is also constantly being redefined '*from the middle*' and that claims increasing scholarly interest. In this sense, most of the time in literature *regions*, *city regions* and the process of *metropolization* is explored «from the perspective of the core city of the region and simultaneously to collapse the 'other' cities of the region into the core city experience » (Pendras and Williams 2021). Also, in this sense is readable the need for *another – or other than that of the core city* - perspective in the urban process.

Indeed, if we consider territorial landscape from a continuum perspective, we would notice that outside the urban core and rural/inner areas there's a complex and heterogenous scenario that is hard to ascribe in a common definition. As seen, if literature has largely empathised the importance of the cities as place of transformation and innovation, and on the other hand a large literary, political and discursive interest is growing about inner areas, what remains aside and outside these two definitions and landscape struggles to be at the centre of urban inquiry and representations.

The 'ideal' type of dense and compact city with its own well-defined centrality both on the planning and policy sides, albeit with different forms from the US modalities, is also coupled in Europe and in Italy by the composite phenomena of sprawl (Petrillo 2009 in Nuvolati and Piselli 2009) which, in literature and in practice take on forms and notions ranging from the belt to the hinterland, from suburbanisation to peri-urbanisation, from the 'diffuse city' (Indovina 1990; De Matteis 2001; De Matteis and Governa, 2001; Mela 2002; Debernardi, 2002; Bertuglia, Starghellini and Staricco 2003; Detragiache 2002; Nuvolati Piselli, 2009; Colleoni, 2019; Vicari Haddock, 2004), up to the so-called "Po Valley Megalopolis" (Turri 2000). A gradual process whose temporal boundaries are not marked by 'events' but by gradual transformations. In the same way, it is not useful to evoke «univocal models of urban dispersion in advanced countries, one can speak of an articulation of forces that push in the

direction of spatial decentralisation and of forces that instead re-centralise, drawing a multiplicity of tensions and tendencies of the present space» (Petrillo 2009 p. 32).

In this sense, what it is important to underline is that

> in the United States, the urban pattern is related to sprawl, understood as low-density, car dependent, monofunctional residential development. In Europe, the urban pattern has followed the form of intermediate territories, mixed open and urban land at varying densities, intersected by infrastructure, including public transportation. In Europe, urban development tends to be less monofunctional with mixed uses, especially at the regional scale. (Wandl et al 2014 p. 56).

Inside intermediate areas

As highlighted before, the notion of *intermediate areas* is slippery, with several angles on that. In this work we assume the perspectives of a *residual* definition of intermediate areas where the several urban forms just outlined converge in a same interpretative frame.

As mentioned, intermediate / in – between territories are widespread in the European context and according to the many forms that they assume contextually they assume several different names and classifications. The many names given to the form of spatial development in territories-in-between reflect its pervasiveness across Europe as well as the particular context in which it is discussed, the difficult of translation of them across language give, moreover, the idea about the local embeddedness of the terms.

A translation of the non-English terms is not given so as to preserve the meaning embedded in the original language. They include: Zwischenstadt (Sieverts, 2001), Tussenland (Frijters et al., 2004), city fringe (Louis, 1936), Città diffusa (Secchi, 1991), territories of a new modernity (Viganò, 2001), Stadtlandschaft (Passarge, 1968), shadowland (Hamers in Andexlinger et al., 2005), spread city (Webber, 1998), and Annähernd Perfekte Peripherie (Campi, Bucher, & Zardini, 2000).

But not only, literature take in consideration as well the notion of *secondary cities* as relevant (Pendras and Williams 2021) in the definition of an *intermediate scenario* (cfr p. 151). These labels can be put, moreover, in dialogue with other notions where is visibile a turn to greater attention on 'ordinary' cities (Amin and Graham, 1997; Robinson, 2002, 2008), on the small cities (Bell and Jayne, 2006), through shrinking cities (Fol, 2012; Wiechmann and Pallagst, 2012; Mallach, 2017), legacy cities (Mallach, 2012; Hollingsworth and Goebel, 2017) towards 'left behind places' (Hendrickson et al, 2018), 'places that don't matter' (Rodríguez-Pose, 2017). All these labels (tab 5) help to focus the

scientific and public attention on other scales of relational urbanities and current living practices. Important as well, especially in the international literature after the growing importance of authors such as Florida (2002) and Glaeser (2011) in the discursive making (but not only) of the contemporary city (Rossi and Vanolo 2012) is the interest on cities otherwise understood to fall outside the usual emphasis on global winners.

Following table (Wandl et al 2014 p. 53) resume some of the main labels literature refers as "in the middle", "intermediate", or "in – between", for space reasons it is not possible to give a complete portrait of all these concepts.

Table 8: Characterization of in between territorie according to Wandl et al 2014

Concept	Country authors	Summary of approach and explanation
Annähernd Perfekte Peripherie	Suisse Campi et al. (2000)	Campi et al., describe the territory between Zurich and its airport as one example of an area with a new form of urbanity, characterised by a heterogeneity of fragments of urban and rural land uses. They come to the conclusion that such areas cannot be described as periphery but form an autonomous city, the 'Glattalstadt'.
Tussenland	Netherlands Frijters et al. (2004)	The term *Tussenland* (Dutch for in-between land) arose from research done by the Dutch National Environmental Agency that aimed to identify and raise awareness of territories-in-between for Dutch planning practice. It focuses on the manifoldness of actors interacting in the production of the *Tussenland*, developed in the shadow of Dutch spatial planning which has given priority to the containment of cities and protection of green spaces over recent decades.
Città diffusa	Italy Indovina (1990) Secchi (1991)	*Città diffusa* describes the dispersed urban development of parts of the Veneto Region in northern Italy and its distinct urban form and socio-economic condition. The fine-grained character of its urban structure is the basis for its spatial diversity and decentralised but heavily interconnected economy, supporting a variety of lifestyles.
Territori della nuova modernità	Italy Viganò (2001)	In *Territories of a New Modernity*, a spatial development strategy for the Salento region in the province of Lecce in southern Italy, Paola Viganò and colleagues explain the porosity of the landscape as a driving spatial property for future development. They stress that in the *Città diffusa* an approach that focuses more on relations than on functions and that understands the landscape as the major infrastructure, offers more possibilities for local and regional development than traditional plans that primarily concentrate on the cites.
Urban fringe	England Gallent, Bianconi, & Andersson (2006)	In a series of articles from 2000 to 2006 Gallent et al. describe the English urban–rural fringes and their planning challenges. They investigate the role (or not) that planning played in 'urban fringe' development in England. They explain the struggles of an urban containment orientated spatial planning with areas where urban and rural uses intermingle. They conclude that, while spatial planning in the UK focused on the containment of cities and the separation of urban and rural land uses, the edges of cities evolved into a mixture of less favoured urban uses, agriculture and other rural land uses.
Zwischenstadt	Germany Sieverts (2001) Sieverts and Bölling (2004)	The term *Zwischenstadt* (German for in-between city) was introduced by Thomas Sieverts in the late 1990s to describe a new emerging type of city that is in-between on three dimensions: between built and open landscape; between the local rooted and global economy; and between recent young urban development and a yet unknown urban future. He argues that a better understanding of the *Zwischenstatd* is the base for planners and designers to contribute to its 'qualification'.
TyrolCity	Austria Andexlinger et al. (2005)	TirolCity is a provocative study of the State of The Tyrol in Austria taking the scenario of the whole federal state being seen as one city (TirolCity). The study investigates what this paradigm change would mean for planning for an area that has a traditional self-understanding as an 'Alpine rural landscape idyll'. The authors conclude that large parts of the Tyrol are a territories-in-between.
Sprawl	For an overview of definitions see (Bruegmann, 2005)	There are manifold definitions of sprawl, in this article the following is used: sprawl is a land development pattern that spreads residential units over a large area [. . .] sprawl also encompasses the separation of residential from commercial land uses, the absence of clustered development of town centres, and reliance on the automobile (Dreier, Mollenkopf, & Swanstromm, 2004, p. 59).
Peri-Urban	France Le Jeannic and Vidalenc (1997) EU Piorr et al. (2011)	The term Peri-urban is from French origin, and is used in to identify the wide territory of urban diffusion around urban centres. Only recently, it entered the planning discussion within the EU, primarily through the PLUREL project, which defines peri-urban areas as discontinuous built development, containing settlements of less than 20,000, with an average density of at least 40 persons per km^2. Together with the urban and the rural hinterland they form the rural–urban region

Moreover, looking at the international contexts, two points are relevant to mention in the conceptualization of the intermediate scenario. Indeed, If in the international and US context as mentioned *urban sprawl* is a key feature is the *intermediate scenario* carachterized by low-density urban dispersion with segregation of employment and residential development. It is associated with

very negative views of urban development including in particular high car dependency and major traffic infrastructure such as highways and extensive car parking. In the European context, Couch and colleagues understand 'sprawl, not as a pattern of urbanisation, as it is more common in the literature, but rather as a process of urban change' (2007 p. 4). This is preliminary of the conception of territories-in-between as « more than just the intensification of urban uses in the rural» but with key spatial and demographic features, as argues by Wandl and collegues (2014).

Looking for the cartographies of *intermediate* scenarios at the European level is not possible not to mention the official classification from OECD that, although within a conception urban vs rural identify *intermediate* regional typology based on NUTS3, starting from the thresholds of population density within a specific spatial entity as the organizing factor but not by functional criteria such as commuting' (OECD 2010 p. 3)[8].

As following maps highlight (Map 8, 9, Table 9, Graph 3), Italy, especially compared to the other European countries is mostly characterized by *intermediate* areas, also considering this classification. Limits of this classification can be found in the too thick grain of the units considered (NUTS3) that do not allow one to look at the territory in its complexity. Indeed, as argued in literature (Wandl et al 2014) the aggregation NUTS3 can be considered an useful lense only for administration issues but it risks *gross overgeneralization*. Other taxonomy and classifications are needed in order to understand the territorial complexity and to better addressing the contextual claims and needs in support of spatial planning, policy and action. Following paragraph will give some insights about Italian elaborations from the perspective of *intermediate contexts.*

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[8] The OECD method first classifies local administrative units (LUAs) (mostly municipalities) with a population density below 150 inhabitants per square kilometre as rural. In a second step, these lower level units are aggregated to higher administrative levels (TL3). Classifying as: predominantly urban (PU), if the share of the population living in rural local units is below 15%; intermediate (IN), if the share of population living in rural local units is between 15% and 50%; predominantly rural (PR), if the share of population living in rural local units is higher than 50%. In a final step the predominantly rural units according to steps 1 and 2 are reclassified to intermediate where they contain an urban centre of more than 200,000 inhabitants. Similarly predominantly intermediate areas are reclassified to predominantly urban areas if they contain an urban centre of more than 500,000 inhabitants. In both cases this only applies if the population of the urban centre is representing at least 25 per cent of the regional population.
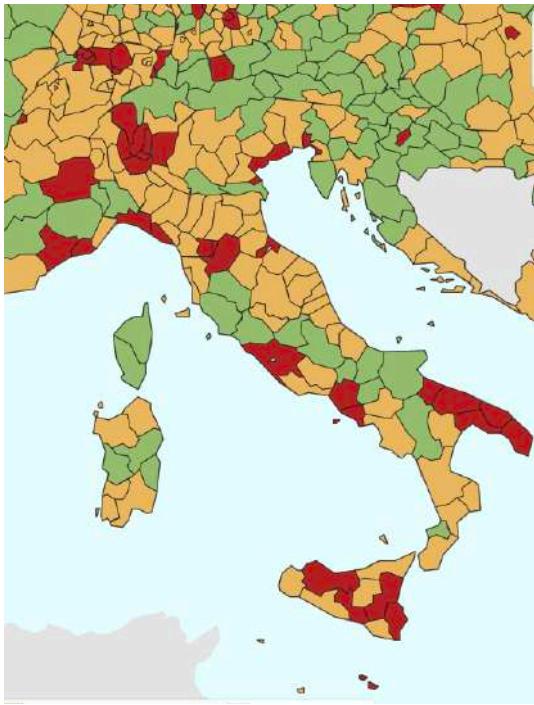
Regions | Cities | Metropolitan | **Urban-rural** | Degree of urbanisation | Border | Coastal | Island | Mountain | Outermost

Urban-rural typology, by NUTS 3 regions
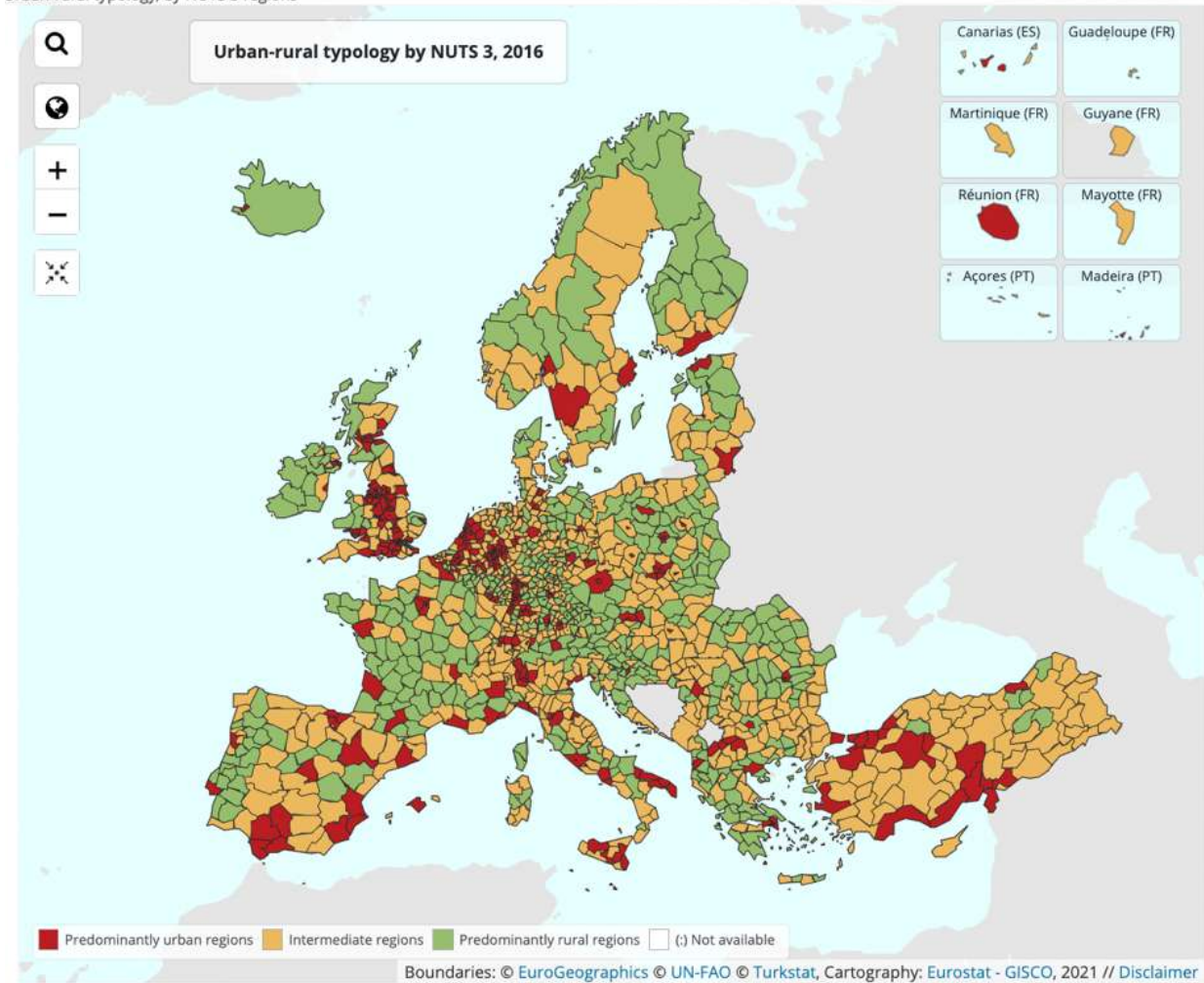
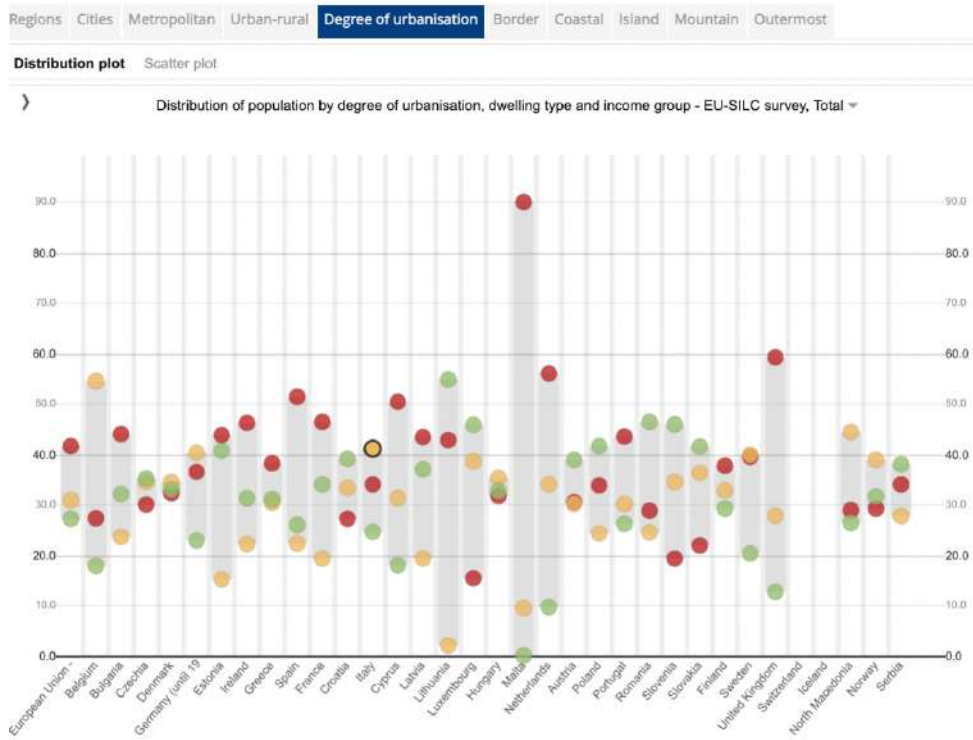*Map 8: Urban - rural typology by NUTS3 regions. Source: OECD*

Italy	
Predominantly urban regions (%)	36.48
Intermediate regions (%)	43.26
Predominantly rural regions (%)	20.26

Table 9: Urban - rural typology by NUTS3 regions. Focus: Italy. Source: OECD

Map 9: Urban - rural typology by NUTS3 regions. Focus: Italy. Source: OECD

Graph 3: Distribution plot. Distribution of population by degree of urbanization, dwelling type and income group. Source: OECD

The concept of 'secondary cities' is both intuitively obvious and empirically slippery. Everyone seems to know what secondary cities are; they are the other cities, the less recognized, less celebrated cities you haven't heard of, located just next to the famous cities that gather all the attention. Secondary cities aren't suburbs, or edge cities or the storied hinterlands that nurture the metropolitan hordes.

'Secondary cities' are defined as cities that fuel, compete with and are otherwise relationally connected to larger and putatively more 'successful' neighbouring cities, but which simultaneously maintain a degree of independent history and identity that mitigates against uncritically collapsing them into the mass of the 'city-region'. In other words, these can be thought of as regional secondary cities, and our emphasis is on intra-regional relationality, considering the relations between 'primary' and 'secondary' cities at the regional scale. This intra-regional dynamic, we argue, warrants more attention than it has thus far received from urbanists. Second, we recognize that the term 'secondary cities' threatens to evoke urban hierarchies in ways that have been unproductive in the past, particularly for the way they tend to advance 'a competitive approach to city development ... [that] privileges the interests and activities of a small sector of the city economy' (Robinson, 2005: 760). We nevertheless continue with this language purposefully to acknowledge differential positionalities within regional political economies. In the burgeoning wave of inter-urban (and inter-regional) competition for mobile capital investment, some places are better able to capture investments and desired resources than others (Partridge et al, 2009; Jonas et al, 2017). We seek here to challenge some assumptions about how 'winning' and 'losing' that competition are defined and envisioned, and to consider alternative development priorities for cities.
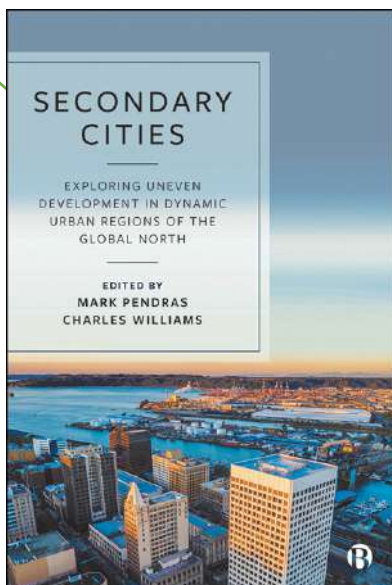
Box 6: Secondary cities. Source: Pendras and Williams 2022 p.2

Looking specifically at Italy, as mentioned in the introduction, geographies of Italian *intermediate areas* emerge from the subtraction of both metropolitan and inner scenario. In line with the international gaze, it is characterized by a rather heterogeneous demographic and settlement composition. As mentioned, in the intermediate scenario are recognizable midsize town, urban – rural continuum that are clearly something else fromt he metropolitan core. Nevertheless at the same time, for some scholars, figures such as urban fringes, suburban, periurban areas can be considered as part of an *intermediate scenario* although the functional and typological ambivalence.

Literature (Lanzani et al 2022) highlight three main components that compose the *intermediate italian scenario.*

First, the rich and pervasive network of historical small and midsize towns, partially related to the *provincial capoluoghi,* centres providing services and functions on a local scale, hubs of agro-industrial territories, with a traditional service structure. They cover a broad spectrum of demographic contexts from 20.000 inhabitnts, up to the more densely populated centres such as Brescia of 200,000 inhabitants.

Secondly, in the Italian intermediate scenario can be recognized territories that are marked by consistent urbanization phenomena, Italy can be defined as *conurbated*, the scenario of the diffuse city: functionally integrated, similar to a 'mineral' construction, in which parts of the territory have solidified and undergone metamorphosis.

> Dal punto di cartografico, sorvolando l'Italia, vedremmo scenari abbastanza diversi: parte del sistema costiero italiano dalla Liguria alla Calabria attraverso le Marche e gli Abruzzi, una geografia interna fatta di conurbazioni di pedemonte e di fondovalle, con insediamenti storici a mezza costa, alcuni ambiti con originali conurbazioni di pianura slegati dalle città capoluogo quasi sempre in corrispondenza della geografia di alcuni distretti industriali e infine una quarta condizione di estremo margine metropolitano: una nebulosa che la letteratura internazionale chiama "regioni metropolitane"[9].

Last scenarios attributable to *middle Italy* are the *overworked and exploited countryside*, the rural flatland and low hills, the 'Italy of extensive, industrialized agriculture.

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[9] Trad: From a cartographic point of view, flying over Italy, we would see quite different scenarios: part of the Italian coastal system from Liguria to Calabria through Marche and Abruzzi, a geography made of piedmont (pedemontano) and valley bottom conurbations, with historical settlements along the coast, some areas with original flat conurbations detached from the capital cities almost always corresponding to the geography of some industrial districts, and finally a fourth condition of extreme metropolitan margin: a nebula that international literature calls 'metropolitan regions'.

If we exclude metropolitan and inner Italy, the geography of Intermediate Italy (Italia di mezzo) emerges. Due to its large size (70 % of the national surface area), this Italy is characterized by a rather heterogeneous demographic and settlement composition.

A review of the municipalities of intermediate Italy reveals that they are primarily classified by ISTAT as inland hill towns (35 percent). However, a closer examination reveals that the majority of Italy's lowland (84 percent) and coastal (68 percent) municipalities are situated in middle Italy. This is also attributable to the fact that middle Italy constitutes approximately 70 percent of the national territory, of which half (35 percent) corresponds to the "sparsely populated urban-rural continuum" as previously defined.

Caramaschi and colleagues (2024, GRINS 2023) elaborated a taxonomy of Italian municipalities in which intermediate areas are selected as follow:

● Remote sparsely populated inner: 1024 municipalities

● Remote inner with medium population density: 127 municipalities

● Nearby sparsely populated inner: 177 municipalities

● Nearby inner with medium population density: 31 municipalities

● Mountain/hilly urban-rural continuum, sparsely populated: 2311 municipalities

● Mountain/hilly urban-rural continuum, medium population density: 841 municipalities

● Coastal and/or plain urban-rural continuum, sparsely populated: 979 municipalities

● Coastal and/or plain urban-rural continuum, medium population density: 788 municipalities

● Medium-sized city or non-FUA capital: 91 municipalities

● Metropolitan fringe: 969 municipalities

● De facto metropolitan hub: 11 municipalities

● De jure and de facto metropolitan area (non-capital): 543 municipalities

● Metropolitan capital: 14 municipalities

Map 10: Taxonomy of the 13 subclasses resulting from the classification of Italian municipalities elaborated by GRINS project (2023)

Map 11: Classification of Italian municipalities in intermediate, metropolitan and inner Source; Caramaschi et al 2024, GRINS project

3.4.2   The *city outside the city* as *intermediate* transformation process

As seen, the notion of intermediate take in consideration the *multiple* form of the city, including the so-called process of *the "city outside the city",* for these reasons following paragraph give a sight on this. First this is delineated in its main theoretical features, questioning in the end the big weight given to the *word city* in the last decades Urban Studies literature. Box previously presented (pp 133) outline the specificities on the Italian suburbanization and urbanization process.

In the light of a conception of territory as a dynamic process, we can see how territorial transformation is an inherent characteristic of processes involving territory and territoriality.
As mentioned in the first chapter, main literary interest has been captured by the processes of metropolitanizzation, urbanization and regionalization, especially in the regard of the genesis of the contemporary metropolis. This interest has been functional to frame intermediate and in between areas in the current urban process since literature deeply interwined intermediate areas with post metropolitan contexts. This paragraph in this sense is aimed to look at the metropolitan process specifically from the *intermediate* perspective. Looking at these aspects and conceptualization is convenient for the work to starting to approach the issues of *intermediate areas* that nowadays much literature intervened.

The process of metropolitanisation can be considered as a process of territorial transformation. Nevertheless, some interprets see the *metropolitanization* as the very negation of the city and the objectification of the territory, a reduction to function, with the consequent progressive decoupling of networks from proximity (Magnaghi 2010). The *metropolis* form would be the very negation of the city as a form of «destructive urbanisation». Risks related to the *big metropolis* rely in the liberation of places from the constraints of spatial proximity, «it would live and grow by ignoring and destroying the capacity of its environment to reproduce itself» (Magnaghi 2010). Limits of the *metropolis/ deterritorialisation* would also take place in terms of the destruction of the memory and biography of a territory', crucial as the previous chapter highlighted (3.1.2).

The difficulty in reading territorial transformations due to the insufficiency of tools able to describe the dynamics outside the municipal and administrative statistical grids is a knot that has been dragging on for decades.
Already Martinotti (1993) in his famous Metropoli highlighted the difficulty of identifying specific characteristics of the process of territorial transformation underway. It has been

highlighted in the Italian context also in relation the *regional* and *provincial* contexts (Clementi, Dematteis and Palermo 1996 p. 7) in terms of non-correspondence between the administrative boundaries and the effective articulation of residential forms and local societies. A new *blurred* city is delineated in which the phenomena of suburbanisation and peri-urbanisation are framed as strictly urban and metropolitan phenomena.

In this sense, the transition from city to metropolis, the 'new becoming of the metropolis city' was highlighted by Martinotti (1993 p. 14) in these terms:

> via via che la città si trasforma in metropoli cade la definizione netta
> della differenza tra città e campagna

The city thus goes from being a nuclear object clearly distinct from the rest of the territory, often delimited by walls that visibly established a marked division with the rest of the territory, towards urban agglomerations, conurbations, metropolitan areas. The urban character and density gradually faded into the 'countryside' without there being a clear boundary between urban and rural spaces any longer (De Matteis 2003).

In this sense, Martinotti spoke of the city as an «ambiguous object», whose geometry varies according to the criteria adopted to delimit it. This raises the issue of the geographical, functional, symbolic and relational limits of the city's becoming metropolis. In the city's becoming metropolis, there is no doubt that some local histories decay along with administrative labels that are now functionally unrepresentative of processes and practices.

What much literature has highlighted as obsolete are the administrative boundaries underlying the social, political and economic processes of the territory. In fact, the administrative regulation of territorial processes suffers from a scheme of competences that is not always up-to-date with the de facto urbanisation territorial continuum as well as with exchange and flow practices. A need, therefore, to update boundaries and forms of integrated governance.

In other words, these changes take the form of the 'crisis of the relationship' between administrative boundaries and the actual socio-economic and functional areas within which processes and relations extend, the so-called *de jure city* and *de facto city*.

To sum up, the topic of metropolitanization and urbanization in related as well to the potential redrawing of the relationship between the map of spatial practices, the administrative map and territorial competencies in terms of the renegotiation of interpretative and organizational categories of space. In other words, this aspect help us to see how much administrative boundaries themselves

are subject to the historicities of epochs and the risks of becoming no longer current descriptors of the settled and mobile practices of subjects, of the built continuum, with reverberations in the application of local policies.The shift and the transformation of boundaries and belongings consider as well the very notions of city, region, urban and territorial whose properties as defined units of measurement are revised toward different perspectives whose labels range between "polynuclear metropolitan regions" city-region, mega-city, mega-city region, polycentric metropolis (Hall & Pain, 2006), infinite city (Bonomi & Abruzzese, 2004), planetary urbanization (Brenner, 2014), post-metropolis and regional urbanization (Soja, 2001, 2011a, 2011b, 2015). (for the Italian debate Balducci, Fedeli, Curci, 2017).

The first stage of Italian suburbanisation, between the 1950s and 1960s, is defined as the "linear" expansion of urban boundaries, to provide space for the new inhabitants attracted by the industrial growth.

Starting from the 70' and its crises, is highlighted a shift from 'agglomeration economies' proper of the industrializing city towards 'congestion diseconomies' (Detragiache 2002) due to the saturation of central urban space and increasing pollution.

Regarding the expansion processes of the city in the Italian context, Dematteis and Governa (1999) point out three ways of settlement development produced:

(1) through increasingly large rings around a main core, because of an exogenous impulse determined by the decentralization of people and economic activities from the core metropolitan area. This happened in the case of Turin, Rome, Naples, South areas and Milan. The second (2) is by "areal bands and patterns", typical of Veneto, Emilia and part of Tuscany. These are areas where growth is endogenous and it starts due to the presence of Small and medium-sized enterprises, described in literature as "distretti", that act as a driving force for diffuse settlement development, which often intertwines with the rural context. These areas were characterized by a high presence of 'spatial fixed capital', a large heritage of buildings and infrastructure: not only of the network of roads but also that of irrigation canals, aqueducts and energy lines, which allow the spread activities and residences location (cfr. Fabian e Pellegrini, 2012). The third (3) modality conveys a linear development along the coastline, (i.e. Liguria (Seassaro in Clementi, De matteis, Palermo 1996), or along the Tyrrhenian or Adriatic coast) or along an infrastructure: they are territories historically characterized by the *inland population* «le popolazioni dell'entroterra» movement towards the coast: this linear development is interspersed with intersections along the valley axes whose urban development guess the presence of highways and railways.

The process of counter – urbanization has occurred, scholars (Dematteis and Emmanuel, 1992; Mela, 2002; Davico and Mela, 2002) highlight, due to several reasons that can be synthetized in (1) renewal of historical and cultural potential of medium and small – size town, (2) the spread of infrastructures and the improvement of telecommunication systems, (3) the territorial redistribution of incomes and of the demand for goods and services for final consumption, (4) the increase in income of middle- class families looking for a single-family house (the single-family house that typically characterises this landscape), (5) the urban crisis in compact metropolitan areas, (6) the decentralization of production and the endogenous development of local production systems. Moreover, it is possible to highlight the (7) weakening of agricultural production.

All these innovations mean that people can benefit from the city's living and working opportunities without necessarily living in the city. In this regard, Mela (2002), echoing Giddens (1990), refers to the notion of «stretching» about the range of action of social subjects: the possibilities and the needs in terms of work, leisure and services cover an increasingly larger space. Leaving the city, in fact, does not mean losing contacts, opportunities and relations. This lifestyle has been defined by scholars as «reticular lifestyle» (Bertuglia et al, 2003). The new possibilities associated with the «freedom of movement» have led French sociology (Chalas, 1997) to speak of «ville a la carte», whereby each person outlines his or her «own city», according to personal tastes and needs.

To summarize, starting from the second half of the 1970s, a progressive trend into urban diffusion is outlined, in terms of settlement dispersion, which is measured in the first instance in terms of suburbanization towards the "first and second belt", up to phenomena such as periurbanization (cf. Colleoni, 2016 p. 68; Caiello Colleoni, 2013) in which the path of urban diffusion does not follow a linear process and expansion of the core area, but is based on small and medium-sized rural pre-existences with which it is confused and fragmented, a «chaotic assemblage» to such an extent to produce the image of a «random uniformity».

Moreover, some scholars give to this complex and unplanned enlargement of the urban to the rural areas the name of **«rurbanization»** (Mela, 2002). This, together with the low density of settlement and the extensive development of the territory, is one of the peculiar characteristics of this process, which involves the difficulty of organising an equally widespread public service, in terms of costs and benefits.

These constant connections with the urban core imply a strong demand for mobility that outlined a car dependent scenario where a "vicious circle" is inscribed: the "diffuse city" grows as the diffusion of the car increases and it is shaped on it.

Furthermore, literature shows how the space of the «città diffusa» is mainly crossed rather than experienced: the road is configured as the «main protagonist of the landscape» (Davico and Mela, 2002). Boeri, Lanzani and Marini (2003), highlight how the road is a «linear attractor» that supports the progressive alignment of a complex of buildings that often have little relationship with each other and interact little with the surrounding area, especially in rural areas.

At the turn of the 2000s, scholars (Mela, 2002; Detragiache, 2002) recorded what is defined as "a return to the city" in terms of an initial stop of the demographic decline in the metropolitan areas through the "economic revival of the cities", consisting, among other things, of the attraction of economic activities, high tech and of the higher tertiary sector. This happens in line with similar movements started two decades before in the Anglo-Saxon contexts. This is a non-homogeneous process with different times and places, and questions about which centers experienced these processes and how they contributed to the structure of new centralities and the production of new territorial hierarchies. At the same time, the hinterland continues to expand, becoming attractive only for the middle class, but also for lower-middle social classes.

In the same way, it is not possible to frame «univocal models of urban dispersion in advanced countries or a return to centrality tout court, but an arrangement of forces that push in the direction of spatial decentralisation and forces that re-centralise is described, outlining a multiplicity of tensions and tendencies in today's space» (Petrillo, 2009 p. 32).

This «revival of the city» is also connected to the great urban renewal projects that began in the 1990s (i.e. the Urban program), the policy of mega-events (examples: Genoa G8 2001, Winter Olympics Turin 2006, up to Milan Expo 2015), mega projects (Vanolo-Rossi 2011), and from an infrastructural point of view the High Speed rail project, which has its roots in the late 1990s.

A season of «new urban protagonism» which leads to recalibrating the issue of what model of city is "appropriate" within a now highly globalized scenario in which the dynamics of international competition contribute to the restructuring the territorial dynamics and scales. Moreover, the question concerns what relationship could be configured between the global nodes and the corresponding local areas. If the medium-small cities have played an important role in the territorial construction and in the industrial development of Italy, it is necessary to supervise how this role has been re-organised in the light of global dynamics.

It is therefore necessary to consider what role medium-sized and medium-small cities could play in the context of progressive competitiveness in which a small number of cities prevail in world economies (Sassen, 1994). Perulli and Garavaglia (2006) pointed out that «medium-sized and medium-small cities are unable to challenge in what is required at greater economies level of scale and in terms of diversification» (Perulli and Garavaglia, 2006 p. 65). They are not able to develop knowledge systems focused on higher education, nor «advanced and sophisticated services that require adequate size to locate such as high quality financial, legal and technical services, governmental organizations, headquarters of multinational companies, but also cultural life and the ability to attract and retain skilled international migrants» (Simon, 1995 in Perulli Garavaglia, 2006*).*

Box 7: Itineraries in the Italian urban process

The "**diffuse city**" (Bertuglia, Cristoforo, Staricco 2003 ; Davico, Debernardi, Mela, Preto 2002 ; Indovina 1990; Nuvolati Piselli 2009) deeply investigated by Italian urban literature can be outlined as a hybrid settlement form: neither city nor countryside, around the city at first, increasingly spread out later, characterised by a territorial diffusion of the "urban lifestyle" and by constant contacts with the central core, sustained by technological developments in telecommunications and the diffusion of the automobile, which represented more than a means of transport «a consumer good, both material and immaterial, and an instrument of liberation» (Colleoni, 2019 p. 64).

Box 8: The diffuse city

Periurbanization / periurban

Also the notion of Periurban has gained lot of interest from scholars in recent decads. It is not configured as an «transitional areas located between town and country, but rather as new and merging forms of 'urbanity', that bring into play new lifestyles, new mobility behaviors and new urban issues» (Pucci 2016 p 232).
Moreover, it can be defined as a territory characterised by an intermediate level of urbanity and a fringe location within complex urban systems (Caiello Colleoni 2013).

According to literature three dimensions useful to conceptually define the peri-urban:
1.   Territorial dimension given by the size and density of residential, productive and service settlements
2.   Relational dimension in which territorial centralities, mobility of inhabitants, urban congruity converge
3.   Socio-economic dimension that looks at the economic sectors, modes and lifestyles of the inhabitants

Crucial in the understanding of the periurban phenomena is the EU project on Peri-urban Land Use Relationships – Strategies and Sustainability Assessment Tools for Urban–Rural Linkages (PLUREL). According to the project periurban areas are operationalized as «discontinuous built development, containing settlements of less than 20,000, with an average density of at least 40 persons per km2 (averaged over 1 km2 cells)» (Piorr, Ravetz, & Tosics, 2011 p. 10). Together with the urban area (continuous urban areas and cities with over 20,000 population) and the rural hinterland (less than 40 inhabitants per square metre) they form the rural–urban region (Piorr et al., 2011 p.25). To sum up, in the polycentric version, the peri-urban areas do not only surround the urban, they are also a geographical type and territory unto their own', and that 'the reality on the ground is often complex and fast changing' (Piorr et al 2011 p. 25).

Box 9: Periurbanization / periurban

3.5 Intermediate dynamics

> L'Italia di mezzo è in contrazione: demografica, economica, istituzionale, amministrativa, economica e di visione. Come un muscolo che si contrae per un crampo e che non riesce così più a distendersi e a funzionare come atteso[10].

This paragraph outlines some points about the main dynamics described in literature that characterize Italian intermediate areas.

Since the multiple composition of the contexts, the paragraph will give at the same time some insights on specific pieces of intermediate (such as midsize cities), and in the *intermediate* areas in toto are considered.

Recently some scholars (Viesti 2021; Curci et al 2022) addressed the issues of territorial fragility in specific context intermediate areas know and crosses new challenges related to territorial fragmentations, demographic contraction and marginalization

> The simplest yet most significant indicator to capture the demographic contraction remains the percentage change in resident population, which in this case was between 2011 and 2019. It effectively signals how substantial portions of Italia di mezzo are now flanking inland areas in the dynamics of demographic contraction. The inland areas of Italy are confirmed as territories of contraction par excellence. However, the high internal variance indicates some counter-history. […] After years of growth, urban-rural continuum, especially in the suburban municipalities, has entered a contraction process.
> (Caramaschi et al 2023 p. 99)

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Looking at the dimensions of fragility Caramaschi and colleagues (2023) identify a number of relevant socio-demographic, socioeconomic, real estate, and environmental indicators that describe the state of middle Italy today and what its specific dynamics are with respect to metropolitan and inland areas. Here some results useful for the work are reported.

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[10] "Il voto del 12 giugno: territori in cerca di futuro" di F. Barbera and F. Lacqua, 22/06/2022, Rivista il Mulino
https://www.rivistailmulino.it/a/il-voto-del-12-giugno-br-territori-in-cerca-di-futuro (last visit: 26/09/2024)

This turns crucial in some definition of *intermediate areas* outlined before such as *places that don't matter* (2018), *shrinking cities* (Haase et al 2016; Caselli et al 2020; Coppola 2012; Martinez Fernandez et al 2012), *left behind places* (Gordon 2018; Hendrickson et al 2018): these label take the process of place - fragilization as a definitory variable of the *in – betweenness,* especially for those contexts downgrading or losing gradually functions and their extension in the sovra – local arena.

These are different processes respect the long-term depopulation that regard the inner and rural areas, because it regards contexts that knew important phase of social and economic expansion after second war. Following part of the chapter will give some insights about *intermediate dynamics* looking at demographical, economic, political, infrastructural perspective but also looking at the changing role of functions and services.

First, demographic dynamics are very important in the design of *intermediate* since the importance of the demographic threshold in categorizing territories.

According to Caramaschi and colleagues (2023), in intermediate Italy live around the 62% of Italian population, most of which in the "*urban - rural continuum with intermediate population density".* This population, according to ISTAT, slightly decreased between 2011 and 2021 (-1,3%), these regards all the subclasses presented by GRINS study for the exception of the *metropolitan fringes* (+0.8) due to the proximity to the *metropolitan cores.* Midsize cities, moreover, in the intercensary decade recorded a slight demographic contraction (-0,6%).
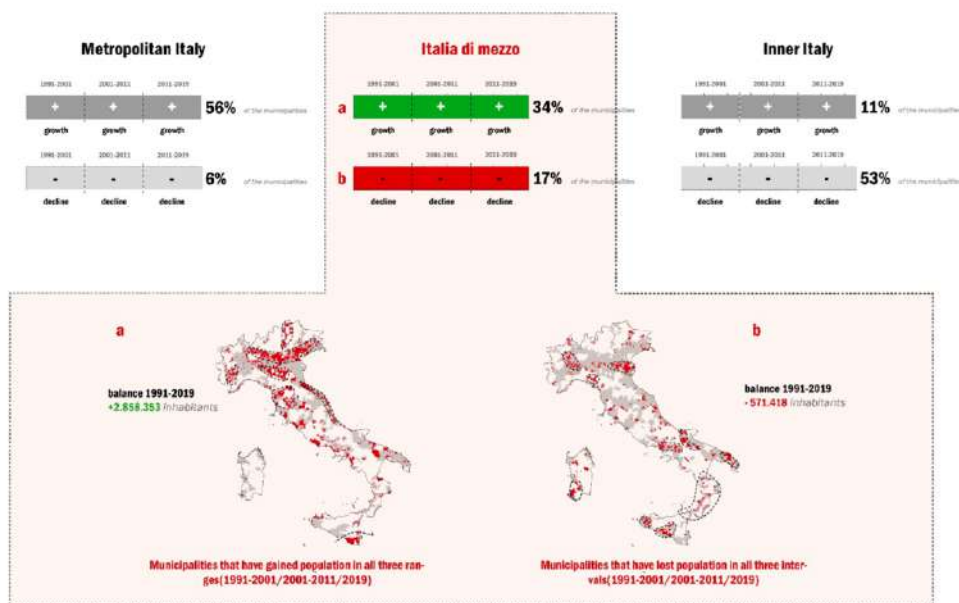
Map 12: Demographic dynamics in intermediate Italian areas. Source: Curci et al 2023 p. 101

Also ISTAT in the "Rapporto sul territorio" (Report on territory 2020 p. 73) refers to *intermediate Italy* (Italia di mezzo) dynamics looking specifically at the "Sistemi locali delle città medie[11]" (Midsize town local system). As will be argued in the methodological chapter this texture can be useful inreading territorial dynamics of intermediate Italy beyond municipal and provincial units. Istat identify 87 Local system distributed: 32 in the North, 25 in the Center and 30 in the South. According to this classification, population inside this scenario represent the 26,6% of Italian population and it increased between 2012 and 2020 1.81 per thousand per year on average. Nevertheless, it is underlined that the ageing population with data above the national mean (Table. 4)

Moreover, Caselli and colleagues (2020) in their study on shrinkage process on Italian midsize cities highlights the following five relevant factors in influencing the population loss in Italy:

Population ageing	The ageing index (the share of elderly people aged 65 and over)
	The old age index
Wealth/Poverty	Considers the uneven spatial distribution of average per capita incomes; in 2014 about 72 percent of the considered municipalities records lower per capita incomes than the national average.
Business Performance (BP) of Labour Market Area (LMA)	Indices of labor productivity
	Trade openness
	Export performance
Unemployment (U)	Resulting from the combination of employment and unemployment rates calculated both in the municipality and in the corresponding LMA
Peripherization (P)	Connected to the physical location (hilly or mountain areas are typically less accessible than plains
	Connected to the concept of accessibility to public services (schools, railway stations and hospitals) and infrastructures

Table 10: Main factors influencing population loss in midsize towns in Italy according to Caselli et al 2020

Lastly, for a full picture of the demographic evolution in Italy, it is possible to consider the analysis of Salone and colleagues (2016), which reconstruct the demographic evolution in the cycle 1951 - 2011 with the aid of the General Census of Population.

Secondly, economic aspects are relevant in the portrait and definition of *intermediate* areas in Italy. As described (Becattini 1998) the history of these contexts is deeply related to the production's dynamics. Indeed, it is well understood in long term literature the role of manufacturing districts in the definition of the *third Italy and of the diffusive city*. Given this, the main economic scenario of

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[11] In order to describe the dynamics of Italian medium-sized cities, ISTAT identifies Local Systems of Medium-sized Cities 'SL defined according to several statistical parameters (minimum demographic size, relevant and recognised administrative centre, presence of a hub offering essential basic services) (Forme, livelli e dinamiche dell'urbanizzazione in Italia ISTAT 2018)

intermediate Italy is specifically characterized by manufacturing districts and post productive territories, these elements are visible both as economic indicator, because of the strong manufacturing and agricultural vocation, but also as landmark of the landscape. According to some interpretation (Lanzani et al 2021) *intermediate territories* of Italy overlap largely with the productive and post productive (Bianchetti 2019) and this is a definitory element of them that pose specific challenges and issues, sometimes contradictory and coexisting, in terms of regeneration of spaces related, productive vocation (Fior et al 2022) and territorial policies. Issues about post productive scenarios, industrial districts and contextual drivers is a topic deeply investigated in literature and for this reason unpack these knots of literature goes beyond limits of the research. For a brief introduction to industrial districts and their role in the definition of intermediate scenarios in Italy please refer to box p. 117. To sum up, in 2011 about 90% of the municipalities included in the Italian industrial districts are part of intermediate areas of Italy (Curci et al 2022). Looking at the geographical distribution it is possible to observe a stronger manufacturing connotation in the whole of the centre-north and along the Adriatic coast than in the rest of the country.

To sum up, these diffusive territories are characterized by a large presence of small and midsize companies, the manufacturing sector employees' rate is significantly reduced in medium-sized cities. However, as authors underline, looking at the number of large active companies per 1,000 employees in the municipality in 2017, it is possible to see an inverted trend. The maximum values are reached in medium-sized cities and metropolitan Italy. A more pronounced presence of large companies emerges in the territories of Italia di mezzo along the Piedmont–Lombardy–Veneto foothills axis, along the Via Emilia and along the Adriatic route. On the other hand, the presence is limited along the course of the Po River, along the Tyrrhenian coast, in the south and on the islands. Alternatively, or sometimes in combination with manufacturing, there is also a solid agricultural connotation of Italia di mezzo: the percentage of the agricultural area used of the total municipal area in the urban-rural continuum is 56.6%. The geography on a municipal basis is complementary to manufacturing, with higher values in the lower Po Valley and some areas of Apulia and Sicily.
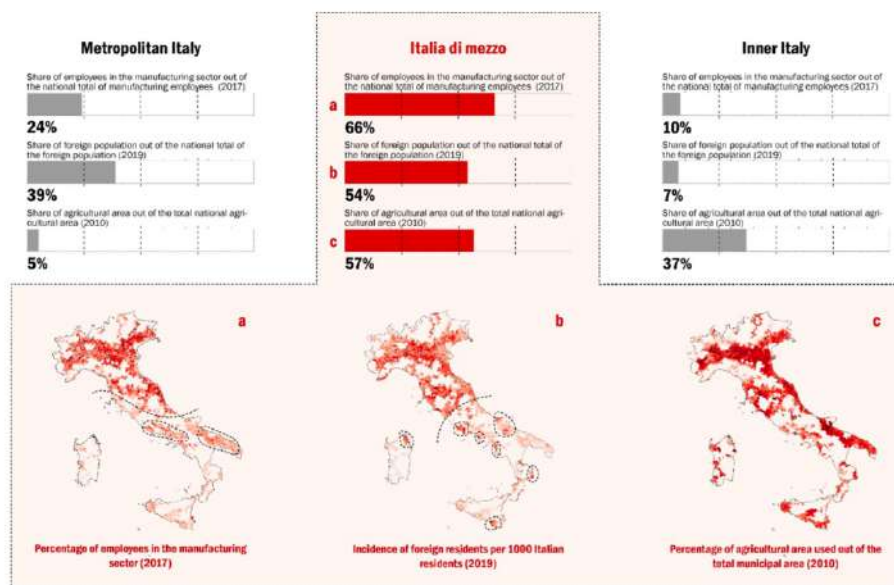
Map 13: Socio economic features of intermediate areas of Italy. Source: Curci et al 2023 p.95

Looking more specifically of the economic and productive connotation of the local system of midsize town (ISTAT 2020), three macro categories are highlighted. Firstly, the non-manufacturing SLs (46 SLs, in which 48.5% of the population live); secondly, the Made in Italy (25 SLs inhabiting by the 30% of the population), and thirdly, the heavy manufacturing (16 SLs inhabiting 21.5% of the residents in the SLs of medium-sized cities). In all, 37 SLs lost population, about 12,000 fewer residents between 2012 and 2018. In the non-manufacturing SLs, the negative population change affected almost half of the SLs (21 out of 46) and, in particular, the predominantly port-based urban SLs. Of particular interest is the Brindisi system, which recorded the largest decrease (-4.3 per thousand on average per year).

On the contrary, the multi-specialized urban systems register the best demographic performance, and a comparatively less significant population ageing process. Particularly noteworthy are the northern SLs: Rimini, Trento, Pavia and Bolzano, which record average annual growth rates of more than 4 per thousand.
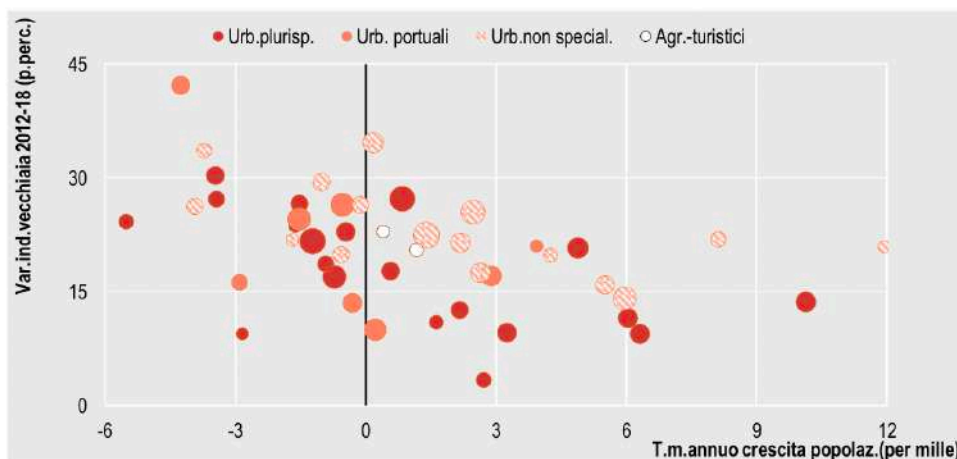
Graph 4: Population and old-age index in the LS of medium-sized cities by prevailing specialisation. Years 2012 - 2018. Average annual changes per thousand and percentage points. Source: Istat (2020)
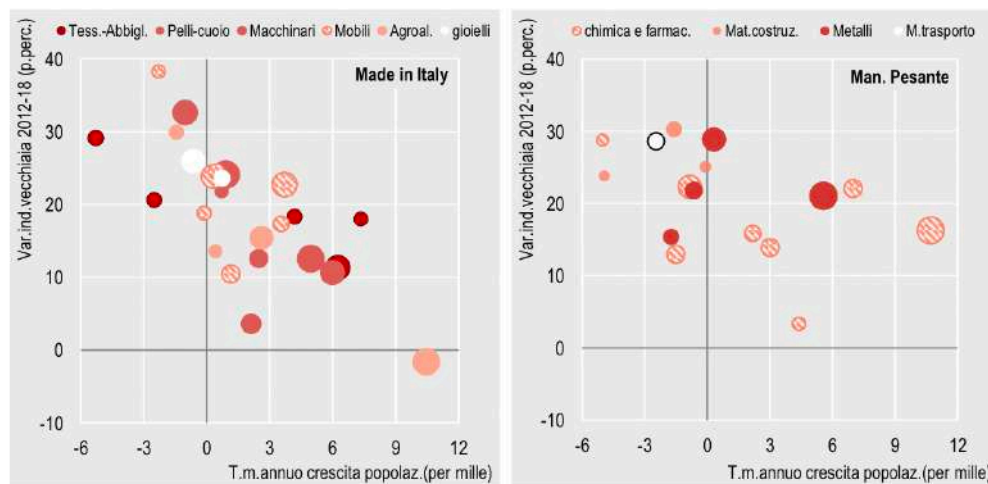
Graph 5: Population and old-age index in the sl of medium-sized cities and thinking manufacturing. Years 2012 - 2018. Average annual changes per thousand percentage points. Source: ISTAT 2020

Looking at some other data of the socio economic situation of intermediate Italy some elements are here reported. According to Curci and colleagues (2023 p. 97) a «less dramatic situation» compared to the other *Italies* is reported considering for example following indicators (i) the incidence of families with potential economic hardship where first, the risks sill follows the discussed North – South discomfort dichotomy and secondly the risks are more evident in metropolitan contexts, albeit with marked differences between municipalities (ISTAT 2011). Second indicator considered is (ii) the incidence of young people outside the labour market and training (ISTAT 2011) where main

values are reported for metropolitan and inner contexts. Nevertheless, the spatial location presents particularly critical situation between Biella and Alessandria, and in lower Brescia area.

Nevertheless, data shows areas of socio economic challenges regard more specifically Intermediate areas of Italy, albeit, as following map show, a worst situation is recognizable in *inner areas.* The one considered are: (i) the incidence of families in need of assistance (2011) (map 14) and (ii) the old-age index (2018) (map 15). These are recognizable in Piedmont, along the axis of the Po River, in Friuli-Venezia Giulia and central Italy, whereas the lower levels are found in the new Lombardy-Veneto-Emilia "industrial triangle" and in the south. Third relevant indicator regard (iii) the per capita gross income 2015 that show some distance from the metropolitan areas, albeit also in this case the North South dichotomy is still well visible (map. 16)
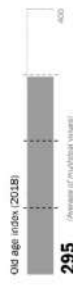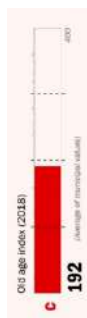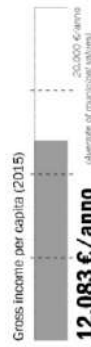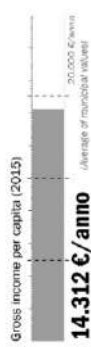
Metropolitan Italy

Italia di mezzo

Inner Italy

Incidence of families in need of assistance (2011)
(Average of municipal values)
2,4%

Incidence of families in need of assistance (2011)
(Average of municipal values)
3% a

Incidence of families in need of assistance (2011)
(Average of municipal values)
3,6%

Old age index (2018)
(Average of municipal values)
151

Old age index (2018)
(Average of municipal values)
192 c

Old age index (2018)
(Average of municipal values)
295

Gross income per capita (2015)
(Average of municipal values)
14.312 €/ anno

Gross income per capita (2015)
(Average of municipal values)
13.764 €/ anno d

Gross income per capita (2015)
(Average of municipal values)
12.083 €/ anno

a

Incidence of families in need of assistance (2011)

Map 14: Incidence of families in need of assistance distribution (2011). Source: Curci et al 2023 p. 97

c

Old age index (2018)

Map 15: Old age index distribution (2018). Source: Curci et al 2023 p. 97

d

Gross income per capita (2015)

Map 16: Gross income per capita national distribution (2015). Source: Curci et al 2023 p. 99

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Nevertheless, the highest disadvantage and fragile profiles in *intermediate Italian geography* regards environment and sustainability issues (map 18). Some indicators taken in consideration reveal high values regarding for example: (1) the percentage of municipal area occupied by sites of national interest (SIN) (2014), (2) the number of industrial plants with relevant risk of accident (RIR) (2015). This latter case concern for example the sites of Brindisi, Porto Torres, Ravenna, Alessandra, Novara, Ferrara, Cremona, Gela, some municipalities between Frosinone and Latina and the province of Terni are reported. Similar in the geographical location is also reachable in the percentage of the resident population at risk in areas with moderate hydraulic hazards (2017).
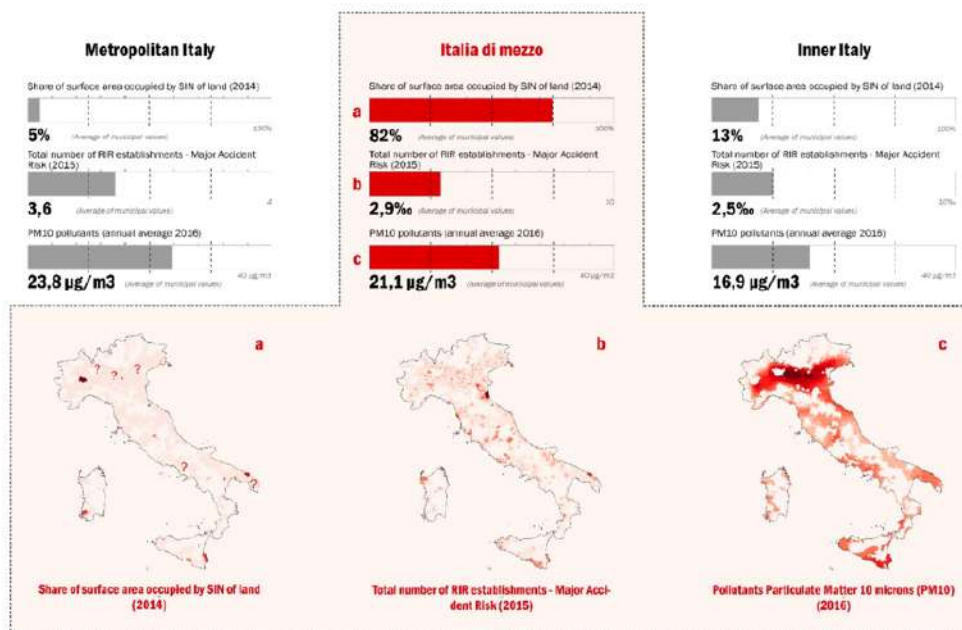
Map 13: Environmental issues in intermediate Italy. Source: Curci et al 2023 p. 100

Thinking about functions and services that characterize intermediate italian scenario there's no claim to exhaustiveness due to the relevance of the topic and the composite scenario seen above where several different paths about services and functions insist contemporary.

As seen in previous chapters, if we think of intermediate areas as midsize and small town the profile of services, proximity and urbanity is extremely different if compared to fringes and suburban areas. What is crucial here to stress is that a closer look at territories-in-between shows that, despite the dominant view, show that they are not monofunctional sleeping suburbs or simply areas only occupied by transport and logistics uses but exhibit a complex mix of functions. Particularly from a regional perspective the mix of uses often results in a surprisingly high level of functional diversity. Nevertheless, new challenges are highlighted in literature and regard closely the topics of the

research. As seen, services and functions touch closely issue of centralizations and hierarchization of spaces (3.2) and their presence and accessibility have a crucial role in the definition of territorial geometries. For these reasons change in the provision of services and the redefinition of territorial functions needs to be strongly considered. In this subject literature highlight the «continuing spatial decentralization of economic activity over recent decades» outside *intermediate territories*. This process is also supported in the literature by the analysis of Caramaschi and colleagues (2023) who, with regard to the decentralisation of middle Italy, speak of a loss of reference in the economic system also in light of the data on the percentage variation of employees. This confirms the trend towards territorial centralisation which is underway in Italy. Indeed, as reported, between 2012 and 2017, only metropolitan Italy and medium-sized cities saw an increase in employees, whereas other parts of Italy contracted. The maximum contraction is not recorded in inner areas, however, but specifically in urban-rural continuum. Of particular interest for the context of the research is that the geography of contraction sees the Biella-Alessandra axis and the Po River axis emerge. Moreover, Umbria and Calabria have a negative trend as well as the Marche-Abruzzo Adriatic axis and the Campania region.

To sum up, historically intermediate Italy, in its fully comprehension, have always been characterized by being service provision poles on a local and regional scale territorial reference point. Specific role of intermediate areas indeed has been to mediate among scales, junction between metropolitan and inner vocation of space. Recent processes that need more attention in literature pose the question about the possible future destinies of intermediate areas as necessary "bridge", "seat belt" and "node". As the empirical chapter will explore, railway services and stations are an interesting starting point for investigating the redesign of centralities, functions, position the scale geometry of *intermediate areas* (6.3) Although the importance of local context never allows a generalization of processes and phenomena.

Moreover, new political tensions are underlined in literature (Fedeli 2017) that regards closely *intermediate areas*, their definitions and challenges. Following paragraph will give some insights on these aspects. From this lens, the topic of the in-between territories has crossed the work of scholars who are involved in investigating the correlations between the geography of (electoral) discontent and places – often too hastily defined as peripheral – in which the perception of geographical disparities is stronger (McCann 2020) and in which socioeconomic and environmental conditions are condensed such as to induce some scholars to define them as places that don't matter (Rodrıguez-Pose 2018).

A general interest in the electoral behaviors of *provinces* is growing both from the scientific and the public[12] side since in last decades the gap between urban and *provincial* electoral preferences deeply increased building new political and administrative trajectories beyond historical geographies of the vote. This has been investigated at different levels and in different international (Gordon 2018) contexts: national (Rossi 2018 Di Matteo and Mariotti 2021), European in connection especially with *Euroscepticism* (Rodriguez Pose et al 2024 Dijkstra et al 2020), in the US (Monnat and Brown 2017), regional, but also at the neighborhood level.

Nevertheless, a recent study conducted on the administrative election of spring 2022 (Lacqua and Barbera 2022) shed the light on the lack of specific studies oriented on understanding the current political and electoral dynamics in midsize town and intermediate areas in Italy as a whole system in relation to the main ongoing territorial dynamics, crisis and transformations and overcoming the mere urban – rural distinction in electoral behaviors. This can be partially read as the consequence of the lack of a proper national policy for medium-sized towns that recognizes and supports their specific role in the Italian urbanization scenario. The importance of the analysis from this perspective it is also claimed in light of the role that these contexts have in a "large area" (area vasta), as not exceptional and autonomous poles, but as nodes of territorial systems that, as already mentioned, in their diversity, call into question the interconnections between metropolitan areas, medium-sized cities, productive areas, agricultural areas and natural areas. Moreover, the work in discussing the results emerged the always more visible the role of the *civic* political protagonism not always ascribable to a well-defined traditional political pole as much as a local interest. Another relevant aspect regards more closely the administrative framework. Indeed, the decentralization process of intermediate areas goes together with a potential drain of administrative and political competence – defined as metropolitanization of the political careers of the local executive elites, (Boldrini 2022) - that, without the rooting of intermediate bodies such as parties and unions risk to move faster towards cities and cores. This process happens in parallel with the need of more deep competences towards bigger challenges, transitions that require a deep specialization.

In addition to the points highlighted, one of the crucial elements characterising intermediate areas, as discussed in 2.1 is the specific relationship with infrastructure in defining their spatial organisation. As also specified in the international contest, consider the operational landscapes (Brenner and Katsikis 2020), the intermediate areas are configured as the scenography of mobility infrastructures. The space in which they are configured, the hubs and scenarios of passage, although this does not always correspond to greater accessibility than the central areas, precisely because they are the places

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[12] An interesting perspective on this is given by the interactive electoral maps edited by Youtrend: https://www.youtrend.it/mappe-elettorali-interattive-youtrend/ (last visit: 25/09/2024)

of passage rather than of stopping.This reflects their relational nature where, as explained in the literature (inter)connections are more relevant than spatial proximities. Looking at the fragility nevertheless, it is worth mention some of infrastructural system challenges. Indeed, over the last decades, this more visibly broke its relationship with nature due to the increase of the number of adverse events opening up the need of a gaze not only from the point of view of urban development and growth but especially of environmental recomposition and territorial safety (Lanzani et al, 2021).

3.5.1 Many faces of territorial challenges in *intermediate areas*

As has been observed, the articulations of fragility are differently rearticulated in the territorial dimensions that have been outlined. In metropolitan and core areas for example can be found the social infragilization of the most exposed sector of the population due to the higher prices especially in housing, processes of speculation with extra local big actors, gentrification and consequent expulsion of the fragile population, but also over tourism, pollution and congestion.

In the context of inner areas, certain factors warrant consideration. These include the long-term decline in population, inaccessibility accounts, and the environmental degradation resulting from climate change.

Lastly, as last paragraph pointed out emerging challenges and dynamics sometime not immediately legible are outlined such as depopulation processes, lack of representativeness, cultural fragility, but also pollution and accessibilities to specialized services.

To sum up, as mentioned and described in the previous paragraph marginalization is considered as multidimensional notion where different levels insist, according to Lanzani (2020) five levels of territorial fragility can be distinguished:

A. Demographic, b. Socio economic c. environment d. mobility and f. territorial social configuration as analyzed in the previous paragraph.

Following the notion from Lanzani (2020) territorial fragility can be considered as «a set of elements that can weaken a territorial system and a specific living environment», that is measurable in the failure of a territory to adapt to changes without losing vitality. In other words, «a fragile territory is more subject to unexpected shocks and events that increasing its fragility» (Vendemmia et al, 2021), fragility is thus conceived as the effect of different interdependent spatial marginalities in their dynamic evolution. A "fragile territory" is therefore described as a place where «more conditions of disadvantage exist, including but not exclusively geographical marginality» (ibid. p.2).

This allow to recognize that fragilities are not an inexorable condition of territories, but marginalities should be read in terms of construction and political production.

In line with this, Vendemmia and collaborators (2021 p.2) underline that marginality, not to be confused with peripherality, is not to be conceived «only as a state but mainly a process influenced by socio economic changes that can affect a particular region, either in a positive or negative way».

In this sense, only a technical approach in studying mobility infrastructure and dynamics of marginalization can't be enough but it needs a gaze where converge political, cultural, and technical scheme.

Many notions are relevant and related to the concept of marginality: the concept of territorial inequalities, fragility, shrinkage, downgrading and so on.

Figure 8: The many faces of the territorial challenges. Elaboration of the author on the literature

Main relevant is the notion of Territorial inequality that, starting from the pivotal *capability* approach (Sen 1999) considers er the capacity or incapacity of a place/ a territory to allow the same exercise of citizenship rights such as the access to public services, the possibility to move around, but also to attend schools and to access to the health care provision.

With *shrinkage* (Mallach 2017; Coppola 2012; Haase et al 2016; Aurambout et al 2021; Martinez Fernandez et al 2012) is described a key phenomenon in worldwide Urban Studies investigated since the early 2000s first in the U.S. context and then on a global scale as crucial of the current international dynamics of globalization.

Because its fascination it has been explored by various scientific disciplines, but also by artists, architects (Oswalt 2006), literature and of course in the policy side (Aurambout et al 2021; SHRINK SMART 2009 – 2012).

Following paragraph will give some insights about the notion of *shrinkage* and the different implication with the research: first (I) the phenomena will be seen a global prospective, secondly (ii) European specificity will be highlighted, (iii) third it will be unraveled the knot between *suburbanization, shrinkage* and *deindustrialization,* (iv) last, some insights about the application of the context in the Italian *intermediate* contexts will be presented.

Defined by Coppola (2012 p. v) in the apt image «of the daily subtraction of people, capital and human activity unfolded over several decades». Shrinking cities are an increasing international, 'end of era' phenomenon (Oswalt, 2006).

> Between 1950 and 2000, more than 350 large cities (over 100.000 inhabitants) lost a significant share of their inhabitants, among them 61 cities in the US. While international urban discourse focuses exclusively on the growing megalopolises and agglomerations, zones of shrinkage have been forming at the same time, and are generally ignored even so the share of shrinking cities is continiously growing.

First public debates around *shrinkage* derive from the Us context in relation with the 2008 financial crisis that highlighted «the vulnerability of current economic growth models and the failure of labor markets that once looked solid and stable» crisis but some similar issues gained importance in the aftermath of the Fall of the Berlin Wall in Germany context that caused dramatic depopulation and a strong deindustrialization process after 1989.

Looking at the *shrinkage* in light of globalizations in a global political geography perspective, urban shrinkage has been seen as specific spatial manifestation of globalization.

> Over recent decades, globalization has been concentrating resources, key infrastructure and intellectual assets in 'global cities', which act as magnets for population and skills (Sassen, 2001). The gradual shift towards a new global economic order (Castells, 2000; Harvey, 2000; Soja, 2000; Graham and Marvin 2001; Sassen, 2001; Dicken, 2003; Swyngedouw, 2004; Gereffi, 2005) has resulted in a new system of global production, manufacturing, distribution and consumption that has led to new urban forms made possible by the logistic and new technology revolution (Audirac, 2005). Simultaneously, other towns, cities and entire regions are experiencing the outflow of capital and human resources, and are suffering from a lack of entrepreneurship and low levels of innovation and intellectual engagement (Martinez-Fernandez and Wu, 2007). Cities whose development was based on a single industry, or on the concentration of an activity in a single sector, have been particularly affected by these globalization processes (Friedrichs,

1993; Bontje, 2004; Lang, 2005) and, as a result of increasing competition on
an ever-wider scale, certain cities are losing out (Cunningham-Sabot and Fol,
2007) (Martinez Fernandez et al 2012 p.213).

In the sense of the quotation reported, shrinkage processes characterize specifically that areas affected by the consequences of globalization in terms of concertation of power, skills and population in always more specialized *global cities.* In other words, the processes of globalization are powerful underlying causes of shrinkage in numerous *industrial* cities that have been unable to find a niche in the current competitive international economic environment (Martinez Fernandez et al., 2012; also Audirac et al., 2012).

In this sense, shrinkage process in inserted in a discourse about winners and losers of the contemporary urban process thus turn the notion of *shrinkage*, in line with other literary streams already mentioned in an ideological and political arena.

Referring to the *network society* and *regionalization* theories, shrinking cities have been defined as «places 'unplugged' from global networks». According to well-known Scott and Storper (2003) perspective, globally inequalities between regions and cities incorporated or not in the *global network* are growing. As a result, some areas lose their economic base, jobs and population, experiencing temporary or structural disconnection from the 'space of flows'. As a result of their marginalisation by global networks, shrinking cities are metaphorically 'unplugged' from the international engines of growth. This is the background raising the conceptualization of «Urban shrinkage as a spatial manifestation of globalization».

As well discussed in literature (Amin and Thrift 1994; Sassen 2001) in the process of globalization a small group of 'global cities' are evident where high-level financial, service activities, and information and communication networks are present. The presence of quality infrastructures, high levels of human resources, and dense networks lead to a more concentration of investments. Capital cities and large metropolitan regions can draw advantage from the concentration of political, economic and cultural institutions (Amin and Thrift 1994). Conversely, globalization is also the cause of the decline of numerous industrial cities that have been unable to find a niche in the international economic competition for capital.

In this sense, shrinking cities debate focused also on the territorial impoverishment of skills, shared knowledge and capacities because of migrations, ageing and low rate of young population and the concentration of innovators in the already mentioned cores. This is recorded at different scale and intensity both in the Us and in the European contexts. Consequences of these aspects are well known

in literature and in policy making and imply the balancing intervention of policies to contrast the *loop* of decline. Also in this case, these policies need to be not only business and macroeconomics related but a micro gaze is suggested interested in life style options united to a dynamic business environment.

Indeed, growth it is not only a macroeconomics matter, but it implies the self-representation of the place as well in which one lives, indeed cities that increase are perceived as 'successful, desirable and admired' and declining cities see themselves as living in places with a 'diminished sense of self-worth' (Leo and Anderson, 2006). These aspects are crucial in the research.

Shrinkage is somehow considerable the antithesis of growth, a value that occupies a central space in the American ideology embodied in such central themes of the national mythos as manifest destiny or westward expansion (Mallach 2017), this explains the deep difficulties associated with the idea of shrinkage in the American urban lexicon over the years. Indeed, the term *'shrinking city'* was widely seen as problematic outside scholarly circles, and a major element of the discourse was the ongoing search for acceptable terminology to refer to the class of shrinking cities.

In industrialized countries, globalization (Amin and Thrift 1994; Scott and Storper 2003) has been accompanied by deindustrialization and suburbanization. Today urban shrinkage, rather than being an exception or an aberration, could be analysed as a global and structural phenomenon (Oswalt, 2006). However, local actors tend to see urban decline as a sort of parenthesis, which should be as short-lived as possible with the firm belief that recovery is to be expected (Bontje, 2004). It is worthwhile revisiting this assumption, so as to envisage urban shrinkage as a durable, structural component of urban development.

Thus, while urban decline has been interpreted as being a stage in a cyclic process of boom and bust (Van den Berg et al., 1982; Booth, 1987; Friedrichs, 1993), it would seem more appropriate to hypothesize that 'shrinking cities' are the spatial manifestation of a global process accompanying the establishment of a 'new regime of accumulation' (Aglietta and Boyer, 1986). This process is of such magnitude that it reaches beyond (or encompasses) cyclic explanations of growth and decline, since the entire production system is being restructured, generating particularly marked spatial effects (Peck and Tickell, 1992).

Reckien and Martinez-Fernandez (2011) highlighted some shared common elements in what can be characterized as a 'shrinkage identity'. This can be defined as an urban area — a city, part of a city, an entire metropolitan area or a town that has experienced population loss, economic downturn, employment decline and social problems as symptoms of a structural crisis.

The term 'urban shrinkage' is used to stress the fact that this phenomenon is a multidimensional process with multidimensional effects and having economic, demographic, geographic, social and physical dimensions that not only continue to evolve as a result of new global and local realities, but also influence theories and research proffering diagnosis, prognosis and remedies. The term expands our understanding of 'decline' beyond the simple linear process that is generally understood to follow deindustrialization.

As mentioned, shrinkage conceptualizations have been shaped in the Us context and albeit a general framework in shared worldwide, nevertheless, the translation of the concept in Europe need some explanations because of the deep different nature of the urban in the two continents. Especially the conceptualization of shrinkage as a product of the global political competitive arena needs to be taken carefully when applied in the European case studies albeit there is recognizable as well of *new economical geography* of «few happy winning places and companies» according to transitions in technologies, values chain and labor market (Viesti 2019 p. 141).

In this sense, researchers highlight the important context sensitivity of the notion of shrinkage, as the multivariate nature of long-term processes and their causes cannot be explained only by globalisation (Haase et al 2016). If first part of the paragraph mostly focused on the process of *shrinkage* in the globalization process, European literature is interested more in the "indicators" and main elements that characterize shrinking cities.

According to recent studies, almost 42% of all large European cities are currently shrinking. In eastern Europe, shrinking cities have formed the overwhelming majority – here and three out of four cities report a decrease in population (Haase et al 2016).

Nevertheless, it is well known in literature, moreover, that population loss can't be considered the unique indicator – albeit crucial and the main- behind shrinkage process, rather it is a very diverse and complex phenomenon. The panorama of debates around urban shrinkage definitions is multifaceted: for a comprehensive overview, refer to Haase et al 2016.

Thus, urban shrinkage has been conceptualized (Haase 2016) as an *empirical phenomenon* resulting from the interplay of changing drivers of shrinkage at different spatial levels (from regional to global) that produces a decline in population at the local scale. These drivers of shrinkage may be related to economic decline, demographic change, and settlement system changes in the form of suburbanisation and urban sprawl (Couch et al., 2005; Kabisch et al., 2008; Nuissl and Rink, 2005). They may also include environmental disasters and radical changes in the political and administrative systems (e.g. through border changes due to warfare or the peaceful in-/exclusion of territories; Oswalt and Rieniets, 2006).

In some cases, deindustrialisation and job related outmigration, combined with a post transition decline in fertility, have played the major role; in others, economic decline and suburbanisation are the main triggers.
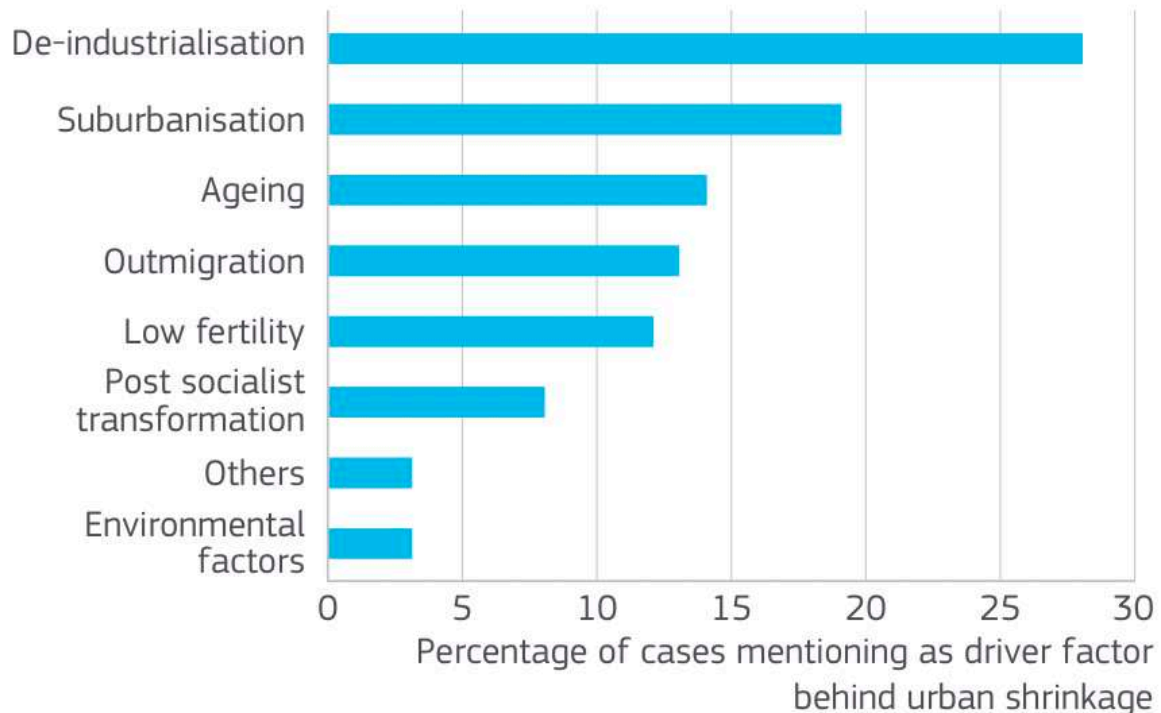
Graph 5: Reported causes of urban shrinkage. Source: Aurambout et al 2021

What is crucial to underline is that «shrinkage should not be universally attributed to a single macroexplanation» (Haase 2016). Indeed, it has been outlined *feedback loops* as relevant image to represent the shrinkage "circle" where economic decline could have a crucial role in a specific contextual population lose but several elements participate such as the consequences for urban development, which affect the local labour market, socio-spatial differentiation, housing, patterns of land use, the state of social and technical infrastructure, municipal finances, investment and the overall local economy.

Although shrinkage is often associated with economic decline, here it is argued that an economic downturn is a sufficient but by no means necessary cause of shrinkage and that a more differentiated understanding of shrinkage also needs to include demographic change and suburbanisation.

Suburbanization, deindustrialization and shrinkage are three terms that recur often in literature about shrinkage.

According to Audirac and colleagues (2012 p. 226): *Suburban shrinkage* is understood «as a degenerative urban process stemming from the demise of the Fordist mode of urbanism, is generally

manifested in a decline in population, industry and employment. It is also intimately linked to the global restructuring of industrial organization associated with the rise of the post-Fordist mode of urbanism and, more recently, the thrust of Asian industrialization». Another aspect not mentioned before put shrinking cities in direct relation with the deindustrialization associated with the demise of the Fordist mode of urbanism in the evolving post-Fordist metropolis.

Authors highlight the different patterns and consequences in shrinkage suburban – once production oriented contexts – that result for example in gentrification issues and displacement from the pressure to redevelop the most profitable sites; but also unemployment from deindustrialization with a dwindling public welfare safety net; declining support for public housing and provision of affordable housing; and relatively large populations of poor immigrants attracted by cheap or dilapidated housing.

Thus, the territories of the former industrial and working-class towns are gradually breaking up into quarters that are caught up in a process of growing pauperization, and quarters that are gaining value and gentrifying fast because of the economic and real-estate market pressures deriving from their proximity to the city centers. Urban policies have a critical impact on the evolution of inner suburban rings: in the context of globalization, these territories are probably more sensitive to change, and local policies may accentuate or mitigate the effects of real estate and private investment's pressure. As mentioned indeed, analysis of shrinkage in literature doesn't convey the attention only towards the population loss or the multiple explanations but also on the planning policies that follows *shrinkage recognition process* once assumed growing and decline as «simultaneous and interrelated urban process» (Martinez Fernandez et al 2012 p. 214).

How all these processes have been declined in the Italian context by literature?
In Italy, by contrast, urban shrinkage has never been a concept deeply used and discussed in long term tradition (Salone et al., 2015). Nevertheless, it has been introduced in the urban lexicon from the 80s focusing on «consequences of urban shrinkage, including physical dilapidation, uninhabited urban land and the influx of poor households and migrants into inner-city areas» (Calza Bini et al., 2010; Caselli, 1994). This last part of the chapter focuses specifically on the risks of shrinking in Italian midsize cities «subject to a medium-long term shrinkage» as reported by literature (Caselli 2020 p. 2020). Indeed, Caselli and colleagues (2020) research reveal that about 50 percent of the total medium-small Italian towns experienced a negative population change from 1991 to 2016. Disadvantaged areas are especially condensed in contexts with little appeal and less profitable economic activities, such as Southern Italy, the Insular hinterlands and the inner areas of the Centre-

North. In the same time frame, 42 percent of shrinking medium small Italian towns suffered a rapid contraction, 27 percent a slow contraction and the remaining 31% underwent stagnation.

Thus, in Italy small and mid-sized towns seem to be the most affected by shrinkage, according to the current defintions, also in the light of what was reported earlier on the role of Italian midsize cities in globalisation. Nevertheless, the overall attention to urban policies and spatial planning in these deprived contexts have been extremely weak on the national political agenda (Salone et al., 2015). More in general the Italian urban system seems to have adopted, since 2016, a general "shrinking dynamic". The change in the demographic structure because of specific demographic challenges such as ageing, the substantial economic and structural decline, the physical marginalization from public services and infrastructural axes and the loss of wealth have been freezing the development opportunities in about a half of the small and mid-sized Italian municipalities. However, the possible application of the urban shrinkage paradigm to the Italian case and urban network is controversial. Indeed, research highlight how shrinkage affects particularly the less industrialised cities of the south, and it is not as perceivable in the large and middle-sized cities of the north and center (Salone et al 2016), also in virtue of the crucial role of cities in Italian history that greatly advancing industrial development. On the other side, as following chapter will illustrate more in depth (4.1.1) the so called *trappola dello sviluppo intermedio* (intermediate development trap) is recognizable – beside in Southern Italy – also in deindustrialized contexts in in Northwest areas and in the Adriatic coast (Viesti 2021). These introductory aspects highlight how much room for more research in this field in the context of Italy is possible.

To summarize, all the mentioned labels have different semantic contents and bring different meanings to literature but taken all together are useful in highlighting the decisive interest that these issues has gained in the international scientific and public panorama (Vendemmia et al 2023).

It is now well recognized how relevant and unavoidable the territorial dimension is in the definition of marginality, fragility and inequalities. In Italy, also starting from the implementation and discussion around the SNAI strategy, a complex, multifactorial and multi-scaled approach to inequalities has progressively taken place. In other words, as pointed out, by taking into account territorial representations, when considering the production of inequalities, the north/south and centre/periphery dichotomies are no longer sufficient to describe the complexity and precariousness of social balances.

Among the dimensions concerning territorial fragility is explicitly the one of mobility. In this sense, research studying the transformation of mobility and 'accessibility in intermediate areas (and how they are mediated by infrastructural processes) means responding to a part of a more general picture with respect to the state and dynamics taking place in intermediate areas today.

This turns the issue related to infrastructure in political and social terms. The issue of mobility infrastructure is thus configured politically and socially, in terms of the social and territorial distribution of the possibilities of access to goods with risk of a de facto denying the full exercise of citizenship rights (Barbera, 2020).

The notions and concepts around territorial inequalities, however, encompass much of the theoretical elaboration of this paper. In conclusion here are underlined relevant aspects.

Territorial inequalities, first, can be reachable as well in terms of political representations and the possibilities of self-territorial representation in the public arena. Indeed, in the Italian case the reprentations of different territorial landscape pay the price for long-standing territorial inequalities. Moreover, the risks of polarization and hierarchization related to the presence of the infrastructure with supralocal interest, on the other side, nevertheless, territorial inequalities are readable in terms of *infrastructural capital*, that determine the ability to "stay in the game" and to emerge in a competitive scenario but also the allocation of essential services. The notion and the issue of accessibility is deeply related to and shaped by the one of *social exclusion* (Cass, Shove and Urry 2005)

In conclusion, last aspect regard *mobility justice* (Sheller 2018), as mentioned, indeed, it has been conceived as an *intersectional* concept that take at the same time different social, territorial and political degrees of exclusions that together build the different speeds and possibilities to move in space.

The empirical part of the research wants to take in consideration all these aspects. Following paragraph, lastly, highlight challenges of intermediate areas, in light of the fragilization issues, with accessibility, mobility possibilities and how these have been framed by literature.

3.6 ACCESSIBILITY and MOBILITY IN *INTERMEDIATE* AREAS

> Exploring the elements of what we have called car-dependent transport systems, and understanding their interconnections, exposes a deeply self-reinforcing system, apparently immune from economic and political pendulum swings, able to bend the forces that sway the rest of the society to its purpose. (Mattioli et al 2020 p. 14)

A specific literature on the relationship between mobility, accessibility and intermediate areas is only glimpsed since the notion of *intermediate* /in-between areas is not widely used as a territorial analytical prism. In fact, while the link between inner/rural areas and immobility has been extensively investigated (Farrington and Farrington 2005) also in the Italian context (Vitale Bovarone et al 2022; Lanza 2022; Vendemmia et al 2021), and on the other hand the synonymy between metropolitan areas and dynamism is the subject of debates and a long tradition of studies. If we want to systematize intermediate areas and mobility, a less obvious literature allows us to fit some pieces of the puzzle. Nevertheless, there are some recurring elements in the literature, following paragraphs will introduce these more in detail.

Some streams of literature are engaged in the relation between the broad notion of *low dense areas*, accessibility, mobility and *car dependence*; some other studies are focused on territorial densification strategies such as the TOD. Other literature focused on the mobility pattern in specific portions / scenarios of *intermediate* areas such as periurban, this is crucial since mobility flows and patterns are considered as a definitory indicator for the territorial classifications. Moreover, from mostly the Anglo-Saxon literature a lot of interest raised on *infrastructural corridors* and the *operational landscape*. Other research interests are recognizable in the analysis of modal share per demographic dimension: this explicitly allow to answer the question about the different ways of movement in midsize and small cities. Lasty, literature developed a strong interest in the effects of fast transport infrastructure on midsize and small cities and more on general towards regions outside the *cores* and on the planning of a well-integrated and equipped transport – especially if public and collective – in an areal, regional, national and international scale.

This paragraph will give a sight on these different streams of scientific interest in addressing the challenges of accessibility in intermediate areas.

Looking though the different geographical scale, following paragraph aim to give a portrait of the mentioned aspects first at the national scale, secondly in a regional and "di area vasta" perspective and lastly from an urban angle.

First, it is possible to recognize a quite wide literature on the relation between low dense areas, accessibility and mobility (Farrington and Farrington 2005). As Farrington and Farrington (2005) highlight the knot between territoriality and accessibility can be seen as «ontological» itself. Accessibility has been considered as a key aspect in defining rurality itself since «the differences between social groups are the key to interpreting the experiences of those living in rural areas», and that «nowhere is this more evident than with respect to accessibility» (Farrington and Farrington 2005 p. 2). The issues related to accessibility and mobility in intermediate areas have been highlighted clearly by the studies focused more specifically on the knot between sprawl – or urban diffusion in the Italian declination – and car dependence (Mattioli et al 2020) and the sustainability challenge in province. Accessibility, possibility of movement, sustainability, climate change, inequalities are at stake in addressing the complexity of car dependence as a crucial expression of the automobile system in which the contemporary society is (still) embedded. As Urry remind (2004 p. 26) the recent history of transportation has been characterized by «the predominant global form of 'quasi-private' mobility that subordinates other mobilities of walking, cycling, travelling by rail and so on, and reorganizes how people negotiate the opportunities for, and constraints upon, work, family life, childhood, leisure and pleasure». The notion of car dependency is used in the literature to indicate the extent to which the car is the only viable option for passenger travel in a given local area (Newman and Kenworthy 1999), becoming a 'necessary' commodity in low-density suburban and rural areas rather than in compact urban centres.

More specifically, indeed, low dense, provincial, intermediate, in – between areas are the ones where the car dependence of transportation system is *in plain sight,* most clear and evident. Low population and building density, low street connectivity and monofunctional land use are the most recognized characteristics and factors behind the greater usage of car in these contexts (Mattioli et al 2020). Car dependency is not only one of the elements that compose the sustainable challenge in intermediate areas but the main node of sustainable development and the mitigation of climate change. The knot between car dependence and intermediate areas is so strong to unravel also in virtue of its historicity. Indeed, as previously discussed, (CFR 2.2.2), historically, the increase in motorization has been highly intervened with deep changes in land patterns and the issues behind the greater levels of car use and car dependent travel behaviors need to be reached of course also in the territorial

configurations and specificities of land patterns (Erving and Cervero 2010). The dispersed city grows as the spread of the car increases and is modelled on it.
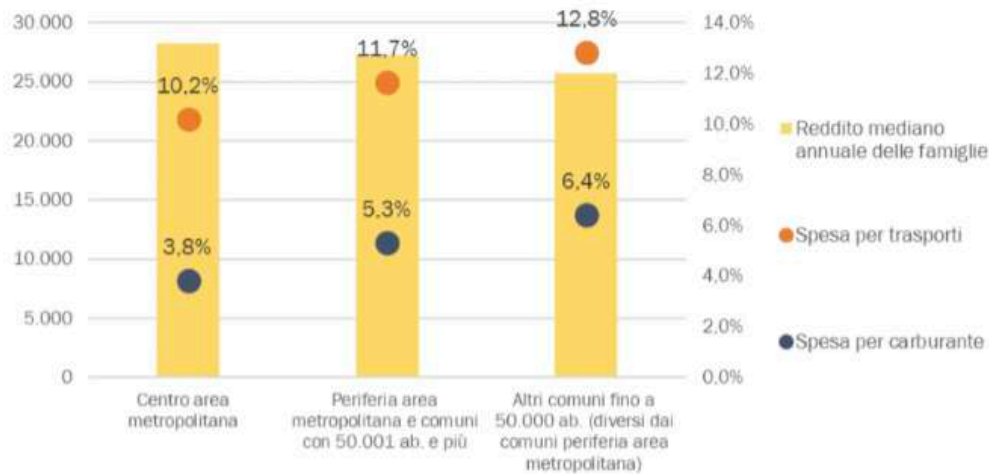
Graph 6: Share of household income devoted to transport and fuel expenditure by municipality of residence (Italy, 2022). Source: Gruppo Ferrovie dello Stato and Fondazione per lo Sviluppo sostenibile 2024 p. 14 on ISTAT data

Territorial issues and income are combined in this graph where it is visible how the percentage of transport and fuel expenditure grows as the demography of municipalities decreases, exceeding the median annual income of households living in municipalities of up to 50,000 inhabitants (Gruppo Ferrovie dello Stato and Fondazione per lo Sviluppo sostenibile 2024 p. 14[13]). This gives a clear idea of the relevance of the sustainable mobility discourse in 'intermediate areas' as it simultaneously takes the form of a social, territorial economic as well as transport discourse strictu sensu.

Territorial configuration and specificities of provincial land pattern is nevertheless not the only relevant factor in analyzing car dependency process.

Following Mattioli and colleagues (2020) political economy approach indeed it is possible to recognize and detail how car dependency is articulated into different and related factors that together cover a wide spectrum of aspects of contemporary society (table 8). What mention above can be referred to (i) the land use pattern "layer" that this paragraph deal together with (ii) the analysis of the public transport provision and (iii) the car culture aspects. Nevertheless, at least two other segments are crucial to fully understand the car dependent transport system we are in that are iv) the automotive industry and v) the provision of car infrastructure. All these fragments (i-v) barely are seen together as part of the same phenomena although each aspect is deeply linked to each other and together they reinforce a car-dependent transportation system (Mattioli et al 2020). Although this

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[13] https://www.fsitaliane.it/content/fsitaliane/it/sostenibilita/just-transition-e-trasporti.html Last visit 30/09/2024

work focuses more on aspects such as land pattern or public transportation provision or mobility cultures, all these aspects must be kept in mind as constantly co interacting underpinned factors.

First aspect to consider regard the multiple meanings of "Urban sprawl"[14] if related to car dependency. Indeed, it has been commonly framed as «unintentional outcome of market and policy distortion and deficient spatial planning» (Litman 2015), a *territorial bug* in the growing post war society due to the rapid reconfiguration of the city and the accelerated society of the mid-20th Century. Nevertheless, according to the political economy approach underlined (Mattioli et al 2020) how the knot urban sprawl and car dependent development have to be seen as a *feature* and *outcome* (led and encouraged) by specific political economic choices and strategies first in US suburbanization process and then in the *European* adaptation / version.

According to Mattioli and colleagues (2020 p. 14) sprawls and suburbanizations are not considerable only as a *bug, unintentional outcome of market and policy distortion and of deficient spatial planning or – moreover* - as a *casual outcome* of preference of rational self-interested individuals but, contextualizable in economic policies led by political actors (such as the State).   In this sense, once again, the sustainable mobility knot where mobility practices and territorial configuration come together need to be seen, especially in the «political feedback loop within the self-reinforcing dynamics of car dependent transport system» (Mattioli et al 2020 p. 8).

In other words, car ownership, car dependency and car dependent land use are thus configured in a vicious circle that (partially) allow to explore the long-debated relationship between low dense areas, car dependecy and accessibility.

This, as seen in the other paragraph (3.4.2) needs to be considered as an historical knot not only in the Anglo-Saxon context where this process is more recognizable but also in the European context albeit historical conformation of the urban and different regulatory path may have given different visible outcomes. European suburban contexts are usually considered differently regarding this debate, nevertheless, Phelps (2017) argues about the multiplicity and variety of *old* and *new* suburbanisms in the European countries, still «ongoing process with degree of complexity that makes it, against the historically specific background of European urbanization, an ideal subject of inquiry».

If moving on from a such pervasive automobile dependent system imply at the general – scientific, theoretical and practical – level an *alternative* system, defined post – *car system* (Pucci 2023), some

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[14] Here it is used "urban sprawl" instead of other labels to indicate what is commonly referred to in international literature, although the already discussed complexity and risks related especially in the European adaptation (for further insights about the use of *urban sprawl* in the European context Hesse and Siedentop 2018).

more specific and situated element (and challenges) of these alternatives and how have been addressed by literature are here presented.

Indeed, in this context in which the automobile system and the shape of the territory are mutually built and reinforced – at least in theory – the role and the power of shared, collective and public transport seems to be residual. The difficulties in organizing, implementing and financing a high quality regional public transport system in such contexts are well known in literature (Hansson et al 2021; Berg and Ihlström 2019 for the Swedish case). Indeed, less population and dispersed settlement and demand turn the financing and the planning of public transport challenging in *provinces* from a mere *cost – benefit/ offer - demand* perspective.

Summing up, in recent decades the relations between public transport and intermediate low dense areas followed a double dynamic. On the one hand the depowering of provincial services where they were present due to depopulation of nonurban centers for example in European and Italian former polycentric contexts, and on the other hand the non-implementation of public transport in more recently suburbanized areas. The movement for so much is twofold: on the one hand the cutting of unprofitable lines where they were present and on the other hand the non-implementation.

Public transport in low dense areas is fragile and fragmented due to economic issues and difficult planning, precisely because demand is lower and returns much less costs on the one hand, on the other hand, the dispersion of settlements also makes it difficult to concentrate transport demand. These are the two most popular arguments as justifications for the difficulty of provincial transportation. Mattioli and colleagues (2020) highlight some elements worth mentioning.

As mentioned in literature «density is not destiny» (Mees 2009) and car dependency is not the only vocation possible at least to think for intermediate areas. Based in a wide-open literature (such as McLead et al 2017, Buehler et al 2019; Badia et al 2017; Thompson and Matoff 2003) it is possible to argue that it is not only a matter of density, offer and demand but there are other political and economic elements often underestimated according to Mattioli and colleagues (2020).

The governing of public transport provision is settled in a spectrum between *free market provision* and *central planning*, albeit it is well known how public transport in low dense areas cannot be self-sustaining, but a great part is financed largely by public funds. Both mentioned models have different applications with different results in the low-density contexts, not all modes of public transport provision are equally suitable to the same network planning. Examples in literature are provided in both patterns. From one side negative effects related to the local public transport deregulation policies in Great Britain (Wolmar 199) are highlighted. These have led to the emergence of a few big players

who de facto act as monopolists in subsidized local areas and prevent new competitors from entering the market. Consequences have been seen in the decline of passenger number the fragmentation of services with following transport related social exclusions.

This model is juxtaposed with the german – spread mostly in Germany, Austria and Switzerland - cooperative model (Buehler et al 2019), the so-called "cooperative or network planning approach," which has had in the Verkerhrsverbunde (VVs) model an example of regionally based transportation planning and governance in which «businesses emphasize cooperation with their competitors as a means to greater success, as network effects benefit all participants in terms of greater patronage and revenue» (Mattioli et al 2020 p. 10; Koch and Newmark, 2016; Pucher and Kurth 1995) As a consequence of these models, an increase in PT usage and a decrease in car use has been seen.

Other analysis looks at the transport planning constrains of people living in *provinces* towards the use of public transport, where available. Main reported elements regard not so much the fact of having to change multiple means of transportation as for example the low frequency, lack of confidence, and complexity of learning new paths (Badia et al 2017).

To sum up, according to the selected literature the strategies to improve PT in low dense and intermediate areas to overcome the car – dependent transport system first move across the coordination strategy among the different actors and scale, involving for example the redistribution of resources from profitable routes and areas to unprofitable ones through cross-subsidies, public coordination and delivery of public goods for all.

Table 3

Reinforcing interconnections between the elements of car-dependent transport systems.

	1 Automotive Industry (cause)	2 Car Infrastructure (cause)	3 Land Use Patterns (cause)	4 (Undermining of) Public Transport (cause)	5 Car Culture (cause)
1 Automotive industry (effect)	–	Car infrastructure enables the sale of more cars, by providing space to accommodate them. The status of roads goes from shared public spaces to motorized flow spaces, literally driving other modes out, and enhancing the value of car ownership.	The need for cars to navigate urban sprawl creates an incentive for consumers to purchase more of them, thereby stabilizing demand for automobiles. Suburban, car-dependent constituencies further strengthen the car industry's lobbying efforts.	Historically, the legacy of monopolistic public transport companies has strengthened the political hand of the car industry. Currently, deteriorating public transport forces more people to buy cars.	Car culture produces a continuous demand for vehicles that upholds the car industry. It also influences the cultural dynamics of the industry itself, locking in certain approaches and business models.
2 Car Infrastructure (effect)	The automotive industry plays a key role in lobbying coalitions which pressure the government to invest public resources, and co-opt public space, to make room for cars.	–	The expansion of the suburbs demands high-capacity roads and highways to serve them, while also making it more challenging to travel by foot, bike, or public transport.	Public transport becomes dependent on car-dependent road infrastructure, bolstering the car industry's lobbying efforts.	Car infrastructure has durable cultural associations with progress, modernity, ruralism, and competent governance, which improve its political viability.
3 Land Use Patterns (effect)	The car industry, working with other aligned industries, such as suburban real-estate developers, actively promotes urban sprawl. Historically, car companies promoted visions of an efficient, modern cityscapes and suburban areas.	The expansion of car infrastructure encourages suburban and single-purpose development, which becomes more viable and more desirable due to mass automobility.	–	Lack of public transport options leads to locational indifference of sprawl, with no reason to prioritize land use around public transport axes.	Suburban land use has a potent set of cultural imaginaries (for example, white picket fences in the USA), which encourage more people to move to the suburbs and own cars.
4 (Undermining of) Public Transport (effect)	The car industry deliberately attempts to undermine public transport and is strengthened in its attempts to do so by the fact that the public costs it imposes are more hidden than those of public transport. During economic crises, public transport gets cut while the car industry gets bailed out. Meanwhile, the surplus capacity that the car industry builds into cars gives it a critical advantage over public transport in terms of range, marginal cost, and cargo capacity.	Infrastructure designed primarily for cars crowds out public transport road-based options such as buses and pulls financial resources away from other alternatives, such as railways or tramways.	Lower population densities make it more challenging to effectively organize public transport networks, leading to more car dependence and settlements outside public transport networks, in a vicious cycle.	–	Public transport is portrayed as unattractive, burdensome, and for the poor, young, or infirm.
5 Car Culture (effect)	The car industry actively supports the development of car culture, both deliberately, through advertising and marketing, and tacitly, through the built-in redundancy in the vehicles they sell, and the effects this has on people's daily practices.	Car infrastructure creates practices, habits and cultural trends (e.g. it is normalized as a symbol in children's toys).	Land use patterns, both for residential and work developments, normalize car transport, ensuring that alternatives are portrayed as marginal.	Poor public transport networks encourage more people to adopt car-centric lifestyles.	–

Table 11: Elements of car - dependent transport system. Source: Mattioli et al 2020

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3.6.1 The economic and environmental costs of the intermediate areas: perspectives and sustainable strategies in the moving of intermediate areas

Literature has long thematized how strongly the transport sector is involved in climate change (Mattioli et al 2020) and this is combined with the economic and environmental effects of suburbanisation and urban sprawl in national and international contexts.

Among the explicitly environmental factors related to land consumption, hydrogeological hazards, environmental degradation, pollution derived by the growth of emissions from transport and congestion are relevant element in the *current age unsustainability*. Latter elements are clearly relevant for the research and linked to a car-dependent context (Mattioli et al 2020) such as that of intermediate areas.

Therefore, a highly fragmented context dependent on the use of the car poses thus a twofold series of problems in terms of sustainability: socially, it relates to those who, for age or economic reasons, cannot afford a car, considered also the change in the social morphology of *intermediate areas* related to the potential depreciation of these in the light of the «return to the core city» . The second order of problems opens the issues of ecological transition and decarbonisation.

The extensive use of the soil, the strong manufacturing connotation (65% of the workers in this sector live in intermediate areas (Lanzani *et al* 2020), and the dependence on the automotive system are factors that have led to environmental discomfort enough be put in relation to the dynamics of potential decline that affect these areas (ibidem). Authors refer also to an infrastructural system that in the last decade progressively broke its relationship with nature and the number of adverse events rose, opening up the need to a gaze at these territories not from the point of view of urban development and growth but of environmental recomposition in order to make the territory safe (Lanzani et al, 2021).

The nexus between urbanization, land-use and mobility infrastructures, as highlighted above, is dense and complex, calling into question multiple possible ways of addressing the nexus theoretically and practically.

Sustainability strategies such as those for reducing the impact of the car in intermediate and low-density areas are therefore complex and diverse and pass through elements, practices, and references now widely popular in the literature, which will be explored in depth in the following paragraph.

These challenges has been considered also within the toolbox of the post-car city (Pucci 2022; Cathcart - Keays 2015; Bausells 2016; Jones 2018; Bertolini 2020; Banister 2008; Dennis and Urry 2009), a model «that does not envisage the elimination of cars but favors their more rational, shared and fully integrated use with other modes of transport, to be used only for certain types of travel and in areas not effectively served by other modes of transport» (Coppola et al 2022 p. 20).

Post car city tools and approaches can be located at different scale: combining a supra local and regional gaze with a more urban set of policies. Indeed, many experiences are spread in many European cities especially after pandemic where several *street experiment*[15] of proximity and *urban tactics* (Lydon and Garcia 2015) have been implemented with the aim of reduce the impact and the presence of car, flourishing the new wave of chrono - urbanism studies (Moreno 2021) (cfr. 2.7).

The multiple level and meanings of proximity become thus a crucial way of thinking post – car city contemporary at different scales and distances. As mentioned, «proximity become thus the tool for re – writing metrics through which essential services are guarantee both in dense urban and dispersed contexts» (Pucci 2021 p. 15). The theoretical and practical toolkit of the post car city takes into account different approaches and tools precisely because of the settlement complexity particularly visible in a context such as Italy.

In this debate, the conversion of the heat-engine cars towards the electric vehicles gained crucial importance in the car and sustainability debate as a one of the prominent action and strategy of the sustainable transition all over the word. Albeit the debate is big, here only some elements are considered in relation to the possibility of movement in intermediate areas. In a nutshell, a big stream of literature argues in favor of the electric transition of car system especially in this context due to the difficulties and accessibility challenges of moving in intermediate areas. This can be encouraged as well by policies incentives differentiated according to the territorial location. Specifically, regarding the sustainable mobility policies for territorial fragmentation and diffuse cities Pucci, Lanza and Del Fabbro (2021) discuss the necessity to «define a framework of criteria for addressing incentive policies for the so-called E- mobility according to the territorial and socio-economic characteristics of the areas» (ibid., p. 328), differentiating the subsidies on the basis of population density, economic conditions, environmental characteristics, mobility dynamics and infrastructural equipment. Supporting the allocation of bonuses for electric mobility on an explicitly territorial basis and supporting those who live in areas poorly served by local public transport services. The authors also point out that the distribution of these bonuses regardless territorial dynamics would lead to socio-territorial imbalances and paradoxically to fuel old problems such as urban mobility congestion,

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[15] https://streetexperiments.com/

improper use of public spaces, and in terms of competition with LPT, which would disadvantage once more the most vulnerable users. Territories that grown in that urban sprawl and rur-urbanisation period, as well as the inner areas themselves, would therefore be the most suitable spaces in which to integrate innovative policies for the mobility of the future, territorial cohesion policies and sustainability.

Another crucial body of literature that address sustainability strategies and policies in the context of intermediate areas is focused on Transit Oriented Development (TOD) (Ewing and Cervero 2010; Hrelja et al 2022; Staricco 2018 Hrelja and Rye 2023).

TOD is typically defined as an integrated approach to transport and land use planning that makes walking, cycling, and transit use convenient and desirable, and that maximizes the efficiency of existing public transport services by focusing development around or close to public transport nodes (Thomas & Bertolini, 2015). Scholars who refer to the TOD approach (Hrelja et al 2020 for a review of the literature Bertolini et al 2012; Thomas et al 2018; Pucci and Vecchio 2019) have long thematised the potential of the nexus between housing density, services and collective infrastructures. Usually TOD concept is based, investigated and implemented in large, core and dense context and less in small and midsize contexts also in virtue of the challenges related to actor relations, financing, market conditions, planning, competences and interest at stakes.

Nevertheless, potentiality of research and application in the intermediate contexts are well known in literature (Hrelja et al 2020). With reference to TOD in areas of differing development densities, Nigro and colleagues (2019, p. 111) write that «very few studies on land use and public transport integration focus explicitly on geographical areas characterized by medium or low densities of population and activities». TOD as a design concept cannot be easily applied in the same way in all contexts. For its implementation to be successful, each TOD project needs to be adapted to its specific urban form, political and planning context (Thomas et al., 2018).

Modal share data in Midsize cities in Italy

Another aspect investigated in literature (Isfort 2022) regarding the way of moving in intermediate areas focus explicitly on the modal shares by population size of cities.
Although this approach does not give a full picture since doesn't give an account on the contexts in which municipalities are embedded (i.e. if they are municipalities on a built continuum or are remote

and isolated, whether they are functionally independent, or whether they are mountain, plain or coastal municipalities) these analysis help us in addressing some considerations.

These don't answer completely about the questions around *intermediate areas* but since the importance of midsize cities in the scenario it supports having a portrait about how people move outside main cities and rural areas in Italy.

A first glance at mobility in medium-sized cities in Italy might lead to think that they are the ideal context for sustainable mobility, that they are potentially walkable and bikeable contexts due to the compact and concentrated character of medium-sized cities built and settled around highly visible centres and services. The data, on the contrary, shows how car use grows as demographic thresholds increase, and specifically car use is much more widespread in cities between 50 and 250 thousand inhabitants than in those over the 250 thousand threshold (ISFORT 2020).

This can be primarily attributed to two reasons. The first: the medium-sized city 'is no longer the compact city it once was' but can be configured in a spatially dispersed pattern of its own and some kind of suburbanization.

The second order of reasons lies in the fact that the LPT system in medium-sized municipalities, as partially addressed before is more fragile. The combination of these two factors coupled with a persistent car-related culture and imagery, reproduction of mobility practices and behaviors means that public transport planning in so-called low-density areas, intermediate areas and medium-sized cities can be challenging, and even more so when viewed from a multi-scalar perspective, necessarily considering the relationship with major metropolitan centres.

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2021				
Oltre 250.000 ab.	29,8	3,4	5,1	49,6	12,2
Tra 50.001 e 250.000 ab.	24,5	5,6	3,8	61,1	5,1
Tra 10.001 e 50.000 ab.	20,3	3,7	2,1	69,2	4,7
Non più di 10.000 ab.	14,7	3,5	2,7	74,1	5,1

■ Piedi ■ Bicicletta ■ Moto ■ Auto ■ Mezzi pubblici

2020				
Oltre 250.000 ab.	39,0	2,8	4,4	42,1	11,6
Tra 50.001 e 250.000 ab.	28,0	5,0	2,8	60,4	3,8
Tra 10.001 e 50.000 ab.	25,7	3,9	2,0	65,2	3,2
Non più di 10.000 ab.	21,9	3,4	1,7	70,1	3,0

■ Piedi ■ Bicicletta ■ Moto ■ Auto ■ Mezzi pubblici

2019				
Oltre 250.000 ab.	25,6	3,1	4,6	47,7	19,1
Tra 50.001 e 250.000 ab.	20,2	4,0	2,2	63,7	9,8
Tra 10.001 e 50.000 ab.	20,2	3,9	2,0	67,6	6,3
Non più di 10.000 ab.	15,7	2,2	1,2	74,9	6,1

■ Piedi ■ Bicicletta ■ Moto ■ Auto ■ Mezzi pubblici
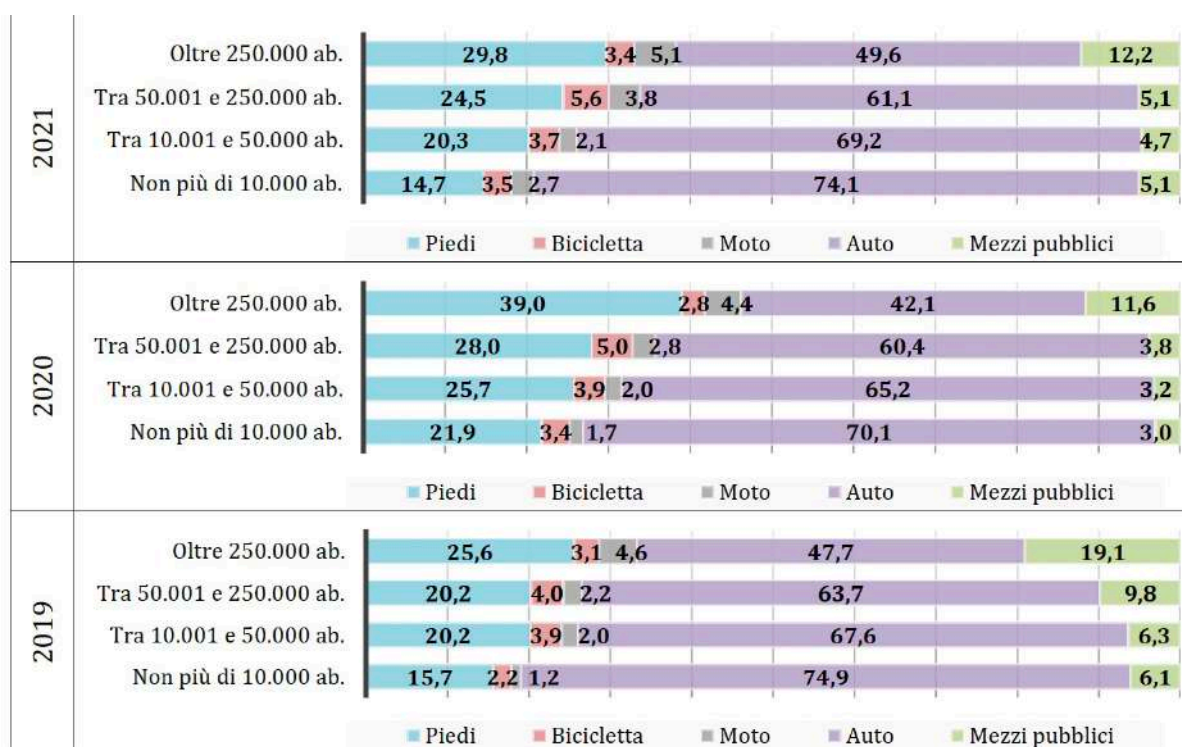
Table 12: % distribution of trips by mode of transport used and population size of municipalities of residence. Source: ISFORT,
Osservatorio Audimob sulla mobilità degli italiani (2022)

Looking at the table, in addition to the elements already considered, some relevant aspects to emphasise are the following. Regarding pedestrian mobility, this is mainly developed in large cities with more than 250,000 inhabitants, where it will reach 30% of trips in 2021, almost twice as much as in small municipalities (with less than 10,000 inhabitants).

Similarly, public transport is also well developed in large cities, where the modal share reaches 12.2%, more than twice than in all other municipalities; although there has been a decrease in the modal share of public transport since Covid, the weight of collective mobility in large urban areas was very close to 20%.

Cycling characterizes above all the modal profile of medium-sized towns (50-250,000 inhabitants); here the share reaches 5.6% in 2021, up from 4% in 2019, while it is less widespread in both large and small municipalities.

Lastly, **car** is close to a modal share of 75% in the smallest municipalities, while it reduces its predominant weight in correlation with the increase in the size of cities to the extent that in large urban areas it is (slightly) below 50%, a value that is nevertheless significantly higher than both 2020 (42.1%) and, to a lesser extent, 2019 (47.7%).

In short, the 2021 data presented by ISFORT report confirm the very significant gaps in sustainable mobility between the smaller centres, dominated by car use, and the large cities where both pedestrian and especially collective mobility are much more developed.

The size of the metropolitan city affects moreover the modal split profile (Table 13). In metropolitan areas, more people use public transport (in 2021, double the share compared to the rest of the national territory) and walk more (25.3% vs. 20.8%), while the use of cars (almost 9 points less modal share) and bicycles (3.1% vs. 4.9%) is more contained.
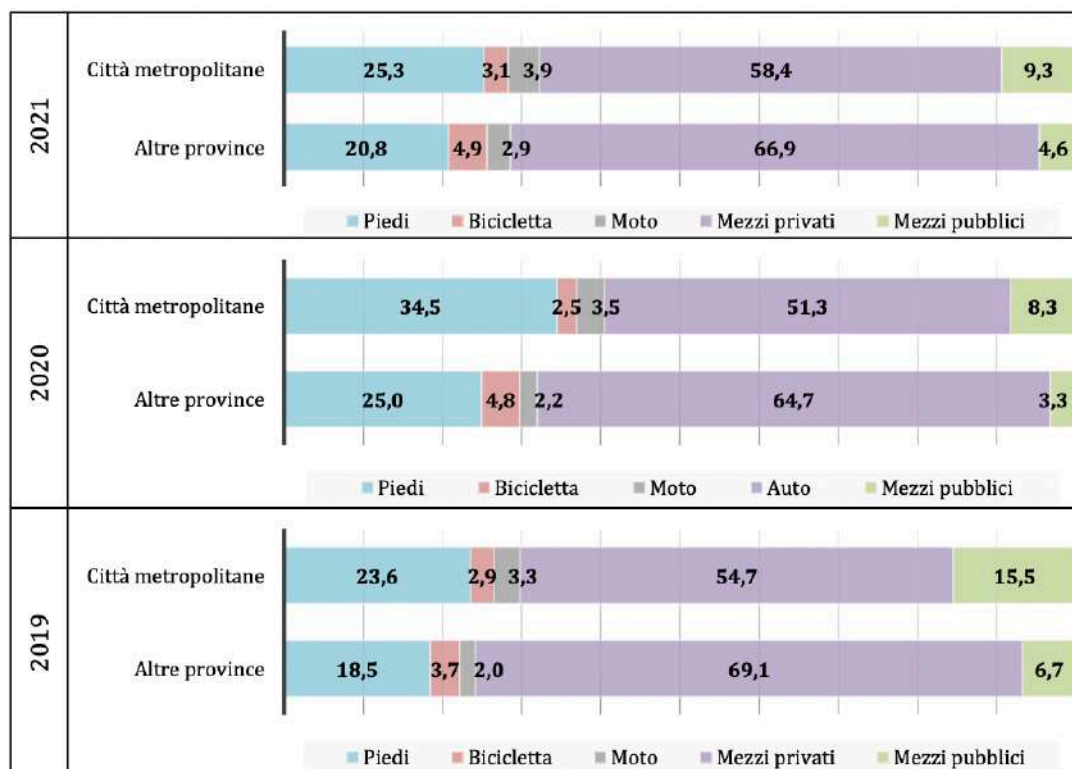
Table 13: % distribution of trips by mode of transport used and municipalities whether or not they belong to a metropolitan city. Source: ISFORT, Osservatorio Audimob sulla mobilità degli italiani (2022

Lastly, the following graph (tab. 9) shows the distribution of municipalities on the basis of urban gravitation, taking up the criteria proposed by the SNAI (National Strategy for Inner Areas). It is here underlined that in the Peripheral and Ultraperipheral Municipalities the mobility pattern of citizens is strongly marked by the priority use of the car (modal share over 70%), while the weight of both the bicycle (3%) and public transport (4%) is entirely residual. In the 'Belt' or 'Intermediate' municipalities as well, despite their greater proximity to the urban poles, the use of public transport is marginal, as the components of active mobility, especially pedestrian mobility, they are significantly lower than in the Pole municipalities. As the report also suggests «the knot of territorial

fractures in the demand for sustainable mobility is thus re-proposed, a knot that is not always at the center of public debate and that clearly derives from imbalances in the policies of supply in infrastructures and, perhaps even more so, in services. The arrangements of the citizens mobility model that are being defined in the post-pandemic period not only do not recompose these fractures, but rather seem to accentuate them» (ISFORT 2022)
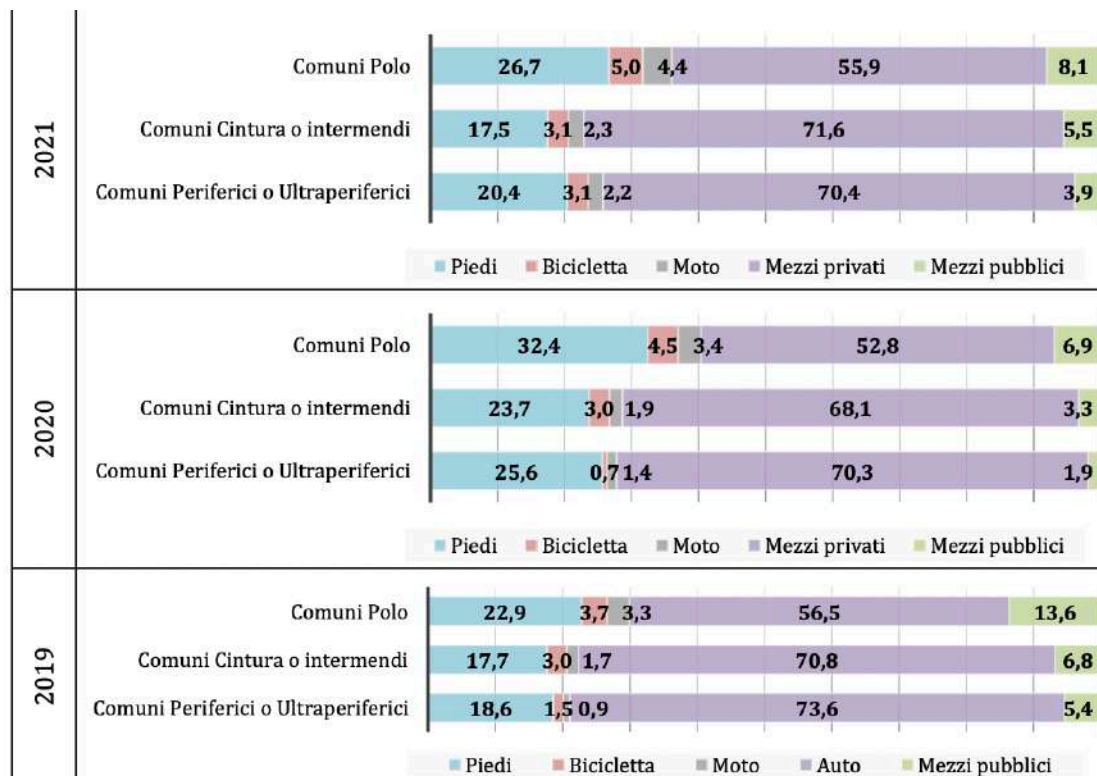
Table 14: % distribution of trips by mode of transport used and municipalities according to SNAI classification Source: ISFORT, Osservatorio Audimob sulla mobilità degli italiani (2022)

Still on the topic of modal share analysis by gravitation model, it is interesting to cite the extensive literature describing mobility patterns in the peri-urban. The peri-urban itself is defined by intense mobility dynamics (Piorr et al 2011; Colleoni Caiello 2013; Brian et al 2020). Peri-urban areas are characterised by higher car ownership and use, in line with what has been reported with respect to the weakness of LPT and poor pedestrian accessibility. In fact, peri-urban areas are characterised by a low threshold of urbanity (Colleoni and Caiello 2013) in which low levels of walkability are defined by an accessibility to neighbourhood services characterised by dispersion factors and driven by car use. Specifically, an analysis focusing on the peri-urban areas of Milan, Turin and Bologna in 2012 showed that 76% of the inhabitants of the peri-urban areas would prefer to use the private car for their travels compared to a national average of 65% (Castrignanò, Colleoni and Pronello 2012). In addition, they spend more time travelling to places of study, work and other daily activities, whereas the high

number of journeys is normally described as the result of the difficulty of combining the performance of activities that are, evidently, more dispersed over the territory in a single trip (MIMS 2021).

A final element to answer the questions respect the possibilities of movement in intermediate areas in Italy provided by the literature can be found in the studies dealing with the territorial effects of high-speed railways both as a factor of territorial polarisation and the creation of territorial networks. However, in view of its relevance in the present work this topic will be explored in chapter 6 (6.3)

Figure 9: What does success looks like? Source: Infuze project https://in-fuze.org.uk/

3.7 Summary of the chapter

Chapter 3 focuses on territorial dynamics and transformations, particularly emphasizing intermediate areas, infrastructure, and mobility processes. The chapter opens by framing the dynamics of territorial transformation through processes such as infrastructural development and mobility. It lays out the preliminary theoretical elements around the concept of territory and its multiple meanings, discussing why "territory" is chosen over terms. The review of conceptualizations of territory provides a starting framework for the research. In understanding territorial transformation consequences (3.2) two approaches are prevalent in the literature: first resulting in territorial hierarchization, often due to infrastructural developments, secondly how the reticular model challenges hierarchical approaches by emphasizing systemic integration and complementarity among territories.

Chapter 3.3 discusses territorial transformations within the Italian context, presenting several geographies, morphologies, and taxonomies reviewed to frame Italy's territorial complexity. The portrait of Italian territorial diversity led to the relevance of intermediate areas that are presented from the conceptual (3.4), historical (box 7) and dynamic (3.5) angle. In synthesis, intermediate areas perspective, beyond the conventional urban-rural dichotomies, are crucial for understanding Italy's urbanization processes and claim for more research. 3.5.1 indeed, highlights main challenges, reviewing relevant concepts related to territorial marginalization processes. Looking at marginalization as a multidimensional concept it is seen how this crucially cross mobility and accessibility dimensions that place interesting challenges that paragraph 3.6 highlights. This last paragraph specifically try to frame the knot between mobility, accessibility and intermediate areas and its challenges taking several puzzle pieces from different streams of literature such as car dependency, local public transport fragility, TOD planning strategies, the modal share data of midsize. These bodies of literature allow to have a clearer picture of the dynamics, characteristics and challenges of mobility and accessibility in intermediate areas.

PART 2 – METHODOLOGIES, TOOLS

AND EMPIRICAL RESEARCH

CHAPTER 4 – METHODOLOGY AND TOOLS

4.1 SPACES: THE MACRO AREA CONTEXT
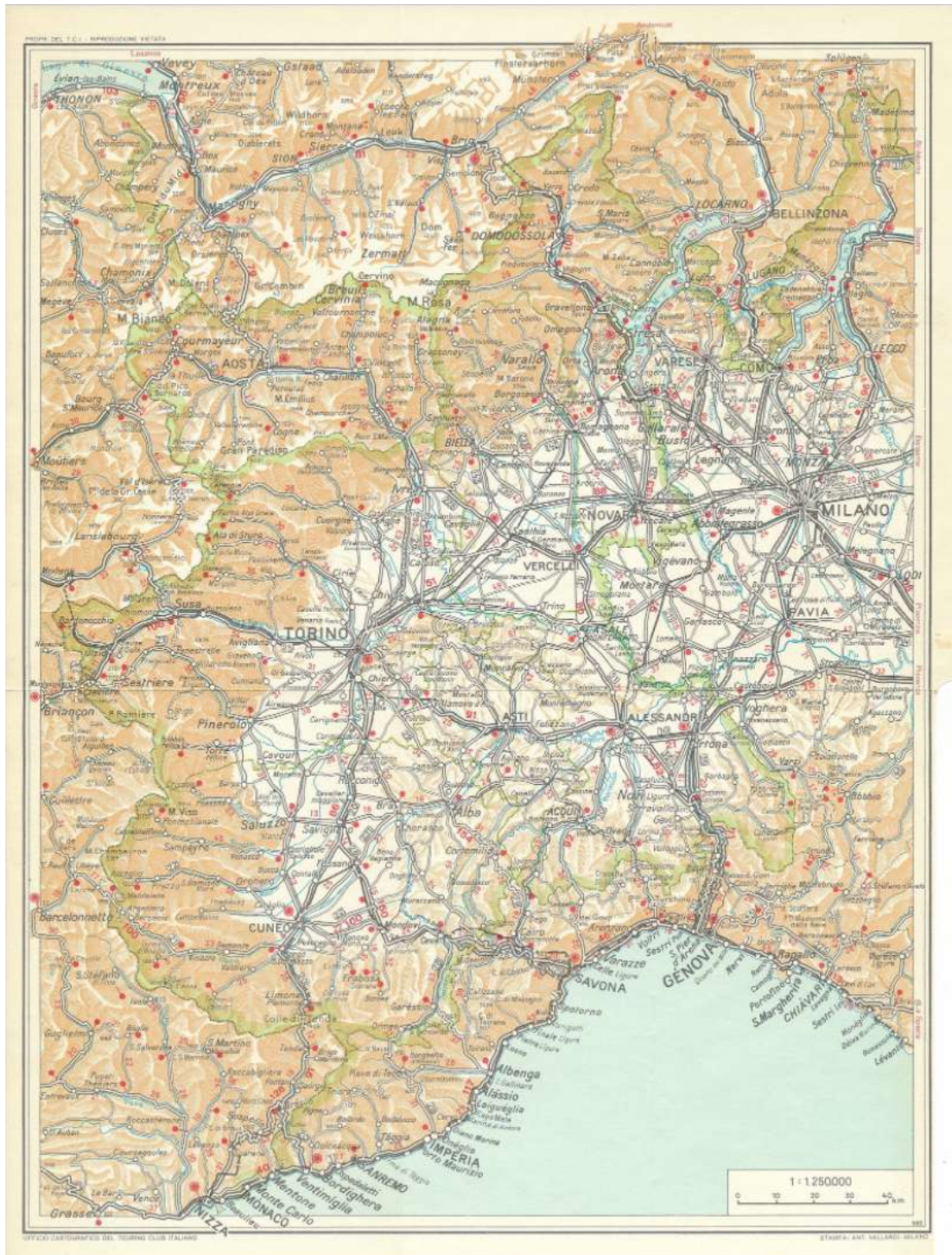
Map 14: North West Italy

4.1.1 Historical role in the Italian territorial system

The crucial role of Northwest Italy macro area in the Italian (and European) scenario is well known and has a long-term tradition of studies (Castronovo 1995; Berta 2008; Muscarà et al, 2013; Rocca 2015). This area has been historically the core of the first (late '800) and second (after II World War) Italian industrial development – the so called "industrial triangle" - and it is still publicly claimed as it although the situation changed a lot, enough to turn the scenario into something hard to recognize (Bigatti 2023).

North West Italy was characterized by three main urban poles of development, defined as "capitals of the economic miracle" that demographically largely increased during the Sixties becoming the destination of important flows of internal migrations that marked the urban development (i.e. Levi and Maida 2002 for Turin case). Clearly, the poles had a crucial role in the processes, the discourses, the politics and the economies of the whole triangle.

Nowadays, only one of the poles, Milan, remain in the international arena as "more" global actor, attracting capitals and investments. Genoa, as largely emphasized in literature (Pichierri 1989), began its decline in the 1970s, earlier than the other poles, when that the so-called state-driven capitalism (Italsider, Ansaldo, San Giorgio) came to an end. At the same time the city of Turin, the so called "company town" (Bagnasco 1990) intertwines its decline slowly with the Fiat crisis, going through a long rethink 'after' the factory and repositioning itself in the international arena as a cultural and university city (polytechnic) and of the events (pyrotechnic) (Belligni et al 2009 Belligni and Ravazzi 2013).

Through different paths in the three capitals of the triangle, thus, 'the search' for a renewed urban centrality, since the 1980s, takes place and mobilizes different urban elite groups with different action and perception capacities. In this sense, the response to the first winds of decline that affected the North-west in its complexity relied almost exclusively "on the propulsive role of the metropolitan hearts, through a more or less explicit tertiary re-centralisation of planning despite the emergence of new geographies of development inside and outside the city, which witnessed a difficulty in the political reading of the crisis able to focus on the interdependencies between the various territorial components of development[16] (Bolocan in Bigatti 2023 p. 263).

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[16] (Islands of progress in a sea of decadence - Campos Venuti 1984)

During the Sixties, territorial hierarchies were clearly defined: Northwest Italy, with a strong agricultural base, was the economic region more advanced also under the industrial profile. Moreover, strong manufacturing traditions rooted in time, such as those of the Biella and upper Milanese textile districts, a network of medium-large urban centers with a markedly industrial character, from Ivrea to Bergamo and Brescia, and finally three development poles bridging the vertices of an ideal triangle substantiated its economic profile (Bigatti 2023).

Nowadays territorial scenario and relations changed a lot and several territorial vocations (productive, agricultural, touristic, cultural…) converge, nevertheless the historical productive connotation has shaped the entire scenario. As some scholars argue (Trigilia, 2014) the presence of big players modified somehow the "homogeneity of the medium- sized cities, concentrating the territorial production in specific sector and the relative supply chain. In a context of crisis (of that sector) this could become highly risky for territorial resistance. Postfordism transition thus became an important insight to be considered not only for the poles of the triangle but for the whole territorial complexity.

4.1.2 Economic transition of intermediate areas of *industrial triangle*

Within this scenario, interest emerges in addressing what will be defined by this work as the 'intermediate areas' of the Northwest, in the discursive, material and narrative orbit of the so-called industrial triangle. The functions, conceptualization, territorial and urbanization dynamics of the so-called intermediate areas are indeed subject to profound transformations, of which the aforementioned processes of deindustrialization constitute the most widespread and discussed but not exclusive public narrative reference.

Some literature (Viesti 2021; Curci et al 2020) speaks about potential processes of territorial fragilization (Coppola 2021) and marginalization of intermediate areas – both highlighted in terms of indicators and discursive - specifically in this geographical context.

As highlighted in literature (Viesti 2022), North West Italy, indeed, would correspond to the so called "regions of early industrialization", in line with similar areas in the Europena and International context such as North East France, South Belgium, protagonists of the first European industrialization in the XIX century. These regions would have remained caught in the so called "intermediate development trap" (trappola dello sviluppo intermedio): more expensive than the new places of

production but less innovative than the currently more competitive regions, fraying the texture of the mutated European industry and redefining the regional boundaries of its manufacturing core of 'strong' production (Viesti 2022).

Focusing closer to what I mean with the "inside of the industrial triangle" can be roughly represented by the axes along the actual provinces of Asti, Alessandria, Vercelli, partially Pavia and Cuneo provinces, leaving aside the metropolitan cities of Milan, Genoa and Turin.

Once delineated Northwest Italy as relevant zone for the research, inside the so called "industrial triangle", the selection of a more specific area for the research, in first instance, took in consideration the following criteria: a) territorial continuity, b) demographic thresholds and trends, c) local importance; d) relevance in railway system considered.
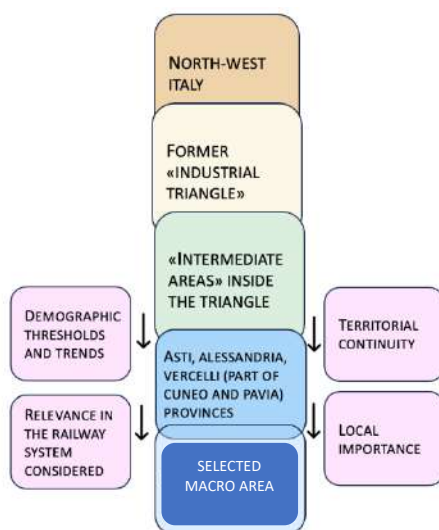
Figure 10: Selection process of the research macro area. Authors elaboration

As will be more deeply argued further in the work, concerning point b, a first sight to demographic data leads the research 1) to exclude the metropolitan cities of Turin, Genoa and Milan. Moreover, the functional area of Milan has been left aside, with for example the province of Novara although geographical inside the industrial triangle. Nevertheless, the boundaries of metropolitan and functional areas are phenomena of crucial interest for what concerns the research interests.

This doesn't mean that inside the functional area of Milan or inside the metropolitan cities there aren't "intermediate areas" but these are not part of the selection of the case study. Further research will be interested in studying and analyzing the concept of "intermediate areas" inside the metropolitan functional areas and metropolitan cities.

Thinking about framing the case study, it has been important to consider the classification suggested by Istat of Local Labor Market (LLMs) (Sistemi Locali del Lavoro) (Istat, 2015) that allow at a first glance to visualize dynamics of *attractiveness* of territorial poles, independently from demographic weight and from the administrative. LLMs are subregional clusters of municipalities that allow to read socio – economic phenomena at a lower scale than provincial one (NUTS3). They are defined from, first of all, the analysis of commuting patterns (based on population census), territorial continuity and cohesion, self-containment indexes and employment dynamics, allowing to frame the everyday routines and behaviors of people habits, in residential and movement perspective.

Looking at the choice of the LLMs cores made possible to reach a criterion that considered a finer texture than the provincial level, responding to a principle of capillarity and territorial polycentrism, stressing the local relevance of towns.

Lastly has been considered the relevance of the pole within railway system here considered, this lead to exclude both ones not touched by lines and not provided with a reference station, on the other hand this leave aside the northernmost part of the provinces of Novara and Vercelli.

Following map (Map 15) highlight this area from the perspective of LLMs, among several descriptor of territorial organization.
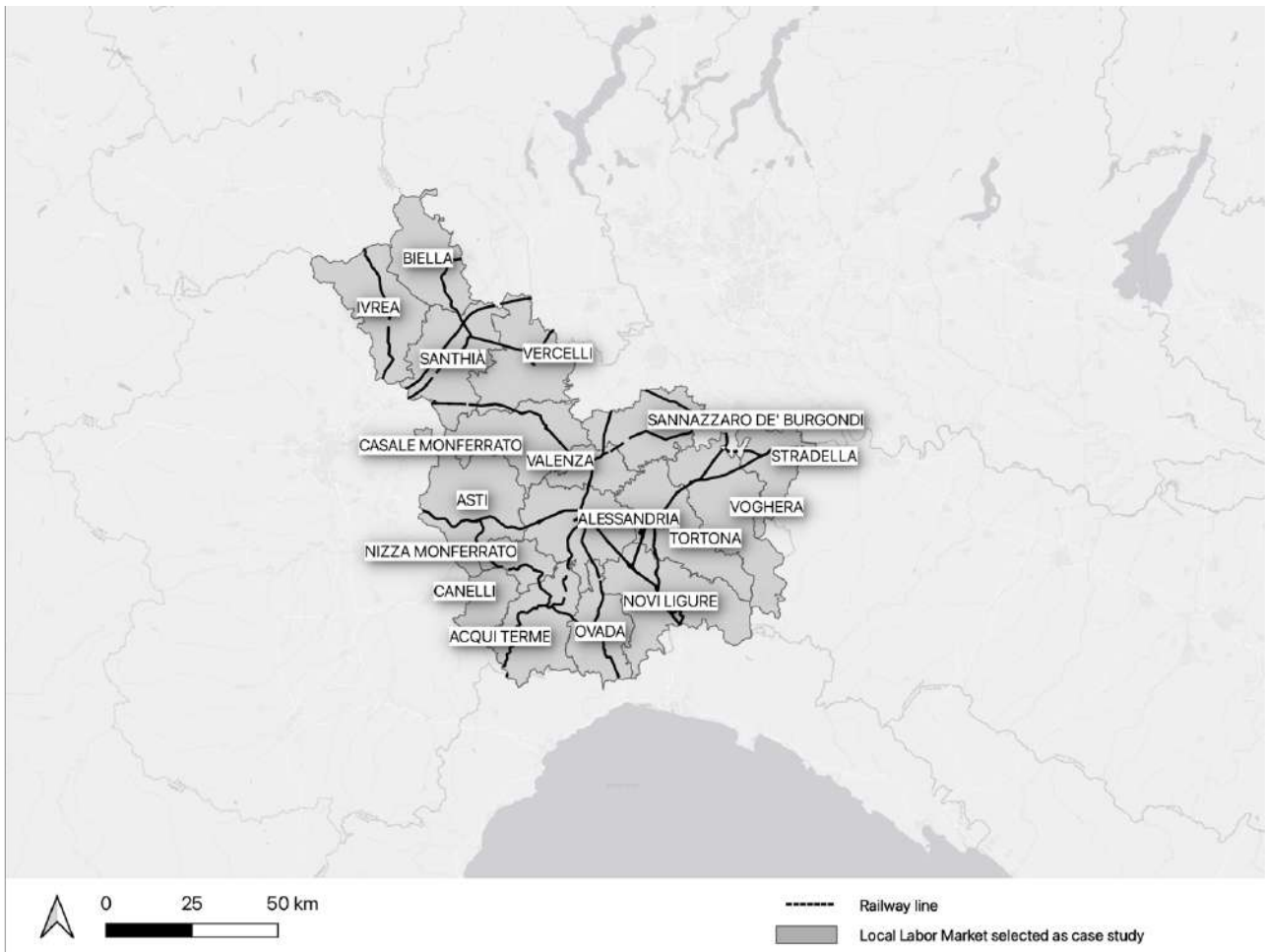
Map 15: Intermediate Northwest Italy. LLM visualization. Authors elaboration on ISTAT and OSM data

Similar to the functioning of Local Employment Systems, AITs were also used in the Piedmont region (Dematteis, 2016). The Ambiti di integrazione territoriale (AIT), elaborated from the research 'I sistemi locali nello sviluppo territoriale' (Local systems in territorial development) drawn up between 2000 and 2002 (Governa and Dematteis 2005) and then adopted by the Piano territoriale regionale (PTR) of Piedmont (2011) as unit of analysis of the territory focused on local development. In fact, in addition to the provinces, Piedmont's territory is subdivided into quadrants (quadranti)(N-E, S-O, S-E and metropolitan), within which the AITs - Ambiti di integrazione territoriale (Areas of Territorial Integration), 33 aggregates of municipalities at the sub-provincial level, are delimited. In agreement with the provinces, the AITs are defined on the basis of two criteria: 1) the common gravitation on a main urban centre that not only attracts commuters for work, but also has service and territorial organisation functions in the local area, 2) the self-containment of flows and socio-economic and institutional relations within this gravitational sphere.

The organisation of the territory by AIT is aimed in expanding the possibilities of local and territorial protagonism in terms of knowledge and governance rooted in the already existing social and territorial ties and strengthen where are lacking. This approach also makes it possible to the "territorial added value" of projects assess in itinere and to define plans and policies on a regional scale made up of the networking of local territorial systems.

Both territorial units will be analysed in more detail later in the research.
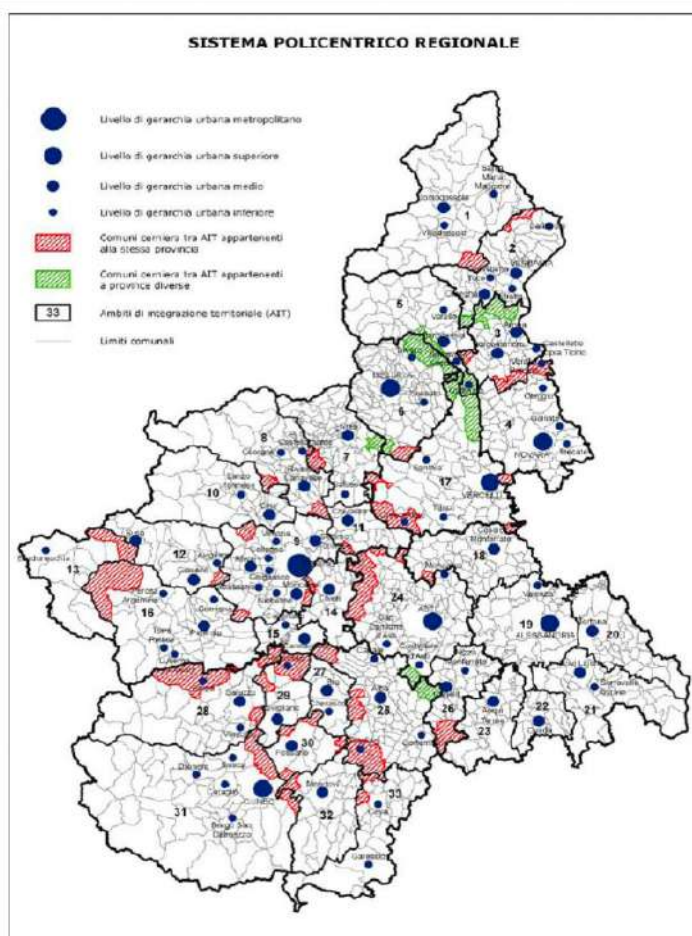
Map 16: The 33 Areas of Territorial Integration (AIT) of Piedmont. Source: De Matteis 2016 p. 3
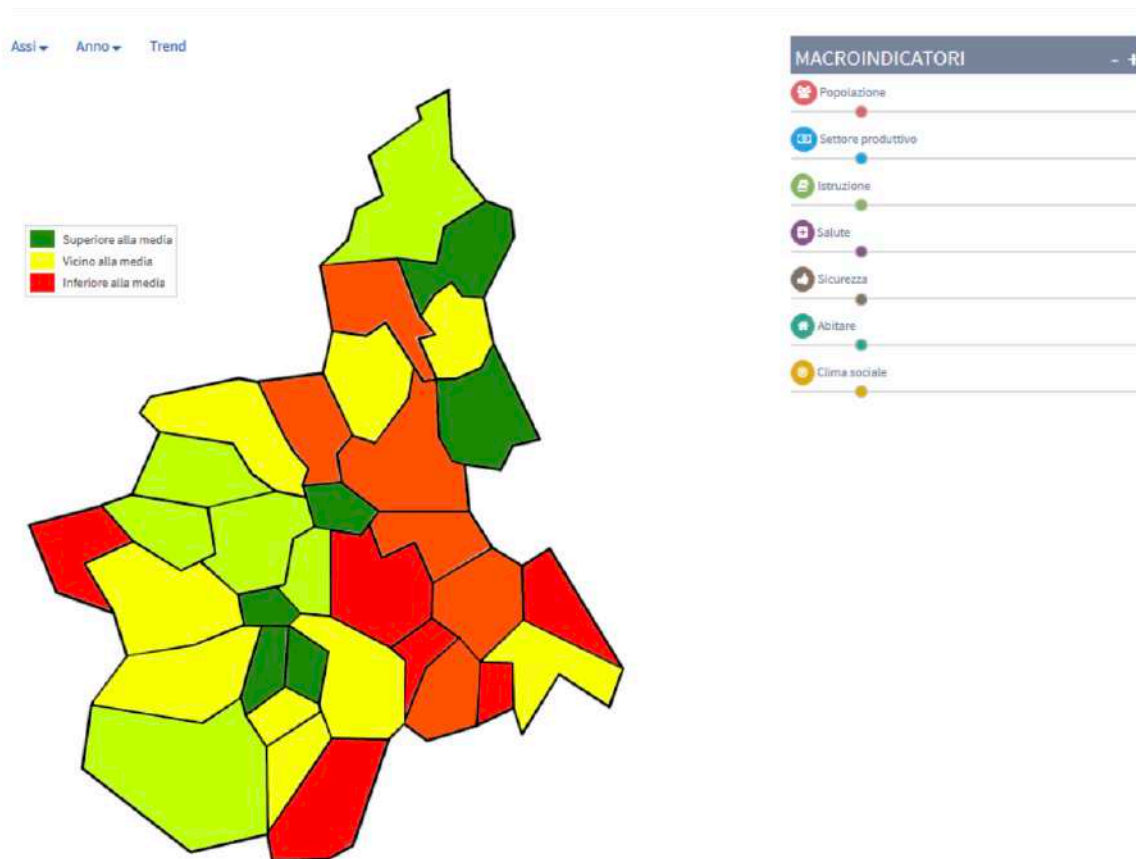
Map 17: Economy and society 2016 in Piemonte AIT. Source: Centro Einaudi 2018

Lastly, as anticipated, an interesting element in narrowing the case study came from the territorial dynamics ongoing, in the following paragraph some element that the research will cover more in depth are anticipated.

Considering socio- economic dynamics, the area (intermediate areas inside the triangle) is characterized by an important demographic decline and fragility, with the consequence of high average age (Centro Einaudi 2018 Centro Einaudi 2022). In addition, lines of weakness in the employment sector are highlighted, albeit differentiated within the area, as well as vulnerability in the production systems and the entrepreneurial network, which is reflected in the difficulty of returning to pre-crisis growth levels.

The same report edited in 2022 (Centro Einaudi 2022 p. 9) highlighted how the demographic situation of the Southern Easter area is more critical than the Piedmont average as well the decline in the number of residents is more pronounced and so is ageing and the average age is higher than in the rest of the region.

Following maps help in approaching these issues. The selected area presents stagnation and demographic crisis in discontinuity with the growth of neighboring areas.
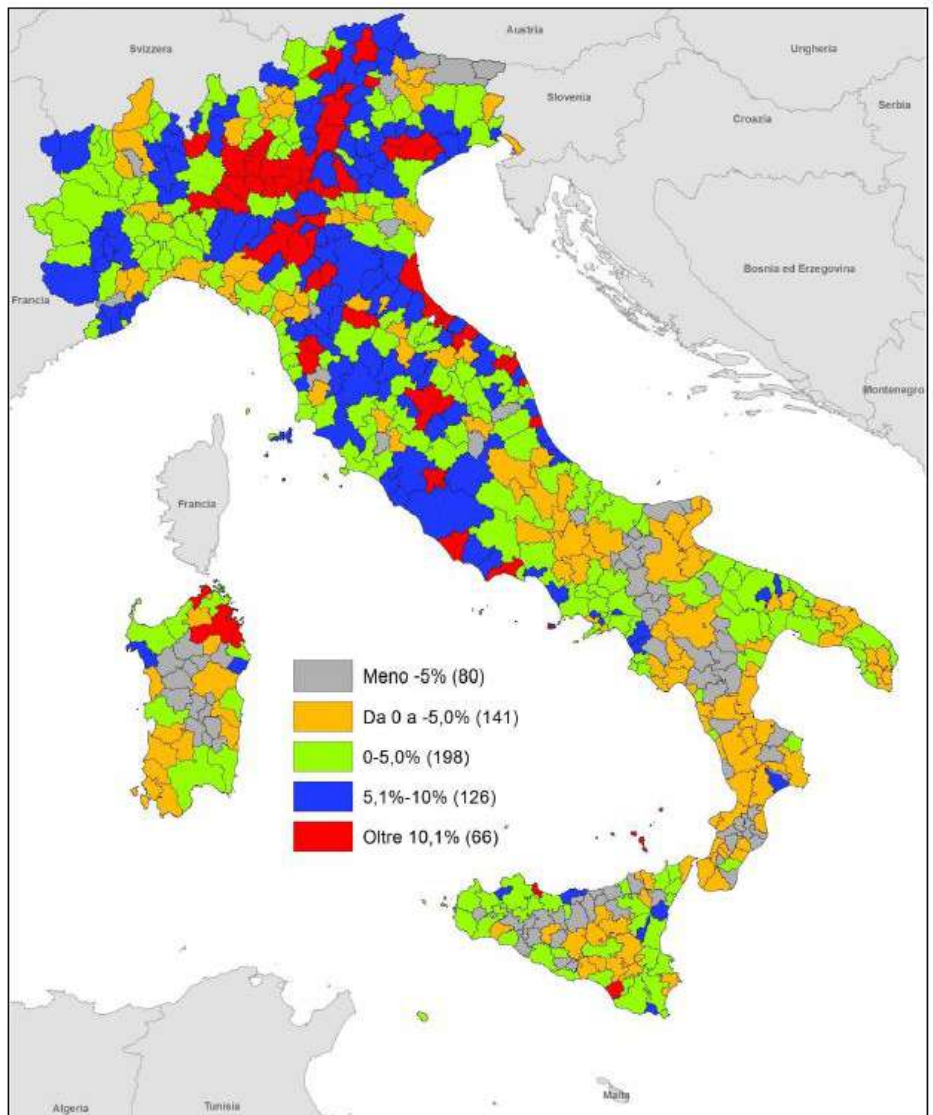
Map 18: Percentage change in resident population by local labour system 2011. Years 2001 - 2011.
Source: ISTAT

2) These negative trends are visibile also by looking (tab 12) briefly at the demographic trends (1991 - 2001) of the cores of the LLMs of the area, the research will focus more specifically to the context with more negative trends.

Town	Prov	Inhabitants 1991	Inhabitants 2021	Variation %
Asti	AT	77388	74348	-0,04
Canelli	AT	10843	10165	-6,25%
Alessandria	AL	94932	92104	-2,98%
Nizza Monferrato	AL	10443	10197	-2,36%
Ovada	AL	12623	10971	-13,09%
Valenza	AL	22012	18239	-17,14%
Acqui Terme	AL	21077	19493	-7,52%
Casale Monferrato	AL	40592	33213	-18,18%
Novi Ligure	AL	31182	27786	-10,89%
Tortona	AL	28279	27092	-4,20%
Vercelli	VC	51514	45875	-10,95%
Santhià	VC	9616	8125	-15,51%
Novara	NO	103966	101916	-1,97%
Biella	BL	50397	43663	-13,36%
Cossato	BL	15835	14149	-10,65%
Pavia	PV	80289	70971	-11,61%
Voghera	PV	41904	38592	-7,90%
Sannazzaro de' Burgondi	PV	5797	5143	-11,28%
Stradella	PV	11599	11539	-0,52%
Vigevano	PV	62514	62108	-0,65%
Cremona	CR	76949	71523	-7,05%
Crema	CR	34322	34242	-0,23%
Piacenza	PC	104385	103294	-1,05%
Lodi Vecchio	LO	42466	44574	4,96%
Castel San Giovanni	PC	11853	13709	15,66%
Fiorenzuola d'Arda	PC	13394	14779	10,34%

Casalmaggiore	CR	13437	15127	12,58%
Alba	CN	30782	31215	1,41%
Bra	CN	28038	29466	5,09%
Ceva	CN	5696	5609	-1,53%
Cuneo	CN	58114	55980	-3,67%
Fossano	CN	24153	24486	1,38%
Mondovì	CN	22931	22264	-2,91%
Saluzzo	CN	16611	17342	4,40%
Savigliano	CN	19623	21442	9,27%

Table 15: Variation population percentage on North West intermediate LLMs core. Author elaboration on ISTAT data

Lastly this map (19, Colleoni 2019) highlights the long-term population variation density (1971 – 2011). Focusing on the axes of the research it is clear the radical difference looking at the Northwest context and the axes that goes towards North East. Between the hinterland areas of Turin and Milan we can see an area that knows a constant process of depopulation that matches with the case study selected.
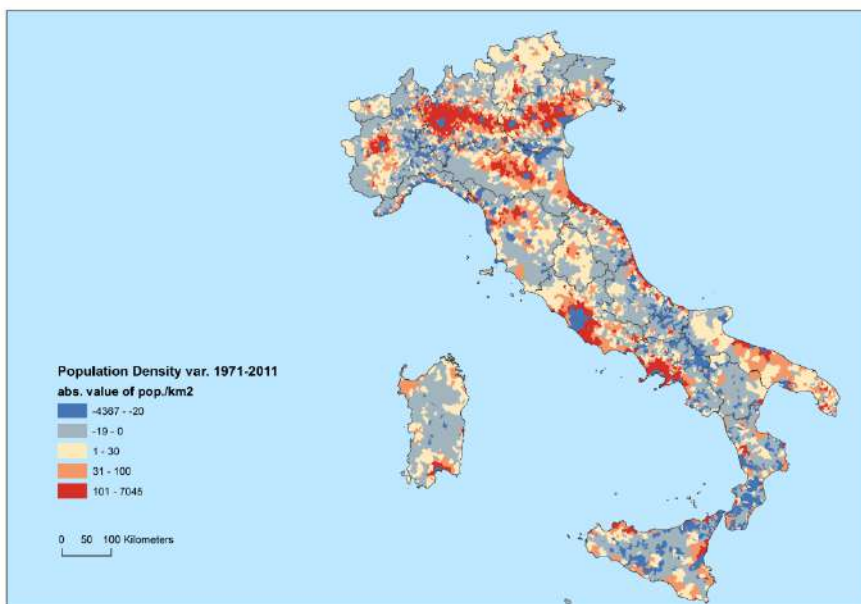
Map 19: Population density variation 1971 - 2011. Source: Colleoni 2019

Looking at the economic dynamics it is highlight how the long-term economic transition out of a production-centered economic system and the shorter-term one marked by the 2007 economic crisis

were characterized by the difficulty, in the intermediate areas inside the triangle, of producing local and territorial development alternatives.

According to Ires (the Institute of Social and Economic research in Piedmont region), this has translated into «stagnation and immobility with few development prospects for the future, especially due to the high rate of population ageing, the depopulation and unemployment (especially among young people) » (Centro Einaudi, 2018 p. 41).

At the same time, albeit the production side is highly specialized, the economy of the area is suffering due to crisis and relevant failures) with important relations to the occupational aspects. More generally indicators related to the social atmosphere (clima sociale) show a predominantly pessimistic attitude towards the future.

The risk factors underlined, above all for the central areas of the provinces of Asti and Alessandria, can be found in the «quantitative reduce of the human factor, above all in its young people, and in its characterization as an *inter-metropolitan middle area*, whose accessibility could constitute not only a factor of attraction but also of outflow».

This frame is combined with two factors that should be emphasized: first, a «cultural-recreational endowment below the regional average» only partially counterbalanced by the growing rate of tourist accommodation and attractiveness (Centro Einaudi, 2018), and second, environmental fragility, both in terms of hydrogeology and the presence of highly polluted sites inherited from the intensive industrial exploitation of some areas (see the important case of Casale Monferrato).

4.1.3 The moving of the triangle following different corridors

As previously mentioned,[17] from a brief overview of demographic data presented, the demographic growth dynamics mainly regard the axis that moves from Milan towards the East, a symptom of a deep redefinition of territorial arrangements in Northern Italy.

As well as from a demographic point of view, the issue has been highlighted on an economic level. In fact, in light of the reorganization of the economic structures, such as the progressive loss of entrenchment and importance of big industrial players that had shaped and made strong the triangle of historical industrial production, we could empathize a passage from the historical industrial triangle in North West towards East (Viesti 2021 p. 176) and the shaping of a net of intense relationship between Milan, Venice and Bologna (and cities such as: Brescia, Verona, Padova and so on), a

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[17] Come accennato da uno sguardo ai dati demografici e alla mappa della variazione della popolazione, de dinamiche demografiche di crescita interessano soprattutto l'asse che da Milano muove verso Est, sintomo di una crescita oltre che demografica e di una ridefinizione profonda degli assetti territoriali nel Nord Italia.

potential emerging triangle that from Milano goes towards the North East, substantiated by a functional network constituted by axes of road mobility (Highway A4 and Via Emilia), and of rail mobility (High Speed line) and innervated by territorial development, entrepreneurial and infrastructural *diffusive*, although not free from many risks of spatial hierarchization (Fabian and Pellegrini, eds, 2012), indeed, the intermediate areas of the North East with their specific history of industrial districts, "has resist differently" to different seasons of crisis.

To focus on intermediate areas within this perspective, mean to consider space as a «flow space» (Garavaglia, 2019) always more intense, in this sense, questions are addressed from one side to the possibilities of areas and town at a (more) lower speed and intensity, from the other side to the measurement of the *corridor* dynamics (Pennati et al, 2019), where they exist, between Milano, Turin and Genoa. Indeed, if in literature, is well highlighted the territorial continuum that is stressed on the form of corridor between Milan, Venice and Trieste (Pennati et al, 2019; Colleoni, 2019), less clear is the situation between main poles of Northwest, emerging a progressive detachment, only in part explained by morphology and agricultural spaces; this project aim to fill those aspects from the perspective of medium size center along and within reference exes.

This point also highlights the role of the corridors in framing the phenomenon and framing relevant case studies in an innovative way, especially when looking at it from the perspective of infrastructure and mobility dynamics.

A "corridor system", indeed, can be considered as (Garavaglia and Pennati 2016) an analytics tools helpful to read the current territorial reality due to the "multisemantics" distinctive:, within corridor systems conveys urbanization, mobility, socioeconomic development dynamics, but also related to the transnational cooperation, in addition to the definition as infrastructural project *tout court*.
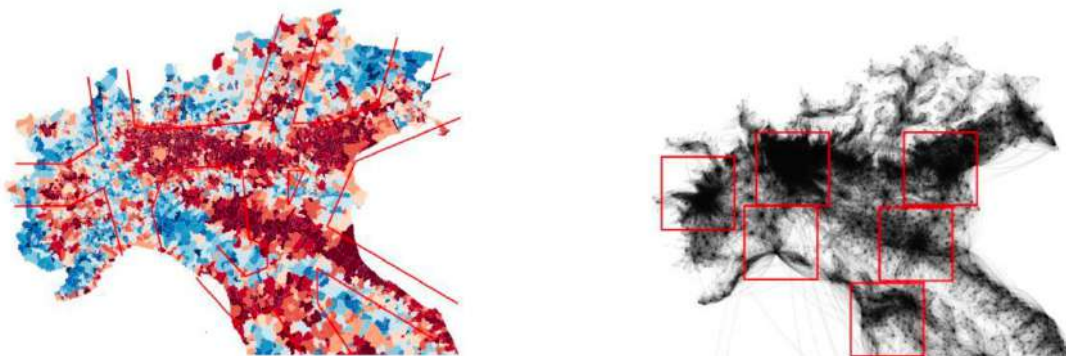
Map 20: Corridor dynamics in North Italy Source: Elaborazioni a cura di PRIN "TERRITORI POST-METROPOLITANI COME FORME URBANE EMERGENTI: LE SFIDE DELLA SOSTENIBILITÀ, ABITABILITÀ E GOVERNABILITÀ", www.postmetropoli.it

A first look at commuting flows and the corridor index (Garavaglia and Pennati 2016) in the considered area shows how the "inside" of the triangle is discontinuous in terms of flows and indicators compared to the corridors and dynamics of the rest of Northern Italy, questions the long-discussed regionalization of the North (Bagnasco 2009; Scott 2001) or the so called Megalopoli Padana (Turri 2000).

This introduction to the issue of corridoriness connects to the last block of reasons behind the choice to investigate the Northwest in relation to mobility processes and the link between territorial and infrastructural transformations. In fact, the two maps above raise questions about the deep transformation of infrastructural systems and related processes in the area.

In this sense, it is highlighted the discrepancy between the strategic centrality and the logistic vocation of the area within the Italian and European infrastructural framework accompanied, however, by a lack of correspondence in terms of effectiveness. The infrastructural node, in heart of the area, is therefore configured simultaneously as a strength and a weakness (Centro Einaudi, 2018). On the one hand, it is clear that the nodal position in the center of the North West is a potential factor of joint planning, in addition to the logistic vocation of exchange between the port of Genoa, the Po Valley and continental Europe and the well equipment in terms of mobility infrastructures (both road and rail), which result in short access times.

On the other hand, is highlighted an infrastructure crisis, especially on the north-south axis in correspondence and around the Genoa node, this has been made evident by the fall of Morandi Bridge in Summer 2018, a macro event in a context of micro everyday events such as congestion, long maintenance work that make difficulty daily mobilities within the metropolitan area and the connection with the other poles. This is combined to the difficult of re positioning due to the absence of fast rail infrastructure in line with higher national and international standards, with the long and tortuous constructive path of Terzo Valico dei Giovi (Centro Einaudi, 2018).

Last weakness of mobility infrastructure in the area can be considered as a general observation regarding the accessibility to public transport in the area, that this work will investigate. Indeed, while a polycentric network has been inherited from the past, however, the high rate of motorisation, depopulation processes and high territorial dispersion mean that investment in very expensive public transport is unattractive.
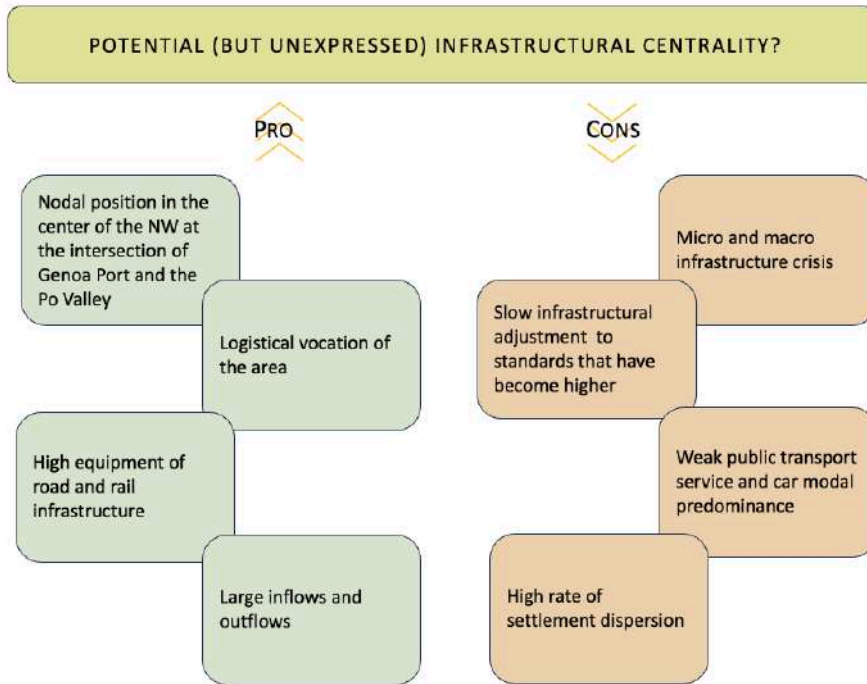
Figure 11: Potential (but unexpressed) infrastructure centrality in the area. Source: elaboration of the authors on Ires (2018) data

As evidenced in these pages, the territory under examination has been extensively investigated by the literature, which has partially constructed its lexicon on territorial characterizations precisely from these territories.

This research therefore has no claim to exhaustiveness with respect to the exclusively territorial sphere, when the interest, as highlighted in the theoretical chapter, of navigating the more or less recent works on the subject, within a perspective that is partly documentary and partly instrumental to the final objectives of the research.
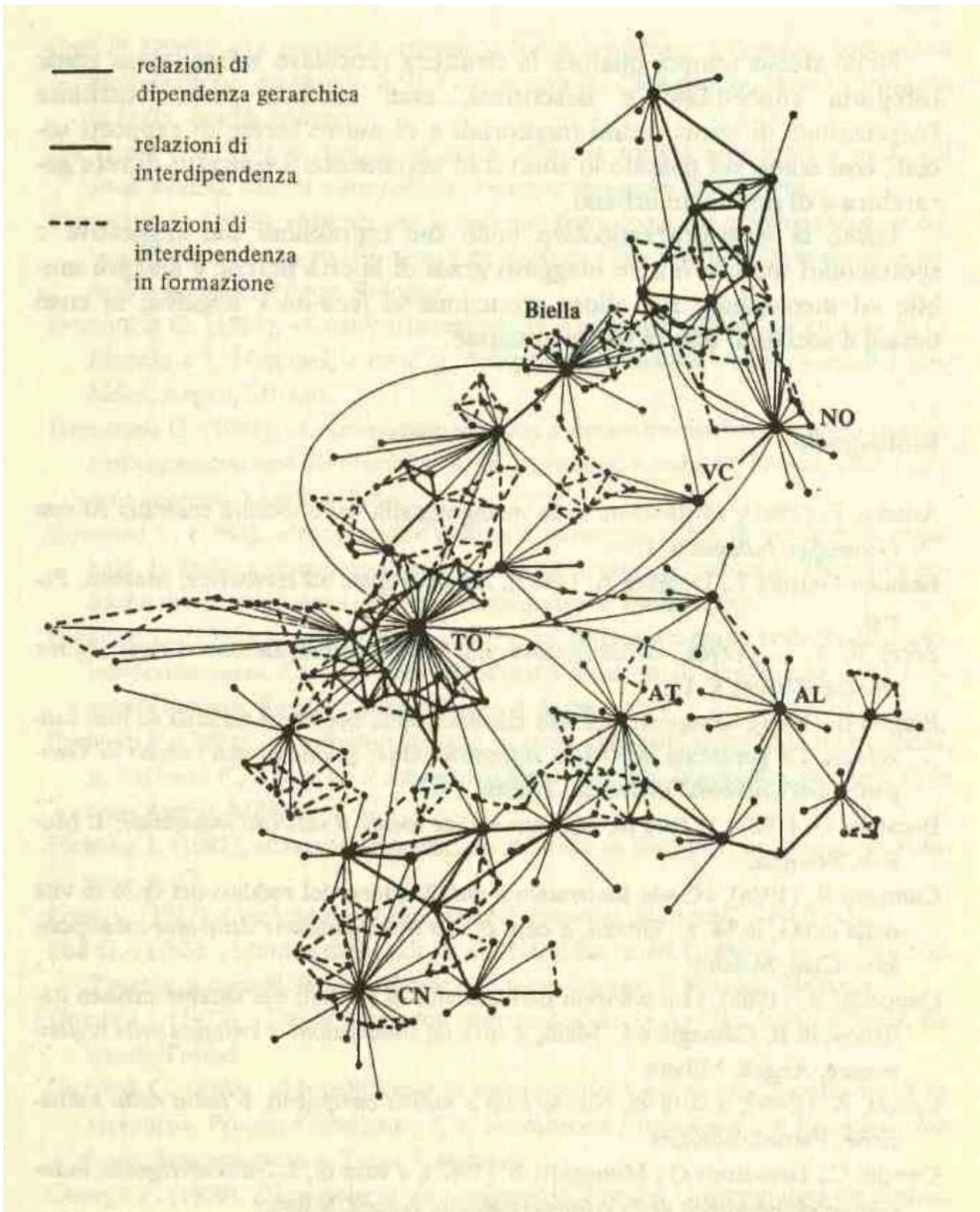
Map 21: Representative graph of the current relationships between the centres of the urban network. Source: Emanuel 1988

4.2 DIFFERENT LAYERS OF TIME

In the same way as space, in research it is important to delimit temporal boundaries to circumscribe the work, especially if, as in this case, it is concerned with describing and analysing transformation processes.

If the territorial and urban disciplines are more familiar setting a specific where, in the processes of transformation of the territory defining when of events, and the chronological time span in which they occur is equally important.

In this sense, this paragraph is focused on presenting the time framework and the elements that have been considered in circumscribe it, according to the interests of the research work.

4.2.1 The time of the research, of the field and of pandemic

È stato necessario individuare degli avvenimenti, che chiamiamo eventi critici (G. Grossi, 1985). Con questo termine intendiamo quegli episodi che segnano un momento di rottura e che, per la loro singolarità, rappresentano un passaggio (Chiaramonte and Senaldi 2015).

A first temporal element that this research faced is constituted by the periods and times of empirical work placed as well in the pandemic and post pandemic context.

Indeed, this research followed a qualitative approach with same periods of ethnographic field. Specifically, the time of the research, that was rooted in a previous work conducted between 2018 and 2019, first encountered and had to deal with the risks associated with the 2020 Covid 19 pandemic. The pandemic has radically impacted the shared conception of time both in the peak of the crisis and in what has been narrated and defined as a 'return to normality' and has left its marks on our daily lives in different ways for everyone.

The time of Covid has profoundly crushed in this research by placing it within a much more aggressive spectrum of uncertainty with respect to both the course of the field and the general organisation and confidence of the doctorate path.

Thus, in an uncertain time, the research was launched and the most strictly field period lasted from December 2021 to March 2022 and then resumed between September 2022 and January 2023.

Secondly, as also discussed in literature, detaching research time, especially if qualitative and 'in the field' from personal time may not always be a simple exercise. In fact, a complex dynamic is

configured in terms of participation between the researcher and the "researched", a continuous redefinition between participation and observation: the time of science and that of personal life have found themselves reunited in the human and subjective figure of the ethnographer (Robinow, 1977 in Semi, 2010). One's own biographical trajectories - human, political, geographical, etc. - necessarily influence the research project and path, especially if the researcher himself is subject to the same studied practices.

Between researcher and "researched", in the field, complex dynamics are created, in which the different theoretical distances are reconnected in the practice of co - presence and proximity, with the participatory praxis, the ethnographer - whether distant or not from the 'intellectual' point of view - finds himself - in a dual way - inside and immersed in the processes he studies, in this sense, the relationship with living persons, who have agency and not with inanimate objects, texts, people, or historicised phenomena has intrinsic ethical and political implications.

In the ethnographic relationship, in the "mutual recognition", in living with and living as (Semi, 2010) the distance/proximity dynamic is redeclined in a relational key in the field within a continuum of proximity constituted by more or less evident similarities such as gender, age, skin colour, socio-economic background, etc., which is configured as a variable of the receiving of data, the empirical gaze and results.

At the same time, the embedding of Urban Studies within the (more or less complex) field of the city and the territory implies a continuous close encounter and relationship with institutions, politicians, administrators, bodies, associations, as well as with residents, commuters, travellers, city users, workers, retired people, etc. involved in more or less conflicting dynamics with which the researcher finds himself engaged to varying degrees of involvement and 'neutrality'. These conflictual dynamics concern not only power relations but also temporal conflicts and different rhythms of experiencing the city, the territory and its infrastructure.

Lastly, an element to emphasise when looking at the "time of the field" and research concerns the fact that the time of research and the time of processes do not coincide: what is urgent in practice is not equally analysable in the short term by research. Secondly, behind every political process, at whatever level of scale it occurs, there insist complex dynamics that are difficult to understand not only at a first approach but also at a 'curious but detached' approach, there are unspoken in 'communities' that are difficult to read for the researcher not directly involved in that space of relationship there, there will be doors that will be closed and discourses that are never fully

comprehensible. The researcher cannot quickly overlook the lines of force that run through the field, at the same time for the understanding of these a deep presence is needed, a relationship that can sometimes build up not only after a long time but after one's own self-questioning.

4.2.2 Biographical time

Furthermore, among the instruments and the methodological approach considered by the research related to the conceptualization of time and its circumscription, the mobility biographies research approach in interviews (Rau and Sattlegger, 2018; Greene and Rau 2018; Lanzendorf 2003) and the life mobility maps are suggested as useful tools within the greater toolbox of the so called "mobile methods" (Urry 2007).

The "biographical approach" to the interviews implies the choice to look at the interviewees' mobility practices, styles and means of mobility through a long-term perspective. With the aid of "life mobility maps" (Vendemmia, 2020), on the other hand, it is possible to visualize mobile biographies, mental maps, territorial perceptions, of distances and of the different "territorial speeds".

Life mobility maps[18] were used as exploratory tools with the different aims of i) reading the different anchorages of people and ii) mapping the spatial perception of infrastructural changes and how these led to modal, trip and more generally life choices. Through this tool, as will be argued further in the analysis, it is possible to interweave mobile biographies with geographies of travel.

This methodological approach may also be promising to explore in future research on mobility from the sociological perspective because it is rooted within research streams distinctly peculiar to the Social Sciences such as research on the life courses of individuals (life course approach) (Scherer 2013), an approach that emphasises the processual and dynamic character of social phenomena and their rootedness in a collective and historical dimension.

This approach can also be linked to the tradition of the biographical interview developed within the so-called qualitative sociological research methodologies (Bichi 2007). The purpose of biographical interviews is to shed light on the "social world" of the interviewee in respect of his or her universe of meaning through the formulation of an interpretative model capable of explaining and understanding

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[18] b) Le Life mobility maps sono state usate come strumenti esplorativi con i diversi obiettivi di i) leggere i diversi ancoraggi delle persone e ii) mappare la percezione territoriale dei cambiamenti infrastrutturali e come questi hanno indotto a cambiamenti modali, di percorso e più in generale scelte di vita. Attraverso questo strumento, come si argomenterà più approfonditamente nell'analisi è possibile intrecciare le biografie mobili con le geografie di spostamento.

the logics of action, functioning, processes of change, production and reproduction of the "social world" or of the "situational cathegory" analyzed.

The biographical interview is the narration - as honest and complete as possible, given by a person to a researcher who guides the interview - of a segment of one's own experience or of the entire course of one's life. It is composed of what the person chooses to tell, remembers and wants others to know. What characterizes the biographical interview in comparison with other types of interviews is the different understanding of the interviewees' word status, which is subject to a 'biographical pact' at the beginning of the interview from which trust and accuracy in the answers follow (Bichi 2007).

On the basis of different degrees of directness a distinction is made between 'life stories' and 'life histories'. In the life stories the object of interest is previously made explicit and agreed between the interviewer and the interviewee, on the other hand in the life history the directivity is less and the interviewee is left free to move around within his or her memory grasping what his or her 'universe of meaning' suggests.

In the case of the story of life (Bertaux 1999), the interview focuses on a specific sphere of life (i.e. mobility), to identify the mechanisms and social processes that regulate it. The initial assignment directs the interview towards a specific topic by delimiting a limited narrative space, the direction of the story is, in this sense, co-determined: the interview is configured as a fully-fledged social action in which two actors act intentionally with reference to each other. By 'history of life', according to Atkinson (1998) on the other hand, we mean a story told that a person chooses to tell about the life he or she has lived (or a life such as work), it consists of what the person remembers of his or her life and the aspects of it that the person wants others to know.

In resonance with these methodological attempts, within the field of Mobility Studies, literature highlights the potentiality of the "mobility biographies research" (MBR) that allow to investigate "the transformation of individuals' mobility behavior across the life course, including shifts related to key life events" (Rau and Sattlegger 2017).

Lanzendorf (2003) was one of the first to apply the biographical perspective to short-term mobility decisions such as modal choice. His approach to MBR emphasised how the habitual, routinised character of everyday mobility generates relatively stable practices that are only occasionally interrupted by life-course trajectories and life events.

In line with this, in this research, it was decided to focus part of the interviews to investigating how one's "modal portfolio" has changed over the course of one's life and how the disposition towards it has changed.

In addition, the interviewees were asked to provide their own commuting stories, investigating from a long-term perspective how the possibilities of mobility by train and more generally by public transport have changed from the user's point of view and changed the shape of their routes. In this way, it was possible to retrace the main stages of the railway transformation in Italy and in the study area, also starting from shared memories common among several interviewees. It was possible to see how the temporal junctions, the events of the railway transformation impacted on mobility choices, first of all, but also on life choices (housing, work, etc.).

This long-term approach also makes it possible to read "the social life of infrastructures" over time, reading the transformation of the social rootedness of the railway infrastructure (i.e. the station and its bar for a community, the remodelling of service timetables, the change from rail to bus of a line) in an area.

In this sense, Rau and Sattlegger (2018) suggest as a strategy for the mobility biographies research to "to divide the life course into discrete events and to connect these to changes in the wider socio-material environment (e.g. policy, infrastructure).

Indeed, the change may regard contemporary personal habits and material – infrastructural innovations as well as the intervened result.

Thus, it is useful to distinguish between general life events such as changes in employment, residential location, or household composition and explicitly mobility-related events or 'mobility milestones' (Rau and Manton 2016) like the acquisition of a driving licence or the purchase of a car/bicycle. From this viewpoint, people's mobility behaviour displays considerable continuity over time, only to be interrupted by significant life events or transitions (Rau and Sattlegger 2018). Indeed, it is deeply argued in literature that the moments in which individuals are most likely to make a modal shift are the moments of transition between one status and another in which habits are reshaped: moments of generational transition, such as the transition to adulthood, or even moments of life transition such as relocation (Colleoni 2019) .

In this sense, useful tools are represented by "Mobility timelines": drawings of interviewees' mobility practices across the life course and their links with significant life events and mobility milestones complemented the interviews. It may be interesting at that point to superimpose this map on the map of changes in rail service and infrastructure.

To sum up, biographical and practice theory in Social Science approach to Mobility Studies can be promising and coherent since it allow to look at the more general topic of the reproduction of practices from the perspective of the social relations and at the same time form the perspective of socio technical argument maintaining the specific positioning of users and travelers.

Both life mobility maps and biographical approach to the interviews together are anchored to the temporal, spatial and territorial context explicitly and self-reflectively, allowing to add a significant piece to the expressive pattern of meaning behind the different modal choices and moving trajectories[19].

4.2.3 Infrastructural time transformation

Intertwined with the time of the field, biographies and pandemics is the time of infrastructure and its changes, which allow the research to be anchored within a transformative framework and a relevant acceleration. This means that, as already pointed out, railway infrastructures in the European and Italian context have undergone a remarkable transformation since the late 1990s. This transformation has changed the railway service landscape in a differentiated way in different scalar and geographical contexts and for different categories and types of users.

The temporal references of these changes allow the research to be anchored to explicit temporal referents and to be segmented in some thematic references in particular.

Thus the research " moves from the 1990s, then focuses on a number of relevant time nodes such as the divisionalisation of the company and consequently of the service, which passes through regionalisation, the launch of the high-speed railway: steps that all together lead to what is known in the literature as the "railway revolution" (Maggi 2007).

These explicit key dates of railway change enable to define timeframes concerning the transformation of the railway sector tout court, of the major players and how this affects services and mobility demand.

"Infrastructural time" can also be read more subtly through the working biographies of employees and, above all, former employees. In continuity with the previous work, in parallel but less relevant in terms of number of interviews, the subject of the working biographies of train conductors, station

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[19] the participants' biographical narratives are always related to their temporal, spatial and social contexts (Jackson & Russel, 2010). Narratives refer to the expression and participant's subjective meaning of the experienced events, but can also consist of reflective passages offering possible insight into the extent to which events might have developed differently if participants had made other decisions (Schütze, 2008).

managers and retired staff was explored, allowing to provide an insight into their working history, the time of work and its transformations in the perception of those who have experienced them "from the inside". The time layer of biographies is thus intertwined with the time of infrastructural transformation in the words and life stories, in long-term notes, memories and recollections.

This level of infrastructural transformation can also be read as the time of the institutional transformation, of the regulatory and functioning framework in which processes take place, both infrastructural but above all in the more general local and territorial governance entanglements. For example, in this sense, a relevant step is represented by the establishment of the so-called metropolitan cities, and more gin general with respect to the progressive transfers of competences in transport governance.

4.2.4 Statistics time

Lastly, a temporal element that the research takes into consideration is the time of the statistics that serve as temporal reference points in defining the time intervals within which to quantify change. Specifically, to better fit the reasoning made earlier, the phenomena will be investigated from the 1991 census up to the current permanent census (2021) in accordance with the possibilities to reach the data since different sources. Some other elements on this topic will be given in Chapter 5.3.

4.2.5 Urban and urbanization time

On the sidelines and in relation with these processes there's the long – term time of territorial transformation that this work deepened more clearly in the theoretical chapter.

4.3 TOOLS

4.3.1 Mobile rules in methods

As introduced in the methodological premises of the first chapter (1.5.2), mobility is a complex object to unravel and this work try to investigate it in its territorial and infrastructural relation through multiple gazes and methodological approaches that return, at least partially, this complexity.

As already mentioned, a relevant lesson about researching mobility derive from Urry (2007) work about mobile methods, that claim for reading contemporary processes and social relations in light of mobility. This statement allows new perspective on qualitative studies but not only, indeed, but mobile rules on methodology can also be applied on different tools of research for example, as this work will explore, socio territorial analysis and institutional and actors analysis.

In summary, the link between mobility, territory and infrastructure can be read in the light of mobile methods, and if this appears more evident in the analysis of practices, it may also be true for spatial and infrastructural analysis. First, regarding the relation between mobile methods and socio territorial analysis some elements can be considered. Mobility lenses, indeed, are crucial and worth investigating the territory within a dynamic perspective. As argued in the theoretical part, territory can be seen as dynamic not only because continuously unstable in time but because defined itself by movement dynamics, such as commuting processes, multilocalism and more in general complex networks that turn territory an object far from being static. In other words, territory are made by people on the move with complex belongings and so its classifications and its names. In this sense, the weight of mobility in the definition of territorial settings goes through the inquiry of movements changes, the number or trips, towards where, with which mean of transport, and so on and so forth. In conclusion, including mobile rules on socio territorial analyses means considering mobility as a crucial definitor and indicator in territorial classifications. In lights of mobile turn is no longer possible not to include mobility dynamics in the definition of the territorial aspects of a context both in definitory and, according to the aims of research, processual terms.

Moreover, mobile rules are translated into infrastructural analysis in different ways. First, the affirmation that understanding mobility infrastructure nowadays is a crucial mean of reading territorial transformations. Secondly, this pass through a not obvious mobile sector analysis that assumes, for example, that this can be re-read in the component of practices. Railway can be indeed considered as a complex field where multiple layers and possible point of contact exist; in this sense the analyses of railway can be translated in several different approaches. Starting from the triple

perspective users, service and environment, different actors have been considered of course workers, retired, trade unions and associations, of course commuters travelers and association of commuters but as well all that are around railway that is not directly railway (so more accessible), but that at the same time produce knowledge about the topic, so I think about passionate, libraries, associations, modelist, people who participate in forum and social networks groups. But also, as chapter 6 will explore in detail, railway can be read as an *institutional* object whose transformation as an organization is worth being investigated for the complex consequences in territorial landscape.

In this aspect, mobile methods in the vector analysis can be combined with the suggestion of *ethnography of infrastructure* that means reading infrastructural dynamics «from the inside out», reversing the infrastructure in their practical nexus, through the multilayered interest on the elements that move the infrastructure, the strategies, the divisional organization and clearly the transformation. To sum up, the methodological approach of the research mobilized multiple tools that can be reconducted towards three main streams: territorial, social practices and institutional analysis. Given in this introduction the common framework in which they are inserted each chapter will introduce more extensively the methodological steps.

Last methodological aspect regard the three positioning that the research maintain. To the three seen typologies of analysis: mobile, infrastructural and territorial correspond the three objects and subjects of the research: the territorial unit of measure, only apparently static with inhabitants, attenders of the stations, the second infrastructural, that as mention reverse from the inside out the multiple characteristic of the mobile infrastructure and last the one on the move, in terms of social practices of mobility in space.

Limits of this methodological approach consist in the risky and challenging combination and harmonization between scales and different levels at stake. The three main flows of the research risk to remain as pieces not completely coherent of the same puzzle for example visibile in the combination between the sovra regional scale premises of the research and the local vocation of ethnography.

CHAPTER 5 – DEFINING AND FRAMING *INTERMEDIATE AREAS* OF NW ITALY: A SOCIO TERRITORIAL ANALYSIS

5.1 Defining and mapping territorial marginalization of intermediate areas

To achieve the socio-territorial objectives, the initial methodological goal was to define the specific research area, identifying the criteria for what are termed "intermediate areas." Several descriptors of territorial organization have been considered, drawing from the literature. These include the municipal administrative level, functional urban areas (FUA) as proposed at the European level, Local Labor Markets (LLMs) defined by Istat, and region-specific models such as AIT (Areas of Territorial Intervention) used in the Piedmont context (Dematteis, 2016). Additionally, the Postmetropoli framework (Balducci, Fedeli, Curci, eds., 2017) and the territorial classification outlined by the National Strategy for Inner Areas (SNAI, 2014; De Rossi, eds., 2018) have been examined.

There are two main reasons for prioritizing this latter classification: first, SNAI's categorization aligns with the focus of this research, as emphasized in the theoretical chapter. Second, one of the foundational principles of this study involves a "subtractive" approach to defining intermediate areas—neither metropolitan core nor inner areas (Lanzani et al., 2020). Accordingly, I chose to conduct an initial exploratory analysis using SNAI data.

In identifying *peripheral* areas, SNAI classification moves beyond the traditional criteria of distance from major urban centers (e.g., those with populations greater than 35,000 inhabitants) proposing instead a territorial perspective that accounts for spatial and temporal distances from the so-called "service centers" (centri di offerta dei servizi), which define «the quality of life for citizens and their level of social inclusion» (SNAI, 2014). The key services identified by SNAI include a comprehensive secondary education system, at least a first-level hospital, and a railway station (silver level 3). These services underscore the historical significance of healthcare, education, and mobility in ensuring the "full exercise of citizenship rights."
Based on the identification of centers (both poles and "aggregates of municipalities"), four categories of inner areas are delineated: belt areas, intermediate areas, peripheral areas, and ultra-peripheral areas. These classifications are derived from an accessibility indicator, measured by the travel time in minutes to the nearest pole (see Table 13).

Graph 7: Municipalities' classification due to remoteness levels. Source: SNAI (2014)

While inner areas are methodologically defined by their distance from "essential" services, this definition can be further enriched by incorporating broader demographic and socio-economic dimensions, offering a more comprehensive understanding of local development dynamics.

Focusing only on the belt and intermediate areas, I conducted a preliminary analysis of the percentage distribution of municipalities, as classified by the SNAI framework, within the regions of Liguria, Piedmont, and Lombardy. This analysis also examined the availability of essential services in these areas, as detailed in Table 14.

Typology	> 10.000 In.	> 20.000 In.	Hospitals	Schools	Railways	2 Indicators (+)
AREE INTERMEDIE (intermediate areas)	1,90%	-	0,40%	2,30%	3,20%	0,22%
AREE DI CINTURA (belt areas)	10,20%	2,37%	0,44%	3,48%	7,94%	1,87%
POLI INTERCOMUNALI (Intermunicipal Poles)	71,42%	42,80%	42,80%	51,42%	62,85%	0,88%
POLI (Poles)	100%	100%	100%	100%	100%	100%

Table 16: SNAI Classification of Piemonte, Lombardia and Liguria regions per typology and services. Author elaboration on Snai Data (2014)

As shown in Table 2, the so-called "intermediate" areas, as defined by the SNAI classification, are typically characterized by modest population figures and a limited provision of essential services. Given the aims of this study, I decided to broaden the scope to include other types of areas, incorporating new criteria and methods of territorial analysis.

This project, therefore, proposes an alternative territorial classification that does not completely discard the SNAI framework but rather integrates it. Furthermore, as discussed in the theoretical section on accessibility, Vendemmia, Pucci, and Beria (2021) argue that «geographical distance from key services is not a sufficient condition to ensure access to them, nor to prevent the emergence of marginalization, which may arise due to economic or attitudinal barriers» (p. 6). They challenge the "institutional classification of peripherality," proposing a more nuanced view of territorial disadvantages, based on a multidimensional approach to marginality, incorporating demographic, socio-economic, and mobility indicators. They further highlight the socio-economic diversity within similarly classified marginal areas, where the SNAI's spatial distance indicators fall short in fully capturing this complexity.

Marginality, therefore, is explored through the lens of the relationship between mobility as a social, spatial, and temporal practice, and socio-economic variables, analyzing how (im)mobility, transport poverty, and social exclusion are intertwined (Vendemmia et al., 2021, p. 2).

Additionally, as discussed in the theoretical chapter, other recent classifications have emerged in the literature that expand the analysis of intermediate areas, such as those proposed by Caramaschi and colleagues (2023), Curci and colleagues (2023), and the GRINS project (2023).

5.2 Results of mapping intermediate areas

The first paragraph will delve into the territorial classification, the second will provide insights into the relevant indicators and dynamics, the third will offer a broader discussion of the classification tool, and finally, some concluding remarks will be presented.

In line with the previously discussed aspects, this chapter aims to specifically address the following objectives and research questions (1.3).

i) To provide an operational definition of intermediate areas in Italy (5.3.1)

ii) To provide insights about intermediate morphologies in Italy

iii) To provide a portrait of the intermediate presence in Italy

iv) To discuss dimensions and indicators relevant to operationalize and to map intermediate areas in Italy. (5.3.2)

v) To discuss how a multiple composition of indicators (demographic, social, economic, real estate, environment, service, accessibility and mobility, digital, tourism and cultural) allow to visualize the ongoing territorial transformation in intermediate areas in Italy (5.3.2)

vi) What social, economic, environmental, centrality, and cultural variables mediate the ongoing territorial transformation in intermediate areas in Italy?

vii) What is the socio-economic, demographic, environmental and cultural landscape in the intermediate areas today?

viii) What is the state of basic service infrastructure accessibility in intermediate areas today? What is the degree of "metropolitan function" in the area?

ix) What are the main mobile patterns in terms of trips in the case study?

x) How processes of polycentrism, hierarchization and marginalization act today in intermediate areas of Italy?

xi) Given a definition of spatial marginalization can we identify such dynamics in intermediate areas?

5.2.1 MORPHOLOGIES. A proposal for the classification of intermediate areas in Italy

In light of the limitations presented in the previous paragraphs, which highlight the difficulty in distinguishing the specificities of intermediate areas in Italy, there is a need to develop new territorial metrics. These metrics should reflect the ongoing dynamics and transformations in a complex manner. This paragraph is therefore dedicated to presenting a methodological proposal aimed at identifying intermediate areas in Italy.

The result map (map 13) of intermediate areas in Italy is the result of the matrix of different type of approach and data: demographic, functional, accessibility and territorial contiguity.

This paragraph illustrates the path that led to the definition of the map.
First, in line with the previous paragraph, the intermediate areas as conceived by the SNAI strategy were mapped out as follows.

The following map (map 9), developed within a GIS environment, illustrates the intermediate areas according to the SNAI classification: C "belt areas" (Aree di cintura) and D "intermediate areas" (Aree intermedia) are highlighted in yellow. As can be observed, a considerable portion of the national territory can be classified as C and D areas, particularly in the Po Valley and along the coastlines. Conversely, the country's major mountain ranges, the Apennines and the Alps, stand out in contrast, marked by peripheral and ultra-peripheral areas and the absence of regional and provincial capitals.

While this classification, relying solely on the SNAI categories, most closely aligns with the notion of intermediate areas as discussed in the theoretical chapter, it still falls short of distinctly defining intermediate areas on a national scale due to the differing objectives of the National Strategy for Inner Areas. As previously articulated, the issue of intermediate areas does not concern access to essential services. On the contrary, intermediate areas often serve as key territorial reference points and connectors for essential services between inner areas and "metropolitan" centers. An analysis of the map reveals that a major limitation of this classification is the omission of provincial capitals (capoluoghi di provincia), which, as highlighted in the theoretical framework, constitute a significant part of the intermediate landscape. The SNAI classification excludes them because they serve as *functional hubs for basic services* and are thus grouped with major urban centers, despite the considerable differences in their roles and territorial functions.

BELT (C) AND INTERMEDIATE AREAS (D)
ACCORDING TO SNAI CLASSIFICATION

0   100   200 km
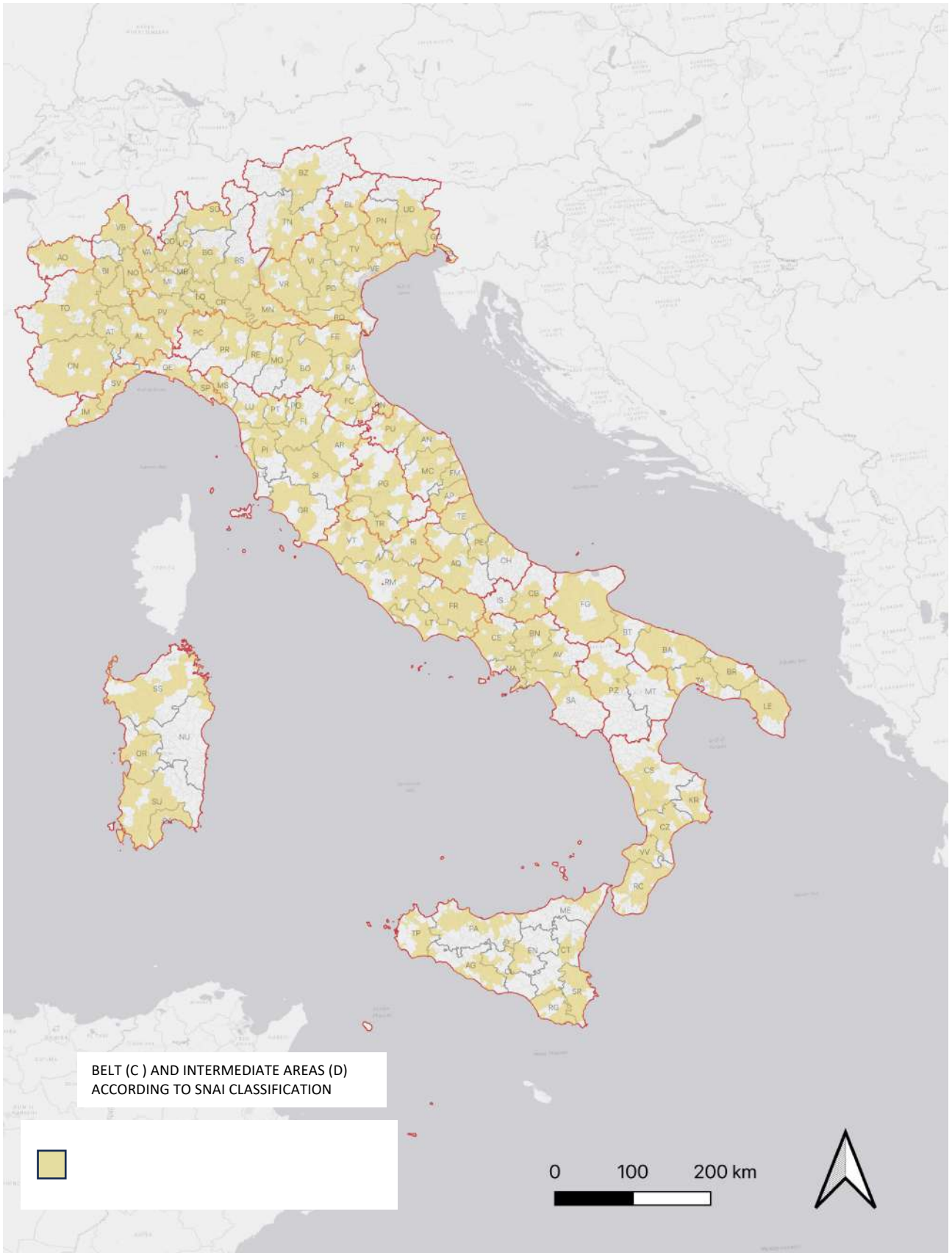
Map 22: Belt and intermediate areas according to Snai classification. Source: UVAL 2014

To address the limitations of the previous representation, a new national territorial classification was developed, still within a GIS environment, which took into account other datasets and existing classifications. In line with the literature, the intermediate areas were identified through a process of subtraction. Specifically, from the total number of Italian municipalities, the ones that the SNAI identifies as peripheral and ultra-peripheral (E, F) were excluded (map 9), as their characteristics, according to the SNAI, do not align with those of intermediate areas.

Various hypotheses for classifying core areas were considered. Metropolitan cities, as conceived by the current legislation on territorial organization, do not adequately reflect the internal territorial variety of these metropolitan cities in terms of "metropolitanity," as they were established by converting the former provinces of the 14 major Italian cities, as already highlighted in the theoretical chapter.

The second analysis considered demographic thresholds; however, this approach failed to take into account important factors such as the demographic heterogeneity of Italian cities in relation to their centrality. Furthermore, it would not have allowed the classification of belt or suburban municipalities as "metropolitan," even though these municipalities specifically characterize the metropolitan landscape in the literature, particularly at the international level.

A dynamic conception of metropolitanity, based on high inward flows and the increasingly evident built-up continuum, suggested considering the Functional Urban Areas (FUAs) (map 11, 12).

In map 6, the light blue areas are intermediate areas as result of a process of substraction: first, pheriferal areas (E, F) (map 10), according to SNAI are not considered; secondly have been removed Commuting Functional Urban Areas (OECD) that exceed 250.000 inhabitants.

Functional Urban Area (FUA) can be considered as a useful proxy for capture the broader influence of urban areas beyond their administrative boundaries, providing a more holistic view of urban development and centrality. As reminded, Functional urban areas are the result of a "core city" that is the "main urban center with a dense population and concentrated economic activities" and a "commuting zone", that are the "Surrounding areas with lower population density but strong economic links to the core, primarily through labor market integration (measured by commuting rates)" (OECD). As shown in the following map, the OECD identifies as many FUAs in Italy as there are provincial capitals (map 3), mirroring the issue previously mentioned. For this reason, the decision

was made to focus on FUAs with populations exceeding 250,000 inhabitants in the selection of core areas (map 4).

Following maps (map 10 to 16) help approaching better the definition of *intermediate areas* in Italy as proposed by this work.

In map 23 inner areas are visible, in map 24 the Fua proposed by OECD, in map 25 italian Fua that execeed 250.000 inhabitants. Map 23, 24, 25 allow a full picture of the classification.
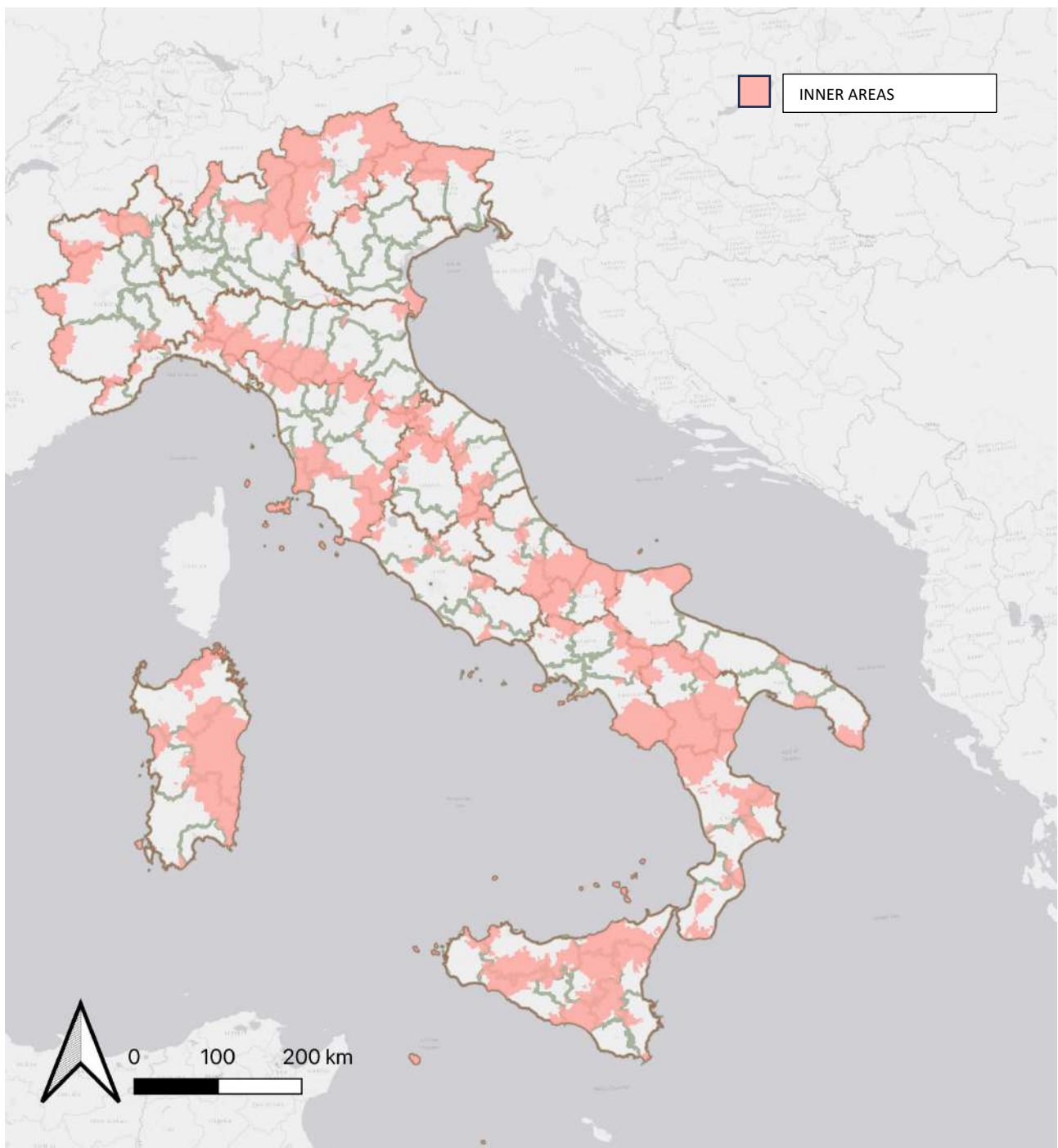
Map 23: Inner areas, Peripheral and ultraperipheral areas (e, f) according to Snai Classification (2014)
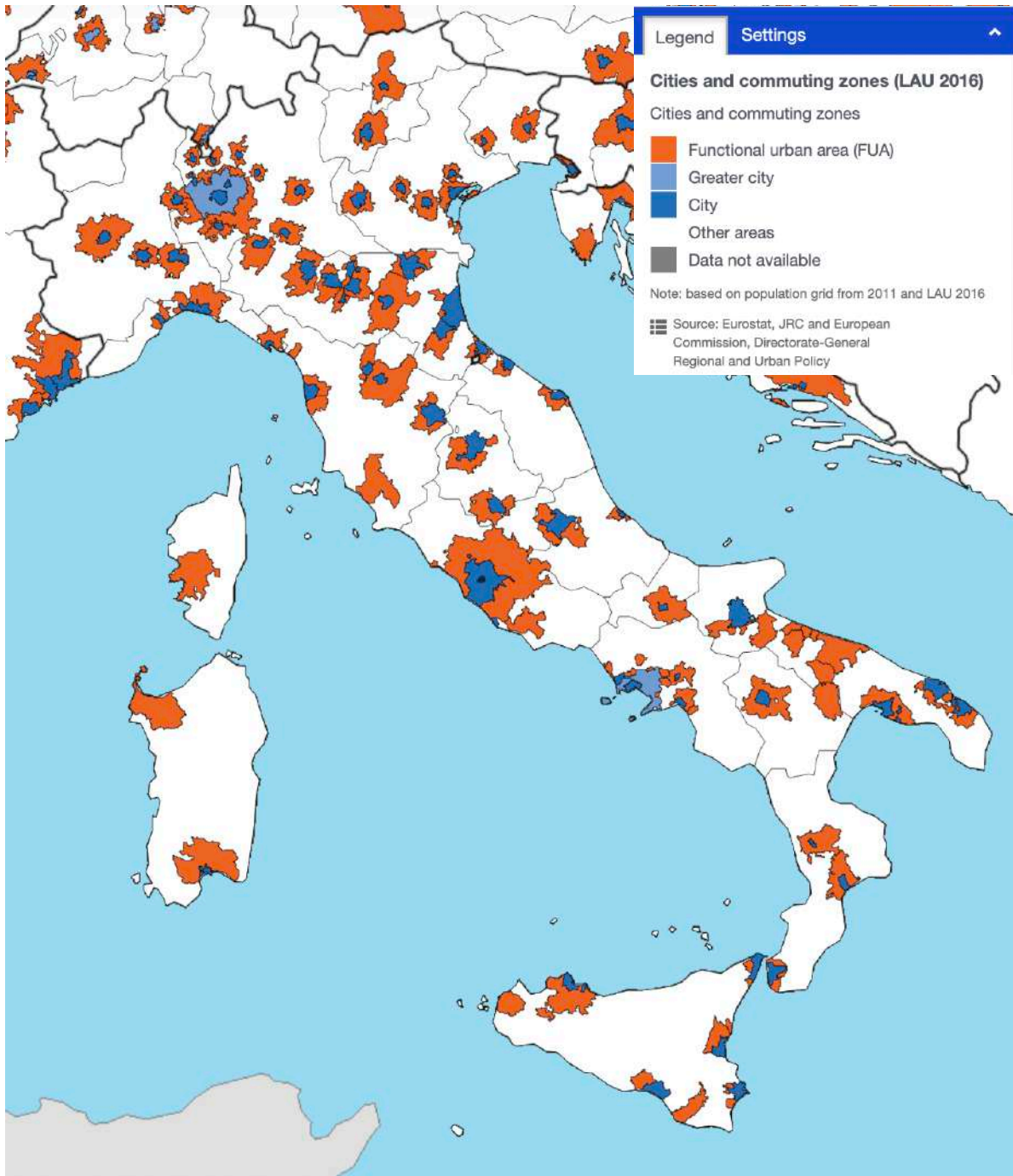
Map 24: Cities and commuting zones. Source: OECD (2016)
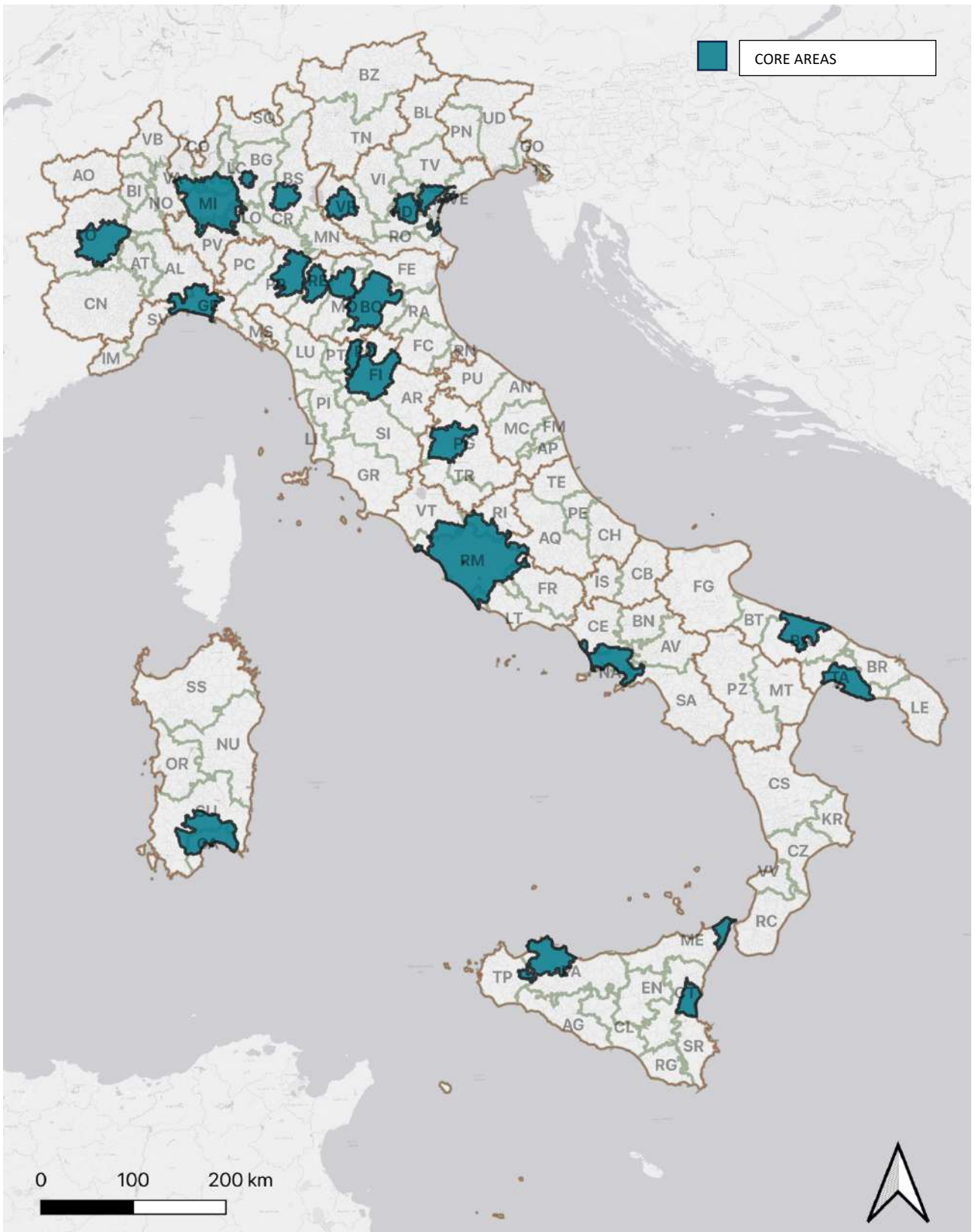
Map 25: Core areas "Functional urban areas > 250.000 inhabitants. Source: OECD, ISTAT

As it is possible to observe, intermediate areas according to this classification are concentrated in the Po Valley although with some differences. In the North-West area, selected as the case study, a near-total overlap with the intermediate areas is evident. Another large concentration of intermediate areas at the national level can be found along the coasts, especially on the Adriatic side. In the South, the distribution does not follow a specific pattern. An interesting observation arises: although intermediate areas are generally spread throughout the peninsula, in certain provinces, all municipalities—including the provincial capital—are classified as intermediate. This could provide valuable insights from an analytical standpoint, shedding light on the distinct characteristics and particularities of these provinces today. From north to south, the provinces of Biella, Novara, Treviso, Gorizia, Trieste, Ravenna, Terni, Ascoli Piceno, and Ragusa are fully categorized as intermediate.

Other provinces are characterized by the presence of intermediate areas throughout almost the entire province. For example, in Asti and Alessandria, only the southern Apennine foothills at the border with Liguria are classified as 'inner.' This same area also overlaps with the border of the province of Cuneo, which is largely intermediate as well, except for this area and the Alpine zone marked by the Maritime Alps along the border with France. This strip also affects the province of Imperia, which is otherwise characterized by intermediate municipalities. As for the rest of Liguria, the province of Savona is completely characterized by intermediate municipalities, except for the Apennine municipalities at the border with the province of Cuneo. The province of La Spezia has similar intermediate characteristics, with the presence of some inner municipalities in the Apennines along the border with the province of Parma. The Genoa area is characterized by multiple scenarios where core and inner areas border and overlap, in addition to intermediate municipalities in Tigullio area towards the east. Small Alpine and inner offshoots can also be found in the northern part of the provinces of Verbania and Lecco, the latter characterized in the south by some municipalities connected to the Milan functional area.

Moving down to the plains, the province of Cremona is almost entirely characterized by intermediate municipalities, except for the northern extension of the Milan functional area. The same applies to the province of Pavia, also characterized by some inner municipalities in the Oltrepò Pavese hills in the southeast, bordering the provinces of Piacenza, Genoa, and Alessandria, near the so-called "Four Provinces" area. Lastly, the province of Mantua is almost entirely characterized by intermediate municipalities, except for a small group of inner municipalities to the east, near the border with the province of Modena.

In the North-East, the largely intermediate character of the provinces of Vicenza and Rovigo stands out, both characterized by also the presence of inner municipalities, in the first case at the mountain border with the province of Trento and, in the second, near the mouth of the Po River. This last feature also characterizes the province of Ferrara. Also, in the North-East, the province of Pordenone is largely intermediate, except for the Alpine areas in the north. The Emilian provinces (Parma, Reggio Emilia, Modena, and Bologna) are characterized by a composite scenario in which a good part of the territory has a predominantly central character, while the Apennine areas are characterized by the presence of inner municipalities.

In Tuscany, the situation is varied: the provinces of Lucca, Massa Carrara, Pisa, Livorno, Grosseto, Siena, and Arezzo feature both inner and intermediate areas, while the provinces of Prato and Florence are mostly core. Along the Adriatic coast, as mentioned earlier, the provinces of Forlì-Cesena, Rimini, Pesaro-Urbino, Ancona, Macerata, Fermo, Teramo, Pescara, and Chieti follow a similar pattern, with a majority of intermediate municipalities along the coast, followed by inner municipalities as one moves toward the Apennine ridge.

As for Umbria and Lazio, it can be noted that the province of Perugia presents a coexistence of inner, intermediate, and core areas, while the provinces of Viterbo, Rieti, Frosinone, and Latina are largely characterized by intermediate municipalities, with some inner municipalities. A different situation applies to the Rome area, characterized by the strong presence of core areas. The same applies to Campania, where the core area of Naples entirely covers the province, with some municipalities in the provinces of Salerno and Caserta. The provinces of Caserta and Benevento are mostly characterized by intermediate municipalities, while in the provinces of Salerno and Avellino, the presence of intermediate areas is juxtaposed with inner areas.

Moreover, the provinces of Matera and Isernia have a predominantly inner nature. The province of Campobasso presents a coexistence of intermediate and inner municipalities, as does the province of Potenza, although the latter is mostly characterized by the presence of inner ones. Looking at Puglia, the provinces of Brindisi and Barletta-Andria-Trani are largely characterized by intermediate areas, while in the other provinces, such as Foggia, the presence of coastal and inner Apennine municipalities is noted, as well as in the "heel" of Italy, in the province of Lecce. The provinces of Bari and Taranto, however, are characterized by the coexistence of core, inner, and intermediate scenarios.

All the provinces of Calabria are characterized by the presence of both intermediate and inner areas, with a predominance of intermediate areas in the province of Vibo Valentia. In Sicily, the situation is more varied: core areas characterize the provinces of Catania, Messina, and especially Palermo, in a provincial framework where these are accompanied by intermediate and inner areas. As mentioned

earlier, the province of Ragusa is characterized by the presence of inner areas as a whole, and this presence is widespread in the provinces of Siracusa and Trapani as well. The provinces of Enna and Caltanissetta are largely characterized by inner areas, while the province of Agrigento shows an almost equal distribution of both inner and intermediate scenarios.

Finally, in Sardinia, the core area covers almost the entire province of Cagliari and extends beyond the border into the province of South Sardinia. The latter is characterized by the coexistence of all three scenarios. The provinces of Oristano and Sassari are largely characterized by intermediate municipalities alongside inner ones, while the province of Nuoro is almost entirely characterized by inner municipalities.
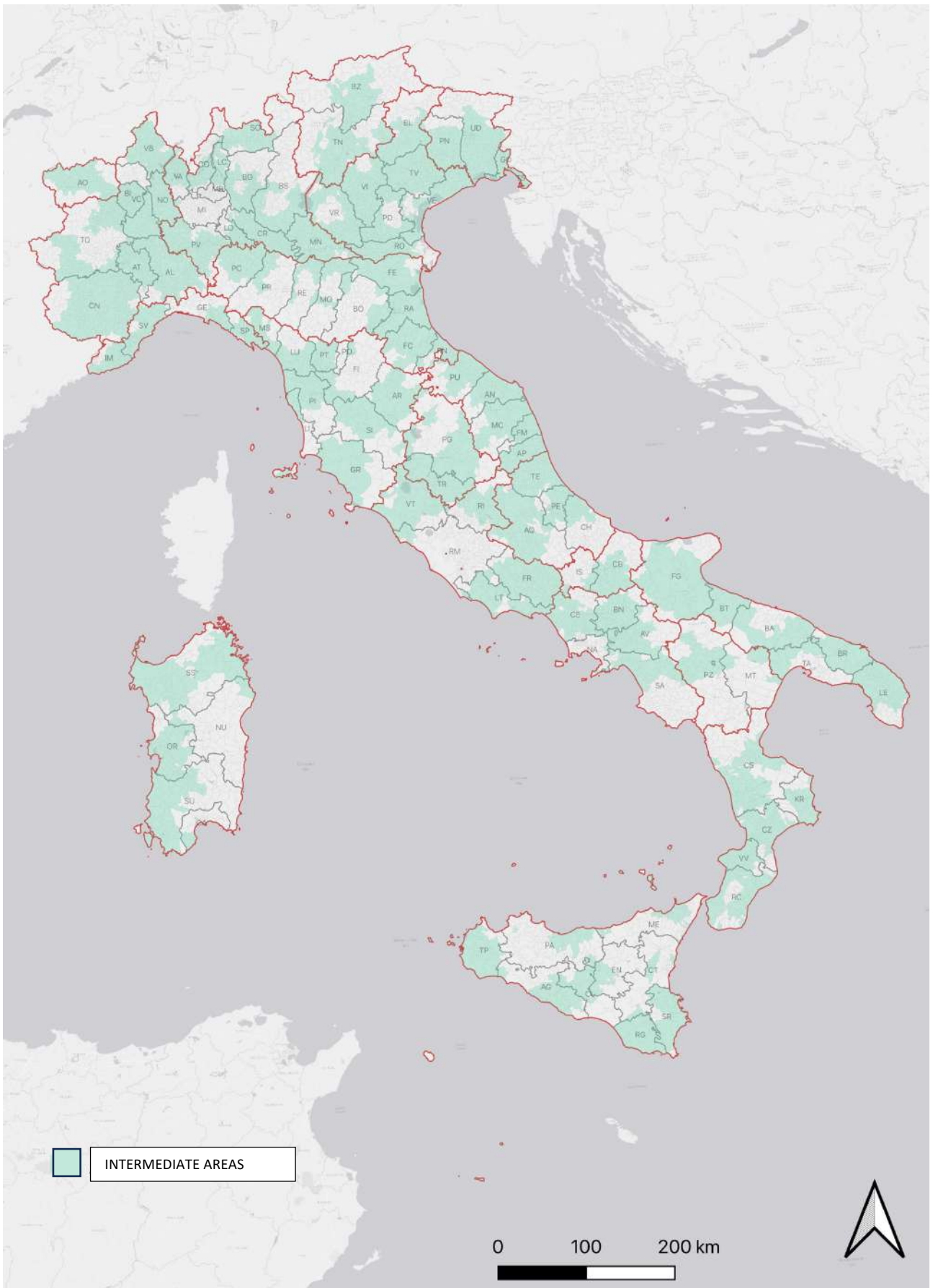
Map 26: Intermediate areas. Author's elaboration on SNAI, ISTAT, OECD data

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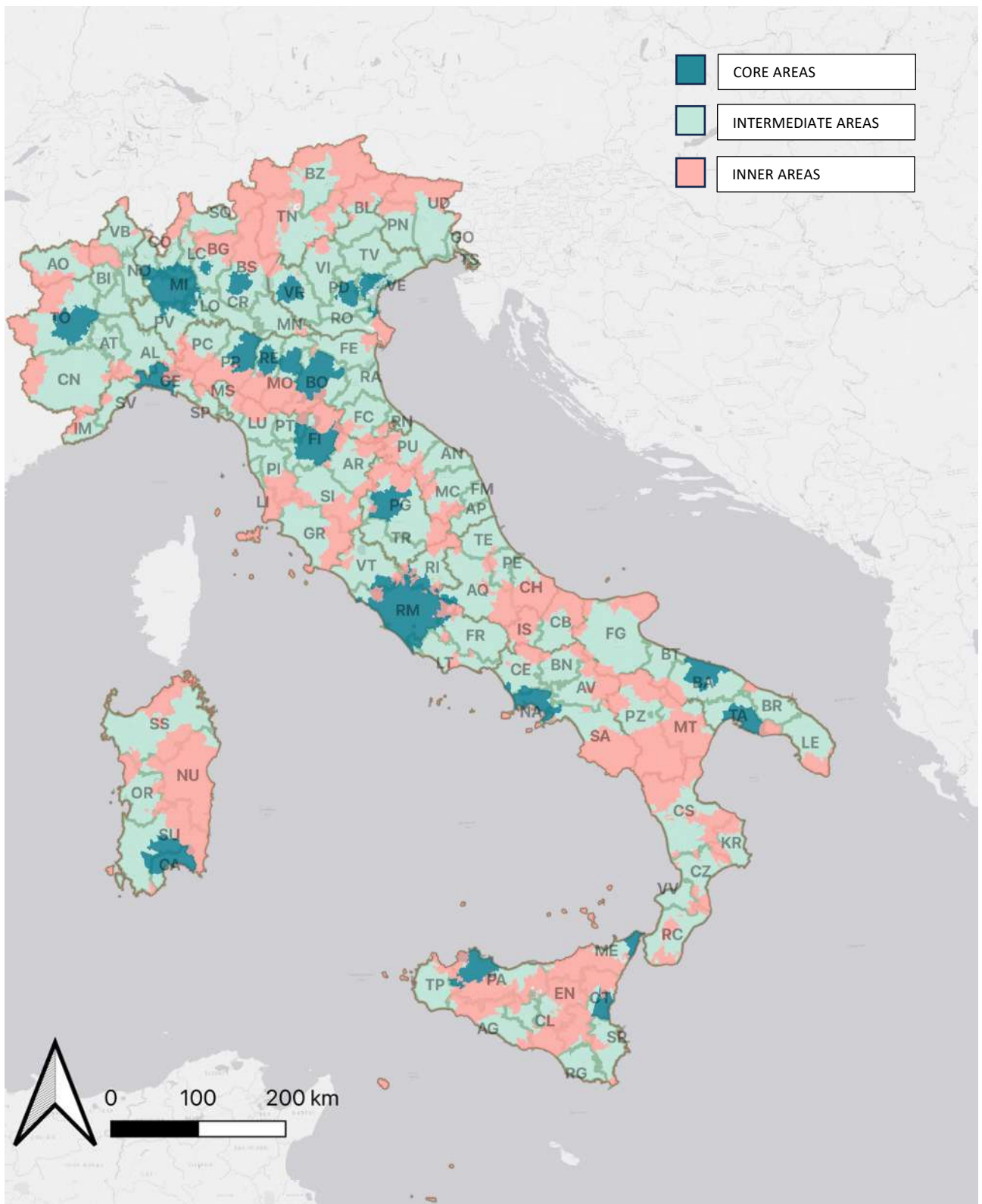
Map 27: National classification of core, intermediate and inner areas. Authors elaboration on SNAI, OECD, ISTAT data
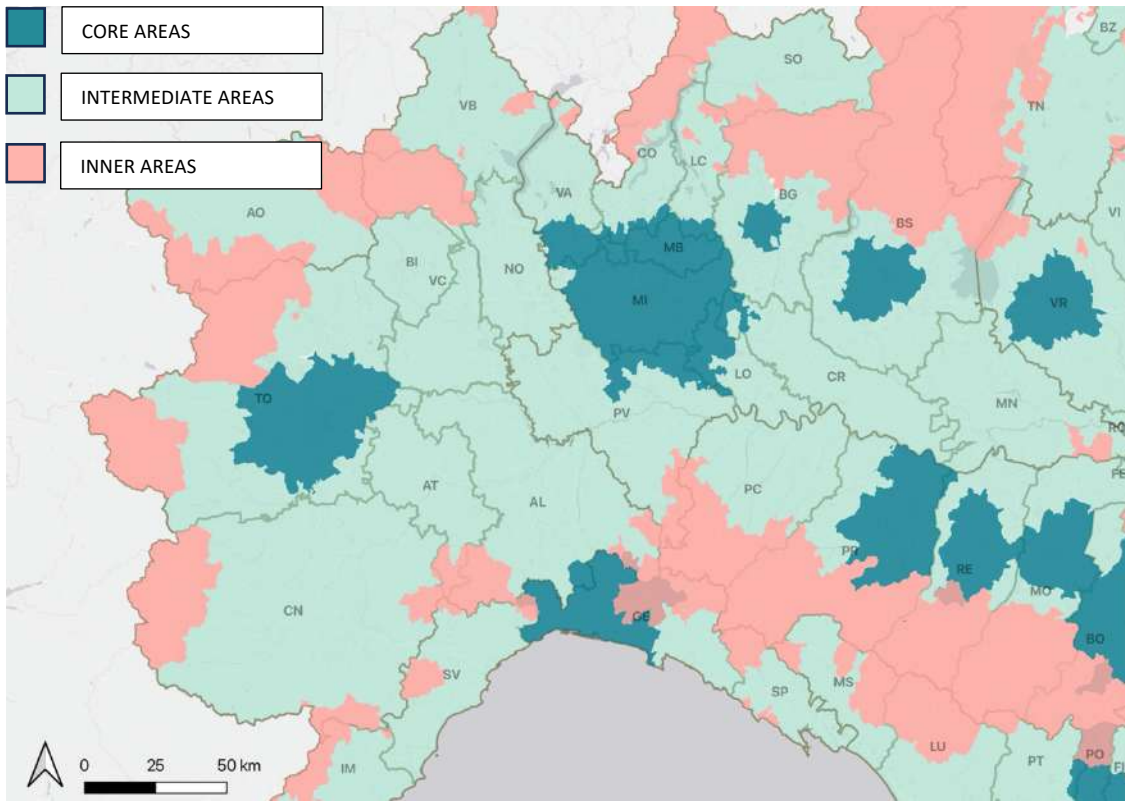
Map 28: Classification of core, intermediate and inner areas. Northwest Italy focus. Authors elaboration on SNAI, OECD, ISTAT data
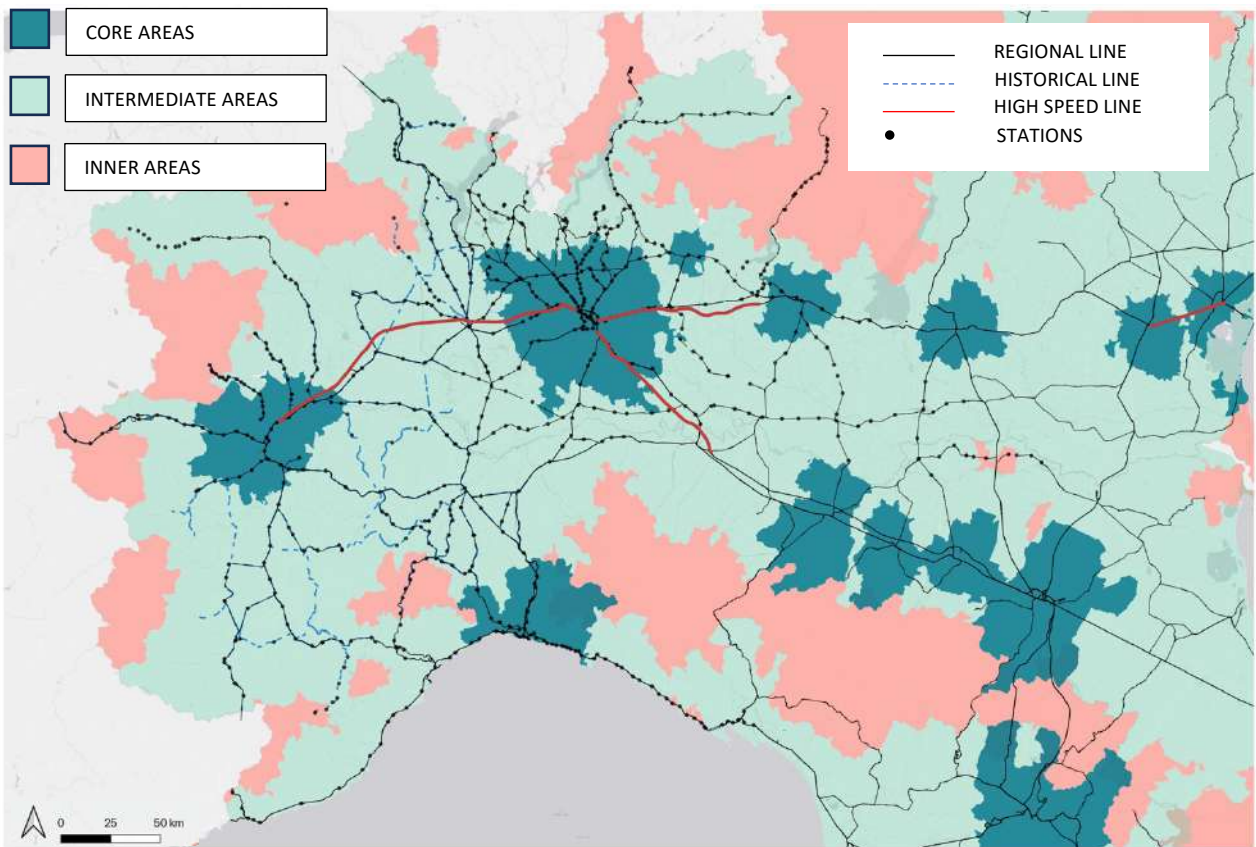
Map 29: Classification of core, intermediate and inner areas with railway line and stations. Northwest Italy focus. Authors elaboration on SNAI, OECD, ISTAT data

This paragraph builds on Chapter 3.5, which presented the literature on the definitions of intermediate areas and the contemporary dynamics that characterize them. Drawing on relevant literature and reports, Chapter 3.5 provided an overview of the ongoing dynamics in intermediate areas at the national level from various perspectives, such as demographic, economic, sustainability, and the availability of services and functions.

Chapter 3.4, meanwhile, explored the different approaches to mapping the national territory according to various investigative lenses, with a particular focus on tourism, which will be revisited here. Finally, Chapter 3.6 offered an overview of the challenges related to accessibility and mobility specifically within intermediate areas. Some elements from these chapters, along with other previously unexamined indicators, will be reconsidered in this and the following paragraphs.

The literature consulted has considered how this evolving framework translates into potential processes of territorial marginalization and, more broadly, new territorial challenges. The conclusions of this chapter will attempt to offer some exploratory insights into these issues.

After outlining the boundaries of the intermediate areas and identifying the taxonomy between central, intermediate, and inner areas (5.2.1), this paragraph will describe the dynamics of the North-West through the different types identified. These dynamics have been analyzed using indicators related to population structure and trends, as well as economic, environmental, functional, and cultural characteristics, along with mobility and accessibility indicators (Tab 5).

The decision was made to investigate the differences between core areas, intermediate areas, and inner areas both within the North-West macro-area and subsequently in the regional contexts that comprise it. The North-West division (1) is, in fact, one of the five macro-areas into which ISTAT divides the Italian territory, commonly used for statistics and data collection. The unit of measurement used was the municipal level, allowing for further elaborations from the same dataset at more detailed scales, such as by province or based on other aggregations proposed in the literature.

Additionally, some adjustments to the dataset were necessary during the data analysis. Specifically, municipalities with over 250,000 inhabitants were excluded, namely Genoa, Turin, and Milan. Although this decision may present certain limitations, particularly in terms of approach, it allowed for more homogeneous data, despite some constraints, which will be discussed case by case.

However, this exercise aimed to further decentralize the focus from the dynamics of major Italian cities, shifting attention to less-studied areas.

For this reason, it was decided to refer to the more "central" areas of the classification as the "core basin", a term that, while not commonly used, could be useful in the proposed classification to avoid overlaps with more frequent terms in the literature already discussed in this work. The following tables provide an overview of the distribution of core, intermediate, and inner municipalities by region (Table 17) and by province (Table 18).

	PIEMONTE		VDA		LOMBARDIA		LIGURIA		Total	
CORE BASIN	92	7,80%			368	24%	28	12%	488	16%
INTERMEDIATE	957	81,10%	61	82,43%	912	61%	169	73%	2099	70%
INNER	131	11,10%	13	17,57%	225	15%	36	15%	405	14%
Total	1180	100%	74	100%	1505	100%	233	100%	2992	100%

Table 17: Classification by region. Elaboration of the author

Provincia	CORE BASIN		INTERMEDIATE		INNER		Total
Torino	89	28,62%	184	59,16%	38	12,22%	311
Vercelli	1	1,22%	56	68,29%	25	30,49%	82
Novara			87	100,00%			87
Cuneo			216	87,45%	31	12,55%	247
Asti			108	91,53%	10	8,47%	118
Alessandria	2	1,07%	164	87,70%	21	11,23%	187
Aosta			61	82,43%	13	17,57%	74
Imperia			56	84,85%	10	15,15%	66
Savona			63	91,30%	6	8,70%	69
Genova	28	42,42%	23	34,85%	15	22,73%	66
La Spezia			27	84,38%	5	15,63%	32
Varese	30	21,74%	104	75,36%	4	2,90%	138
Como	17	11,49%	94	63,51%	37	25,00%	148
Sondrio			50	64,94%	27	35,06%	77
Milano	127	96,21%	5	3,79%			132
Bergamo	26	10,70%	151	62,14%	66	27,16%	243
Brescia	41	20,00%	91	44,39%	73	35,61%	205
Pavia	27	14,52%	150	80,65%	9	4,84%	186
Cremona	9	7,96%	104	92,04%			113
Mantova			59	92,19%	5	7,81%	64
Biella			74	100,00%			74
Lecco	12	14,29%	68	80,95%	4	4,76%	84
Lodi	24	40,00%	36	60,00%			60
VCO			68	91,89%	6	8,11%	74
Monza e Brianza	55	100,00%					55
Totale complessivo	**488**	16,31%	**2099**	70,15%	**405**	13,54%	**2992**

Table 18: Classification by province. Elaboration of the author

a) Data Sources and Indicators

The profile of the different core, intermediate, and inner contexts is outlined by integrating various data sources at the municipal level. Demographic and economic data come from the 2021 ISTAT census. Real estate data, on the other hand, are derived from OMI quotations provided by the Italian Revenue Agency for the year 2019. OMI zones are defined as sub-municipal homogeneous territorial areas with a minimum/maximum range, in euros per square meter, of market and rental values, categorized by property type and condition. To obtain an average value for each municipality, an initial data processing was carried out using GIS software.

Additionally, the index of metropolitan function density (MF21) was derived from a synthesis of indicators across various dimensions: a demographic dimension, considering the number of inhabitants (ISTAT 2021); a productive dimension, based on the number of employees in manufacturing, tertiary, and public services sectors, obtained from the points of interest database (Geolytica 2021); and a territorial interdependence dimension, based on mobility flows derived from the analysis of the OD matrix from the census.

Environmental data were provided by ISPRA (Italian Institute for Environmental Protection and Research). Digital data (2020) were sourced from AGCOM (the Italian Communications Authority). Two particularly significant datasets were the Composite Municipal Fragility Index, developed by ISTAT in 2019, which includes numerous indicators of fragility used here (such as the Composite Municipal Fragility Index itself, the Accessibility to Essential Services Index, the percentage of the population aged 25-64 with no more than a lower secondary school diploma or vocational qualification, employment rate for those aged 20-64, and population growth rate), and the dataset provided by ISTAT (2022) on municipal accessibility to major transport infrastructure, which maps access times to key infrastructure and related accessibility indexes. Mobility data from the 2021 census on systematic mobility (within and outside the municipality) were also taken into account.

Finally, regarding tourism data, the Classification of Municipalities based on Tourism Density (ISTAT 2020) was used.

The following table presents the summary data (Table 19), and the following pages provide a portrait of the main ongoing dynamics by dimension (Table 20). For a clearer visualization please click:

https://drive.google.com/drive/u/2/folders/1ZLmg8dCRLOi-NJ4juRY_Z48jUexR_3PX

Dimensions	Variable Code	Indicators	YEAR	Source
ID	COD_RIP	Geographic division code	2021	ISTAT
	COD_REG	Region code	2021	ISTAT
	COD_PROV	Province code	2021	ISTAT
	COD_CM	Metropolitan city code	2021	ISTAT
	KMQ_21	Administrative unit area in kmq	2021	ISTAT
	COD_UTS	Code of the intermediate territorial unit between the Municipality and the Region, valid for statistical purposes: province, metropolitan city, municipalities	2021	ISTAT
	PRO_COM	Concatenated province and municipality code (numeric)	2021	ISTAT
	PRO_COM_T	Concatenated province and municipality code (text)	2021	ISTAT
	COMUNE	Municipality name label (in Italian)	2021	ISTAT
	CLASSIFICAZIONE	Classification result	2024	OECD, SNAI, ISTAT
	CC_UTS	Capital Municipality of the Supra-Municipal Territorial Unit	2021	ISTAT
DEMOGRAPHY	Perc1991_2001	Percentage variation of population 1991 - 2001	1991	ISTAT
	Perc2001_2011	Percentage variation of population 2001 - 2011	2001	ISTAT
	Perc2011_2021	Percentage variation of population 2011 - 2021	2011	ISTAT
	var pop 91_21	Population variation 1991 - 2021	1991 - 2021	ISTAT
	pop_21	Resident population in 2021	2021	ISTAT
	ETA_AVG_21	Average age per municipality	2021	ISTAT
	POP_DEPEN_INDEX_ADJ	Adjusted population dependency index	2021	ISTAT
	Bistr	Population aged 25 to 64 with education no higher than middle school diploma or vocational qualification	2021	ISTAT
	IncrP	Population growth rate	2021	ISTAT
	T_migr_21	Total migration rate	2021	ISTAT
	P_ST_21	% foreign residents	2021	ISTAT
	PERC_1C	% single-person households	2021	ISTAT

	Perc3_5	% households with 3 + 4 + 5 members	2021	ISTAT
REAL ESTATE	compr_avg_	Average real estate purchase prices	2019	ZONE OMI, AGENZIA DELLE ENTRATE
	loc_avg_19	Average real estate rental prices	2019	ZONE OMI, AGENZIA DELLE ENTRATE
ECONOMY	EMPL_RATE_20_64	Employment rate (20-64 years old)	2021	ISTAT
	Red_imp_av	Taxable income per taxpayer	2021	ISTAT
	P_inf10k_2	% taxpayers earning less than 10,000 euros	2021	ISTAT
ENVIRONMENT	FORMET5	Dispersion index	2021	ISPRA
	COMP_FRAG_INDEX_DECILE	Composite municipal fragility index - decile	2021	ISTAT
	var_0621	Change in percentage of land consumed between 2006 and 2021	2006 - 2021	ISPRA
SERVICES AND CENTRALITIES	MF21mean	Metropolitan functions density (average)	2021	Geolytica, ISTAT
	CLASSE COMUNI SNAI	DESCRIPTION_Inner_Areas 2021 - 2027	2020	ISTAT
	MAPPA_AI_4	Prevalent destination MUNICIPALITY (AI 2021-27)	2020	ISTAT
	San_2019_tot	Healthcare - care institutions - total public + private	2019	ISTAT ; Ministero della salute
	Sport_banc20	Banking services - municipal data - total bank branches	2020	ISTAT , Banca d'Italia
ACCESSIBILITY	Mot	High-emission motorization rate	2021	ISTAT ; ACI
	IASS	Accessibility index to essential services	2021	ISTAT su dati TOM TOM
	Tmin_S	Minimum travel time (COST-TO-CLOSEST, minutes) - Stations	2019	ISTAT
	Tmin_AS	Minimum travel time (COST-TO-CLOSEST, minutes) - Highways	2019	ISTAT
	IndAZ_S	Accessibility index (gravity model - Standardized Values) - Stations	2019	ISTAT
	IndAZ_AS	Accessibility index (gravity model - Standardized Values) - Highways	2019	ISTAT
MOBILITY	ALL	Systematic mobility, Total trips	2021	ISTAT
	FuoriComAL	Systematic mobility, Total trips within municipality	2021	ISTAT
	SameComALL	Systematic mobility, Total trips outside municipality	2021	ISTAT

	PercFuoriComAL	Percentage of total trips outside municipality	2022	ISTAT
	PercSameComALL	Percentage of total trips within municipality	2023	ISTAT
DIGITAL	SPEED_DOWN	Average of ADSL download speed	2020	AGCOM
CULTURAL	ISCR_UNI17	University enrollees - residence municipality	2017	ISTAT , MIUR
	Perc_iscr_UNI17	Percentage of university enrollees - residence municipality	2017	ISTAT , MIUR
	MUS_18_tot	Museums and similar institutions - municipalities_ sum	2018	ISTAT; MIBACT
	MUS_18_mun	Museums and similar institutions - presence percentage	2018	ISTAT; MIBACT
	Perc_UNI193417	Percentage enrolled in University among young people (19 - 34 y)	2017	ISTAT , MIUR
TOURISTIC	PERCnontour	PERCENTAGE OF NON-TOURISTIC MUNICIPALITIES OVER TOTAL	2020	ISTAT

Table 19: Codebook of the data analysis, indicators considered. Authors elaboration

DIMENSIONS	INDICATORS	CORE BASIN					INTERMEDIATE					INNER				
		TOTAL	PIEMONTE	VDA	LOMBARDIA	LIGURIA	TOTAL	PIEMONTE	VDA	LOMBARDIA	LIGURIA	TOTAL	PIEMONTE	VDA	LOMBARDIA	LIGURIA
DEMOGRAPHIC	Percentage variation of population 1991 - 2001	-1,51%	-2,77%		-3,83%	2,07%	-0,71%	0,30%		-3,33%	-3,58%	2,61%	5,34%	0,28%	-1,12%	5,95%
	Percentage variation of population 2001 - 2011	7,17%	9,53%		13,26%	-1,29%	6,49%	3,44%	10,13%	13,29%	-0,91%	-2,60%	-8,01%	1,04%	4,68%	-8,10%
	Percentage variation of population 2011 - 2021	-1,12%	0,05%		3,32%	-6,74%	-2,19%	-3,06%	-2,78%	0,12%	-3,05%	-6,12%	-8,01%	-1,98%	-3,80%	-10,68%
	Resident population in 2021	1783112	866363		4372674	110299	1814421,75	2465655	114335	3864659	813038	116259,25	75584	9025	355741	24687
	Population variation 1991 - 2021	4,35%	6,55%		12,54%	-6,04%	3,28%	0,58%	3,51%	9,37%	-0,33%	-6,25%	-10,86%	-0,68%	-0,42%	-13,03%
	Average age	45,52165815	46,83		44,87	49,82	47,8134043	48,90	46,44	46,33	50,16	50,27783176	52,23	47,92	48,67	54,10
	Adjusted population dependency index	70,25	74,82		68,42	79,40	74,30	77,00	70,64	70,78	79,36	78,35	79,54	69,36	76,39	89,44
	Population aged 25 to 64 with education no higher than middle school diploma or vocational qualification	32,41	32,17		32,63	30,25	38,01	38,16	38,29	38,35	35,28	39,38977778	38,44	31,85	40,74	37,13
	Total migration rate	2,91%	5,73%		2,38%	0,72%	3,51%	3,89%	2,54%	2,82%	5,42%	2,45%	2,79%	-1,32%	3,02%	-0,98%
	Foreign residents	7,85%	5,13%		8,78%	4,60%	8,19%	7,41%	4,98%	9,03%	9,22%	5,57%	6,04%	5,51%	4,97%	7,60%
	Single-person households	33,37%	33,52%		32,40%	45,62%	37,85%	39,56%	45,64%	34,04%	45,95%	49,02%	56,79%	54,25%	42,48%	59,74%
	Households with 3 + 4 + 5 members	36,05%	34,35%		37,26%	25,69%	32,09%	30,07%	27,37%	35,72%	25,64%	25,11%	19,26%	22,16%	30,09%	16,32%
ECONOMIC	Employment rate (20-64 years old)	73,89	72,59		74,49	70,39	70,55	70,82	72,79	70,98	65,85	68,38	69,30	68,80	68,42	64,58
	Taxable income per taxpayer	24.424,65 €	23.694,98 €		24.715,93 €	22.993,83 €	21.270,95 €	20.892,80 €	21.112,48 €	22.010,43 €	19.478,92 €	18.793,83 €	18.873,94 €	20.685,49 €	18.787,34 €	17.859,76 €
	Taxpayers earning less than 10,000 euros	19,84%	20,76%		19%	22%	23,88%	24%	24%	23%	29%	29,41%	29%	30%	29%	31%
REAL ESTATE	Real estate purchase prices	1.367,7 €	1.314,7 €		1.332,8 €	1.992,4 €	1.014,1 €	857,4 €	1.713,4 €	962,7 €	1.924,8 €	1.055,5 €	988,3 €	2.512,7 €	999,6 €	1.115,1 €
	Real estate rental prices	4,7 €	5,5 €		4,5 €	5,4 €	3,3 €	2,8 €	3,0 €	3,4 €	5,8 €	3,8 €	3,8 €	4,7 €	3,8 €	3,5 €
ENVIRONMENT	Dispersion index	71,32871952	83,38		66,54	94,67	91,2184199	94,82	95,91	86,74	93,33	96,75564368	96,80	99,13	96,12	99,73
	Composite municipal fragility index - decile	3,125	3,27		2,94	5,04	4,1867556	4,36	6,93	3,75	4,54	5,325925926	5,58	7,00	4,98	5,97
	Change in the percentage of land consumed between 2006 and 2021	5,66	5,42		6,04	1,45	4,30536	4,48	3,33	4,57	2,23	1,829059821	1,50	2,93	2,15	0,60
CENTRALITY AND SERVICES	Metropolitan functions density	0,42	0,25		0,49	0,09	0,09	0,05	0,03	0,14	0,06	0,02	0,01	0,01	0,04	0,01
	Healthcare - care institutions - total public + private	77	15		61	1	133	41	2	79	11	7	0	0	7	0
	Banking services - municipal data - total bank branches	4,08	2,54		4,66	1,54	1,75	1,34	1,03	2,17	2,13	0,79	0,33	0,85	1,09	0,50
ACCESSIBILITY	High-emission motorization rate	12,60	15,84		11,55	15,82	18,3095665	20,74	18,35	15,41	20,17	20,61703704	23,37	17,09	18,97	22,14
	Accessibility index to essential services	16,43	16,21		15,43	30,39	22,4773702	22,30	25,55	22,19	23,92	54,54074074	54,09	48,14	55,54	52,26
	Minimum travel time (COST-TO-CLOSEST, minutes) - Stations	18,17	24,39		16,10	24,85	30,8292355	31,63	70,61	29,75	17,75	59,17427902	58,09	85,89	61,11	41,40
	Minimum travel time (COST-TO-CLOSEST, minutes) - Highways	11,03	10,58		11,09	11,74	19,0594905	16,16	12,15	23,47	14,14	50,86898472	41,65	30,03	59,72	36,59
	Accessibility index (gravity model - Standardized Values) - Stations	12,08	6,28		14,19	3,45	2,42738941	1,64	0,02	3,03	4,47	0,180012857	0,27	0,00	0,08	0,56
	Accessibility index (gravity model - Standardized Values) - Highways	54,70	56,28		54,86	47,34	38,7731344	40,90	48,24	35,34	41,79	8,508940775	11,83	15,71	5,34	13,62
MOBILITY	Systematic mobility, Total trips	3054872	477570		2520022	57280	3876861	1292484	61685	2129920	392772	228045	34513	4374	178827	10331
	Systematic mobility, Total trips within the municipality	1029988	154886		856542	18560	1641762	580234	28102	819636	213790	90701	14545	3050	69380	3726
	Systematic mobility, Total trips outside the municipality	2024884	322684		1663480	38720	2235099	712250	33583	1310284	178982	137344	19968	1324	109447	6605
	Percentage of total trips outside the municipality	67,06%	67,57%		66,01%	67,60%	54,16%	55,11%	54,44%	61,52%	45,57%	53,32%	57,86%	30,27%	61,20%	63,93%
	Percentage of total trips within the municipality	32,94%	32,43%		33,99%	32,40%	45,84%	44,89%	45,56%	38,48%	54,43%	46,68%	42,14%	69,73%	38,80%	36,07%
DIGITAL	ADSL download speed	8,85	8,63		8,88	9,27	8,67	8,50	7,93	9,04	7,94	7,60	6,13	9,08	8,51	6,68
TOURISM	Percentage of non-touristic municipalities	17,2%	21,74%		27,17%	7,14%	74,37%	24,66%	0	31,25%	4,14%	8,45%	13,74%	0	17,33%	8,33%
CULTURAL	Percentage of enrolled in University among young people (19 - 34 y)	13,87%	16,59%		13,02%	16,07%	11,91%	12,16%	13,33%	11,28%	13,36%	10,11%	10,56%	11,35%	9,87%	9,55%
	Museums and similar institutions - municipalities_ sum	2663109	1328531		1265195	69383	7291526	2428213	768821	3431800	662692	589366	162055	64418	341220	21673
	Museums and similar institutions - presence percentage	26,58%	27,17%		24,18%	57,14%	32,06%	29,47%	73,77%	24,23%	73,53%	37,93%	38,93%	115,38%	33,33%	35,14%

Table 20: Results. Author elaboration on data ISTAT, ISPRA, AG. DELLE ENTRATE, AGCOM

b) Demographic dimension

First, looking at the demographic dimension, indicators related to the resident population in four intercensal periods (1991, 2001, 2011, 2021) and the variations between these periods were considered (tab. 5).

When examining the variation between the most distant periods (1991–2021), it can be observed that core basin areas show a substantial population increase in both Piedmont and Lombardy, while Liguria experienced a decline (-6.04%). Intermediate areas saw slight decreases in Piedmont and Liguria (-2.91% and -1.02%, respectively), while population growth occurred in the intermediate areas of both Aosta Valley (+3.51%) and especially Lombardy (+9.37%). The most significant demographic declines were recorded in the inner areas throughout the entire partition. The smallest decrease was in Aosta Valley, with only a -0.68% decline, meaning that, when combined with the growth in intermediate areas, the total population remained relatively stable between 1991 and 2021.

While Lombardy experienced a positive trend in both core basin and intermediate areas, the inner areas saw a slight demographic contraction (-0.68%) over the last 30 years. However, this figure is much lower when compared to the sharp declines seen in Piedmont (-10.86%) and Liguria (-13.07%).

As can be seen, the only common dynamic is the contraction of the inner areas across all regions, although the extent varies. Regarding intermediate areas, positive values were recorded in all regions except for Liguria, which saw a limited decline. Liguria, the region most affected by demographic contraction, shows that intermediate areas have resisted the demographic crisis better than others. It is also the region with the highest average age, across all categories, with the inner areas having an average age of 54—ten years higher than the core basin areas of Lombardy, the "youngest" in the partition.

In Piedmont and Liguria, intermediate areas tend to align more closely with the dynamics of the core basin areas, whereas in Lombardy, the increase in average age is consistent across all areas, rising by two years from the core basin areas (44), through the intermediate areas (46), to the inner areas (48).

The specific dynamics of the North-West, particularly those in the Ligurian and Piedmontese provinces, are clearly visible on Map 17, where these trends become even more apparent from a continental perspective. The dark blue axis running from the province of Genoa to Verbano-Cusio-Ossola places this macro-area in relation to other regions in Europe experiencing similar trends, such as former East Germany and northern Spain.

The following graphs (8–14) highlight the population variation between 1991 and 2021, both by classification and by region.
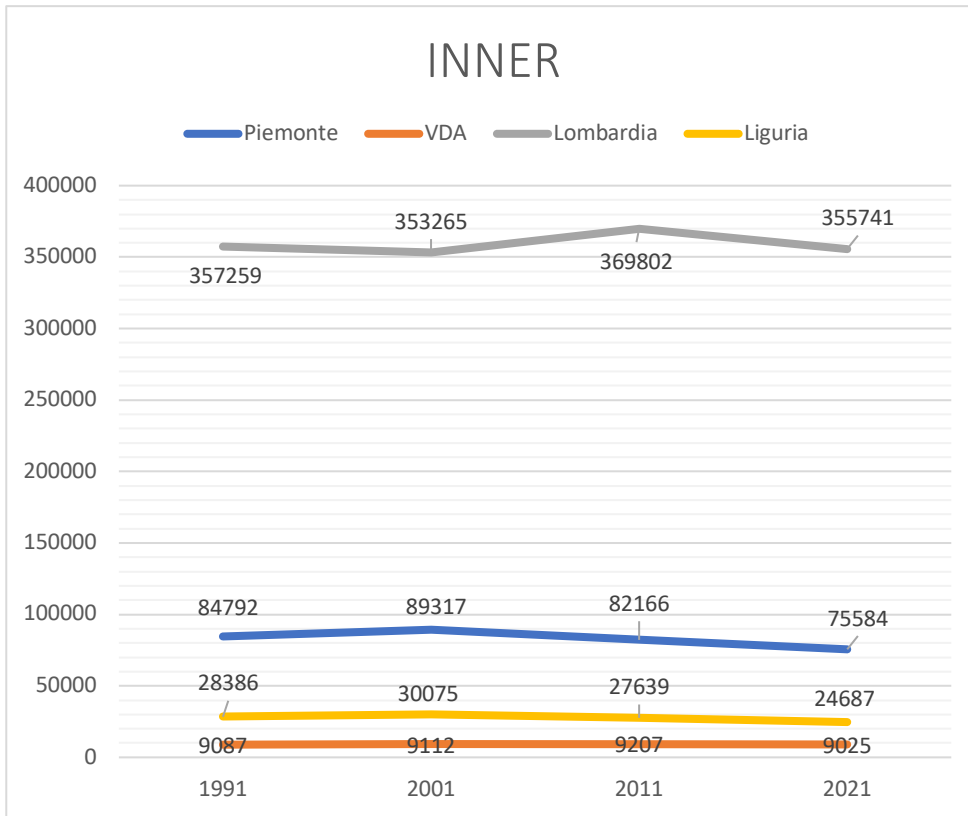
Graph 8: Population variety inner areas per regions (1991 – 2021) Source: ISTAT

INTERMEDIATE

Legend: Piemonte — VDA — Lombardia — Liguria

Lombardia: 3533571 (1991), 3407172 (2001), 3860034 (2011), 3864659 (2021)

Piemonte: 2451503 (1991), 2458805 (2001), 2543449 (2011), 2465655 (2021)

Liguria: 815701 (1991), 846275 (2001), 838601 (2011), 813038 (2021)

VDA: 110461 (1991), 106785 (2001), 117599 (2011), 114335 (2021)

X-axis: 1991, 2001, 2011, 2021
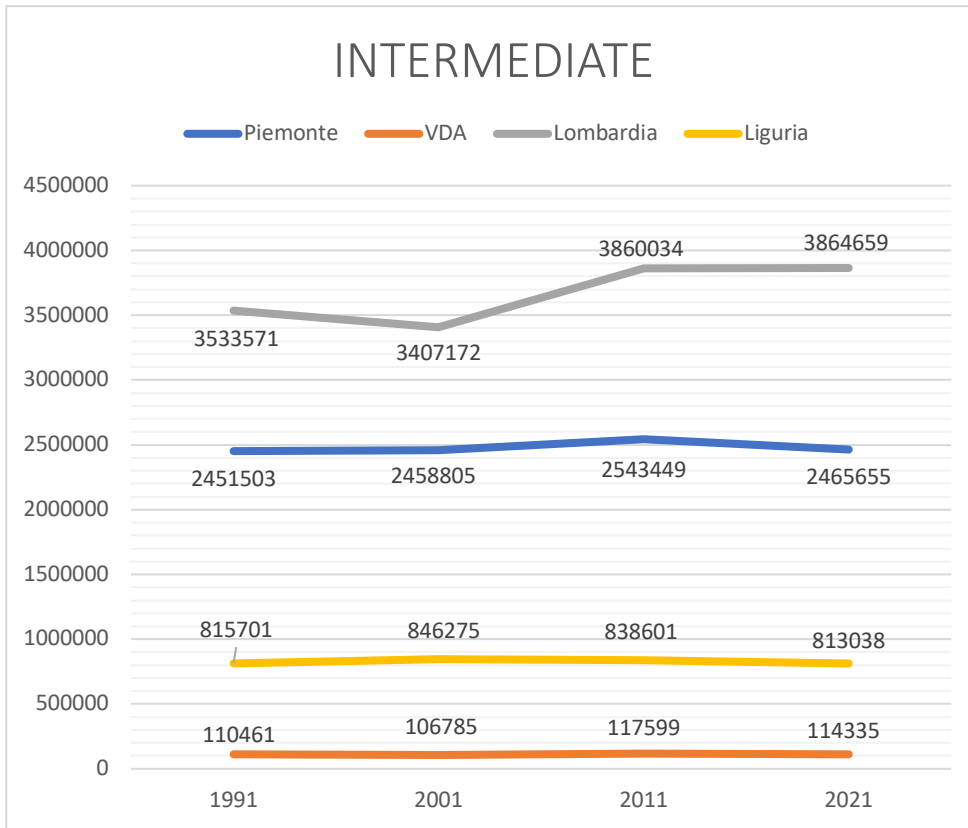
Graph 9: Population variety intermediate areas per regions (1991 – 2021) Source: ISTAT

CORE BASIN

Legend: Piemonte — Lombardia — Liguria

Lombardia: 3885513 (1991), 3736813 (2001), 4232192 (2011), 4372674 (2021)

Piemonte: 813119 (1991), 790574 (2001), 865934 (2011), 866363 (2021)

Liguria: 117389 (1991), 119819 (2001), 118274 (2011), 110299 (2021)

X-axis: 1991, 2001, 2011, 2021
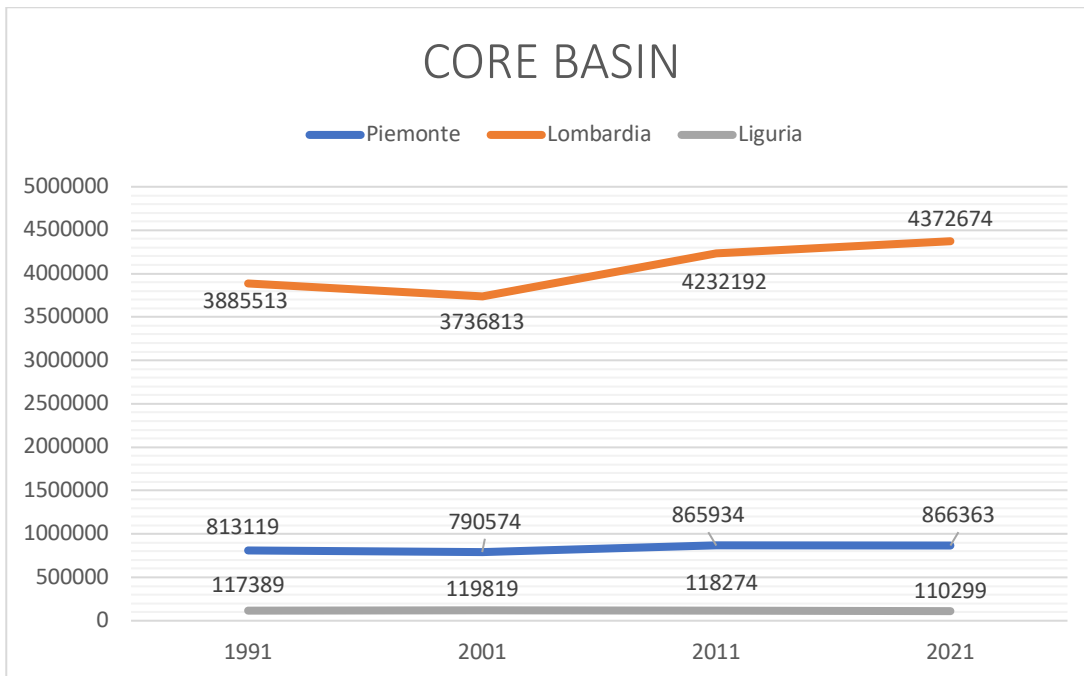
Graph 10: Population variety core basin areas per regions (1991 – 2021) Source: ISTAT
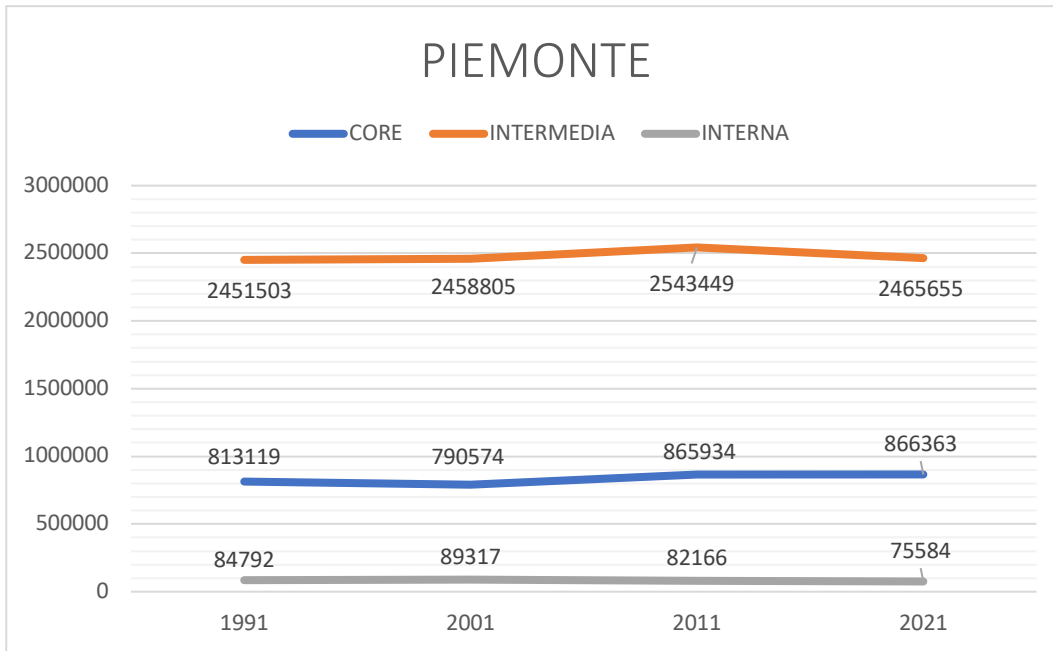
Graph 11: Population variety Piemonte per categories (1991 – 2021) Source: ISTAT
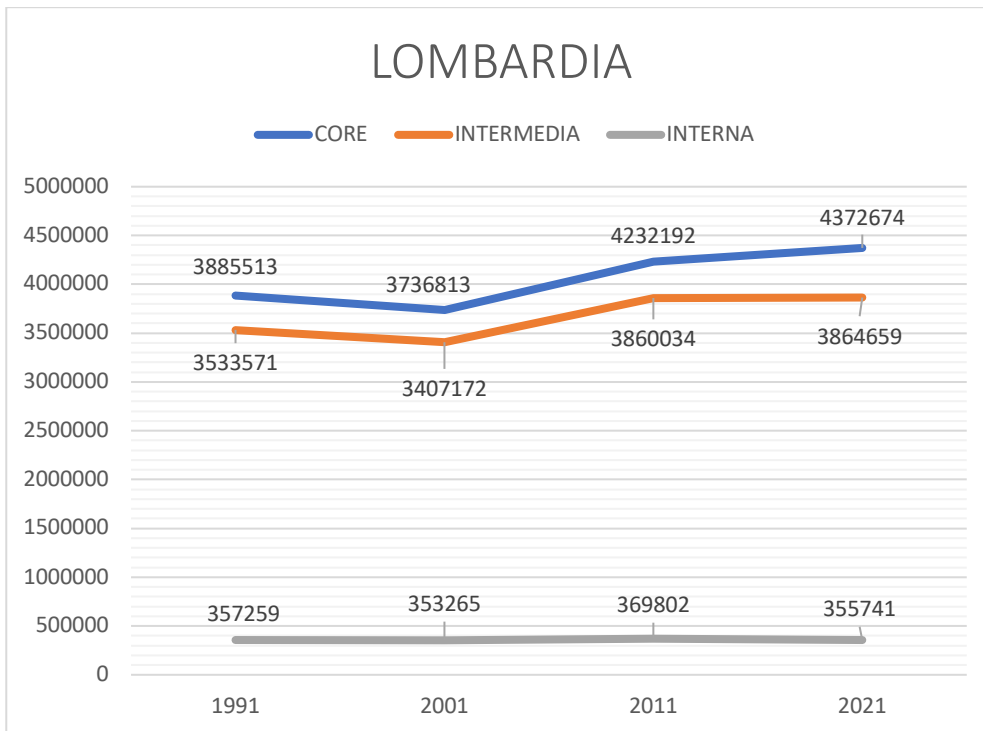
Graph 12: Population variety Lombardy per categories (1991 – 2021) Source: ISTAT
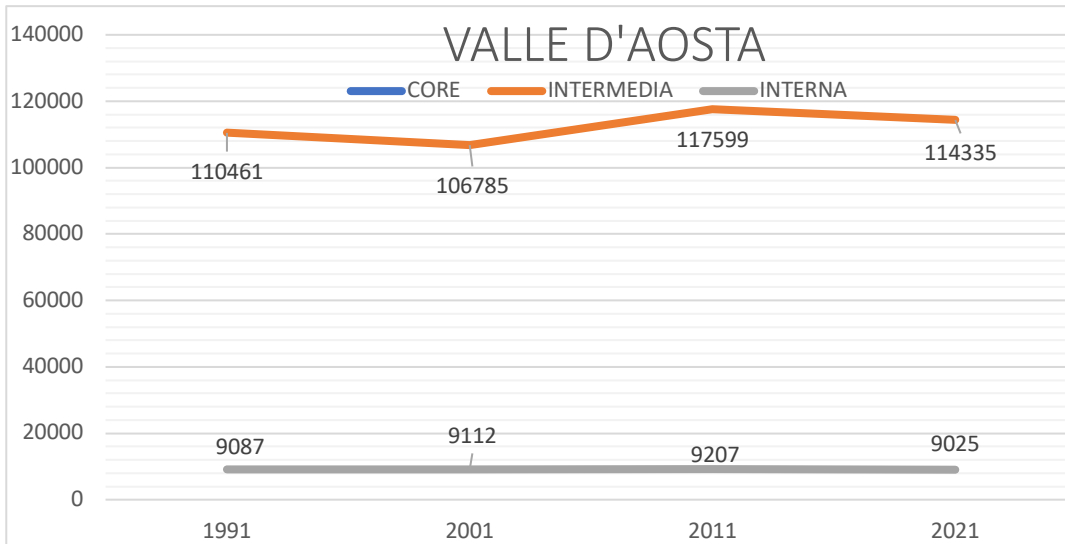
Graph 13: Population variety VDA per categories (1991 – 2021) Source: ISTAT
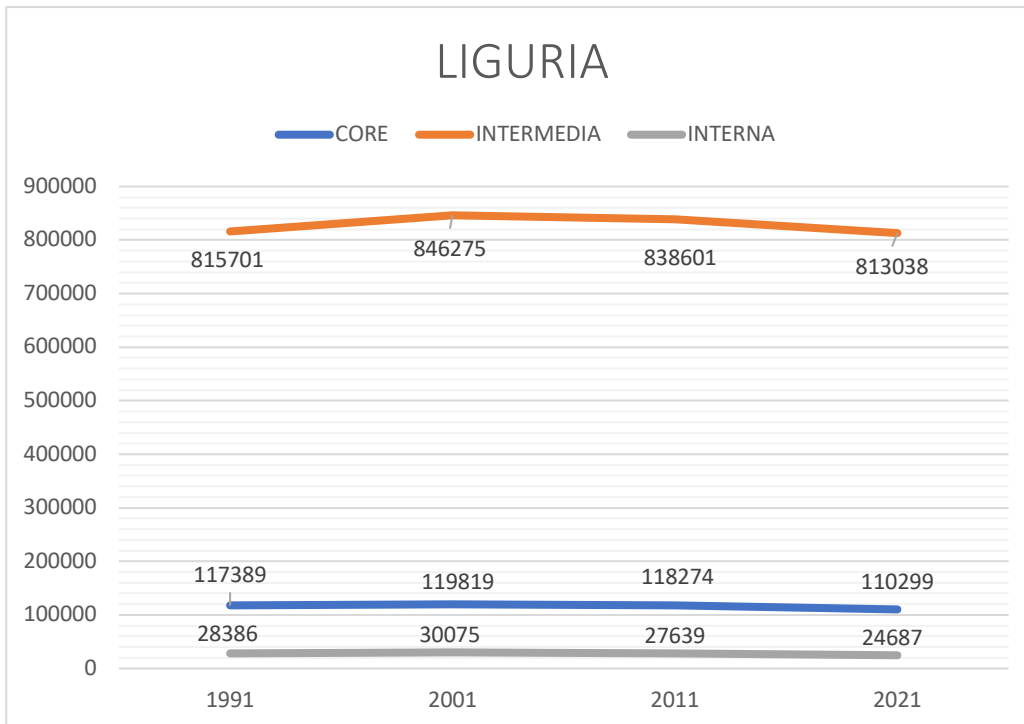
Graph 14: Population variety Liguria per categories (1991 – 2021) Source: ISTAT

Median age of the population, 1 January 2023

(years, by NUTS 3 regions)
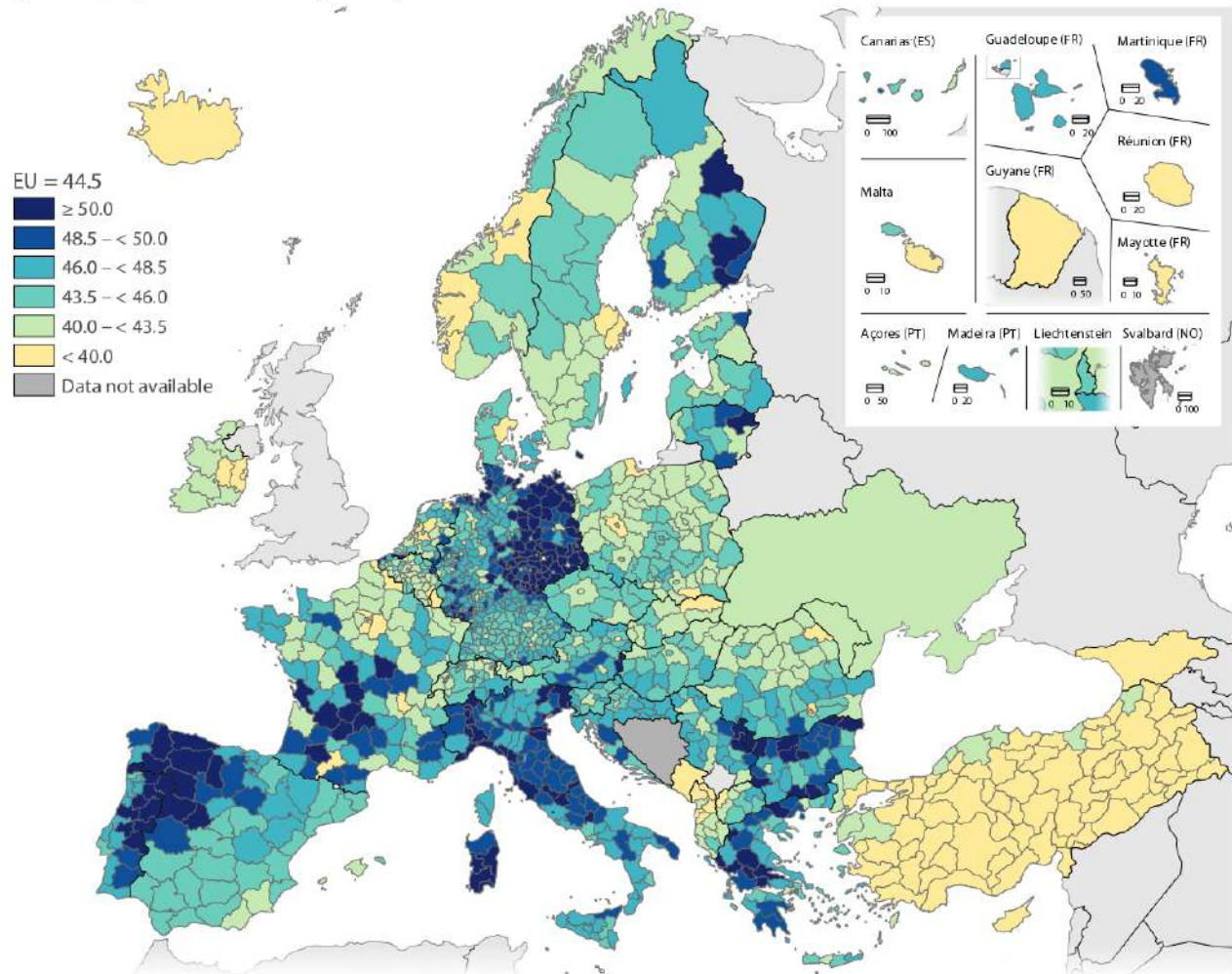
Map 30: Median age of the population. Source: Eurostat (2024)

Subsequently, the adjusted population dependency index (2021) is analyzed, as defined by ISTAT as the "percentage ratio between the younger population (ages 0-19) and the elderly population (ages 65 and over) relative to those aged 20-64. The total index corresponds to the sum of the youth and elderly dependency indices. This indicator measures the social burden on the population aged 20-64, determined by the younger and older age groups." High values of this indicator reflect increasingly aging societies, offering a more precise geographic understanding of the phenomenon. In line with overall population trends, the index is highest in inner areas, with Liguria recording particularly elevated values. At the regional level, the lowest values are found in Valle d'Aosta and Lombardy. For intermediate areas, the index lies between the values for core basin and inner areas.

Next, we consider the index measuring the population aged 25 to 64 with an education level no higher than a middle school diploma or vocational qualification (ISTAT 2021), which "assesses conditions of fragility determined by low educational attainment." In this case, the values for intermediate areas are closer to those of inner areas and are relatively consistent across regions. The lowest values are found in the inner areas of Valle d'Aosta (31.85%, compared to 38.44% in Piedmont, 40.74% in Lombardy, and 37.13% in Liguria). Overall, Liguria displays the lowest levels for this indicator.

These findings can be correlated with the percentage of university enrollments by municipality of residence, calculated for the population aged 19 to 34 (ISTAT 2017), which shows similar trends. Once again, intermediate areas exhibit values closer to those of inner areas. Core basin areas have a higher percentage, reflecting greater accessibility to higher education institutions, although regional differences persist (Piedmont and Liguria at 16.59% and 16.07%, respectively, compared to Lombardy at 13.02%).

As for the total migration rate, the data show positive values across the board, except for the inner areas of Liguria (-0.98), with no clear regional patterns emerging. In terms of classification, the highest values appear in intermediate areas (3.50), although there are no significant discrepancies compared to core basin areas (2.91) and inner areas (2.44). In all cases, the number of new residents registered for a change of residence exceeds those deregistered.

When analyzing the percentage of foreign residents, the highest percentages are found in intermediate areas (8.18%), slightly surpassing core basin areas (7.85%), while the percentage of foreign residents in inner areas is lower (5.5%). This could be linked to the productive character of these areas, as discussed in the theoretical framework (chapter 3.5), as well as the lower cost of living. Regionally,

the highest percentages are recorded in the intermediate areas of Lombardy (9.03%) and Liguria (9.22%), and in the core basin areas of Lombardy (8.78%).

Regarding household composition, analyzing the percentage of single-person households reveals that core basin and intermediate areas show similar patterns (33.37% and 37.85%, respectively), compared to inner areas where the proportion of single-person households is significantly higher (49.02%). The regional breakdown mirrors these trends, with much higher percentages observed in the inner areas of Liguria (59.75%) and Piedmont (56.79%). In the latter case, the gap between core basin areas (33.52%) and inner areas (56.79%) is wider than in the other regions analyzed. The high proportion of single-person households in inner areas is primarily due to the significant aging of the population.

In contrast, households with 3 to 5 members are more prevalent in core basin areas (36.05%) and less common in inner areas (25.11%), with intermediate areas serving as a middle ground (32.09%). Regionally, the highest percentage is found in the core basin areas of Lombardy (37.72%) and the lowest in the inner areas of Liguria (16.32%). Notably, the percentages in both the core basin and intermediate areas of Lombardy (37.26% and 35.72%) exceed the highest values in Piedmont (core basin areas at 34.35%).

c) Economic Dynamics

Moving on to the analysis of economic dynamics, the following indicators were considered: employment rate (ages 20-64), taxable income per taxpayer, and the percentage of taxpayers earning less than €10,000.

Regarding employment dynamics, there are no significant differences: the rate is slightly higher, as expected, in core basin areas (73.89) compared to intermediate areas (70.54) and inner areas (68.37). The regional data reflect a similar trend, although in Piedmont and Liguria, the figures for intermediate and inner areas are closer to each other than to those for core basin areas (Liguria: 65.85 and 64.58; Piedmont: 70.82 and 69.30).

As for income, a similar pattern emerges, with values gradually increasing from inner areas to core basin areas (inner areas: €18,793, core basin areas: €24,424), though the cost of living varies significantly. Looking at the regional data, the same trend is observed, with the highest values found in the core basin areas of Lombardy (€24,715) and Piedmont (€23,694).

Finally, when considering the percentage of taxpayers earning less than €10,000, a significantly higher proportion is found in inner areas (29.41%) compared to core basin areas (19.83%). Among the regions examined, the highest percentages are recorded in the inner areas of Liguria (31.22%) and Valle d'Aosta (30.06%). Intermediate areas exhibit different behaviors based on the region: in Piedmont and Lombardy, core basin and intermediate areas show similar profiles, whereas in Liguria, the data for intermediate areas are more aligned with those of inner areas.

D) Real Estate Dynamics

Looking at real estate data, the differences between the areas appear to be less pronounced than expected. However, rental values in intermediate areas are lower than in inner areas and, clearly, lower than in core basin areas. This may be due to the touristic attractiveness of inner areas, which drives up real estate values. In terms of property sales, the values in inner and intermediate areas are similar, while core basin areas are more expensive, albeit not substantially so.

Focusing on regional dynamics, certain elements help contextualize the data presented: for instance, the highest rental and sale values in inner areas are found in Valle d'Aosta, due to the strong tourism attraction of these regions (€4.71/m² for rentals and €2,512/m² for sales). High values are also recorded in Liguria, both in core basin areas (€5.44/m² for rentals and €1,992/m² for sales) and intermediate areas (€5.79/m² for rentals and €1,924.81/m² for sales). This likely reflects the distribution of tourist municipalities within these categories. The real estate values in Liguria's inner areas are considerably lower (€3.54/m² for rentals and €1,115.14/m² for sales), with rental values lower than those in Piedmont (€3.81/m²) and Lombardy (€3.85/m²), although sale values are higher (Piedmont at €988.27/m² and Lombardy at €999.56/m²).

An additional interesting detail regarding intermediate areas in Piedmont and Lombardy is that these are the most affordable in both rental and sales prices when compared to the other categories. However, these data should be analyzed more closely at the municipal level, as there are significant variations (see maps 11, 12). It is also important to note that core basin areas do not include the municipalities of Milan, Turin, or Genoa, which would likely have widened the gap in values compared to the other territorial categories.
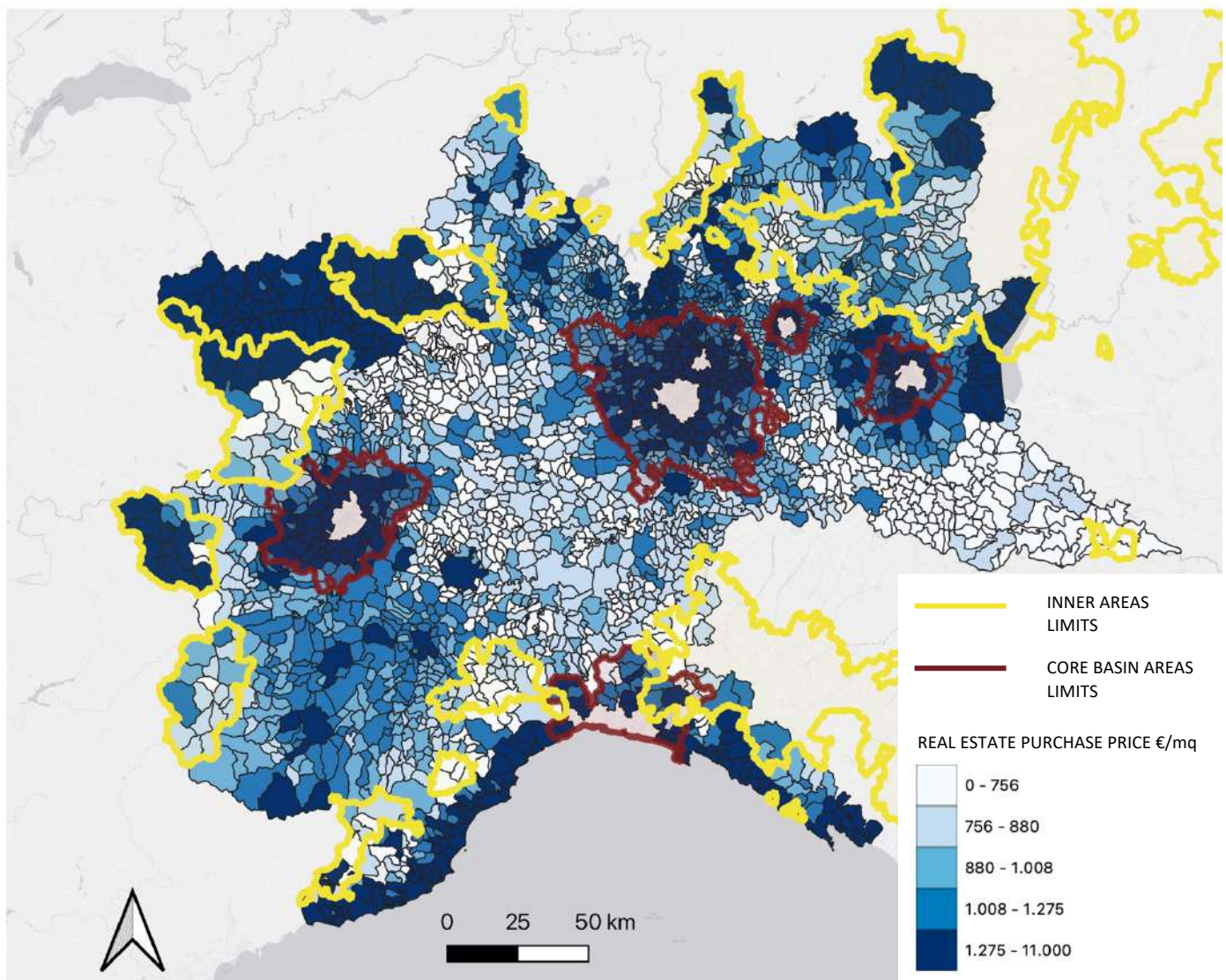
Map 31: Real estate purchase prices (2019). Author elaboration on Agenzia delle Entrate, ISTAT, OECD data
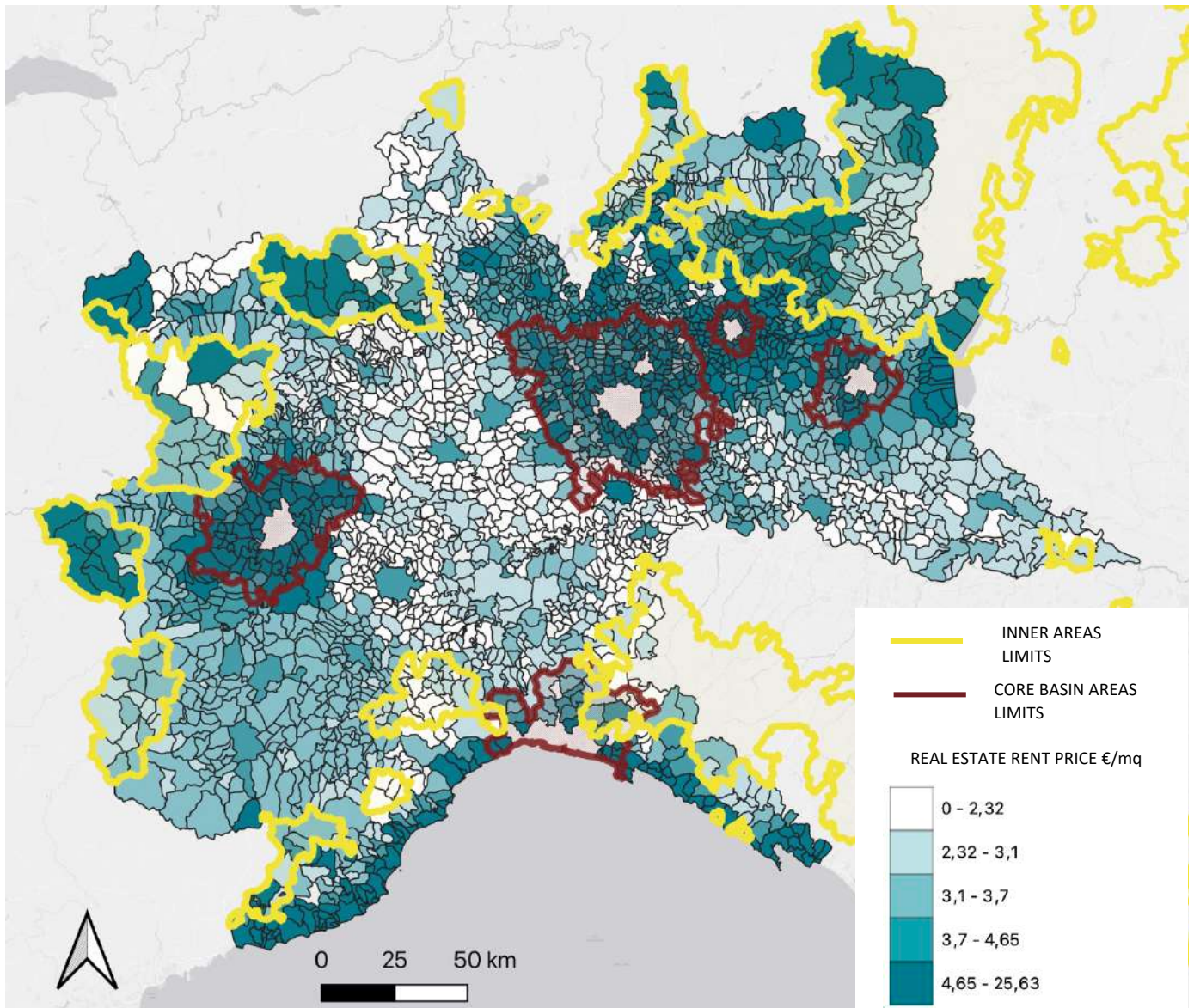
Map 32: Real estate rent prices (2019). Author elaboration on Agenzia delle Entrate, ISTAT, OECD data

e) Tourism Dynamics

In analyzing the aforementioned tourism indicators, the study also explored the distribution of non-tourist municipalities by category and region, using the dataset "Municipalities by Tourism Categories" (ISTAT 2020). Notably, the majority of non-tourist municipalities are concentrated in intermediate areas (74.37%), while the smallest proportion is found in inner areas (8.45%), which are thus distinguished by a strong tourism focus, as anticipated by the higher real estate values observed.

At the regional level, it is interesting to note that Valle d'Aosta does not have any non-tourist municipalities according to the classification used. As expected, Liguria displays low percentages of non-tourist municipalities across all categories: 8.33% in inner areas, 4.14% in intermediate areas, and 7.14% in core basin areas, all of which are significantly lower compared to Piedmont and Lombardy. In Piedmont, 24.66% of intermediate areas are non-touristic, followed by 21.74% in core basin areas and 13.74% in inner areas. In Lombardy, intermediate areas show the lowest tourism focus, with 31.25% classified as non-touristic, followed by 27.17% in core basin areas and 17.33% in inner areas.

f) Environmental Dynamics

Turning to the environmental dimension, previous literature highlighted significant risks, particularly for intermediate areas, based on high values in indicators such as: (1) the percentage of municipal area occupied by sites of national interest (SIN) (2014), and (2) the number of industrial plants with a relevant risk of accident (RIR) (2015).

This analysis specifically considered the dispersion index, the ratio of land consumption to population, and the composite municipal fragility index proposed by ISTAT.

Regarding the dispersion index, as expected, this is highest in inner areas (96.75), followed closely by intermediate areas (91.21). The core basin areas show a much lower average value (71.32). At the regional level, the data similarly align with expectations, with Liguria, Valle d'Aosta, and Piedmont presenting similar patterns across all areas, consistently exceeding the threshold of 90, with the exception of core basin areas in Piedmont (83.38), which contrast with the less dispersed situation in intermediate areas (86.75) and especially in core basin areas of Lombardy (66.54).

As for the change in the percentage of land consumed between 2006 and 2021, the values are positive across all categories analyzed, and, as expected, highest in core basin areas (5.66). In intermediate areas (4.30), the values are closer to those of core basin areas than to inner areas, which maintain lower values (1.82). At the regional level, the highest values are recorded in the core basin areas of Piedmont (5.42) and Lombardy (6.04), with relatively high values also in intermediate areas (4.48 and 4.57), especially when compared to inner areas (1.50 and 2.15). The highest values for inner areas are found in Valle d'Aosta, with a percentage of 2.93. In Liguria, the values are below average, ranging from 0.60 in inner areas to 1.45 in core basin areas, although the highest value is found in intermediate areas (2.23).

The composite municipal fragility index, proposed by ISTAT (2021), is constructed by combining twelve elementary indicators that describe the key territorial, environmental, and socioeconomic dimensions of municipal fragility. Although some of the individual indicators included in the index have also been used separately, the composite index provides a valuable tool for synthesizing data and facilitating territorial analysis across different scales. The data reveal increasing fragility as one moves from core basin areas (3.12) to inner areas (5.32), with intermediate areas showing an intermediate value (4.18). This confirms that, at the macro-area level, intermediate areas continue to act as transitional zones. A similar pattern emerges at the regional level. The highest fragility index values are recorded in Valle d'Aosta (6.93 for intermediate areas and 7.00 for inner areas) and in Liguria (5.04 for core basin areas, 4.54 for intermediate areas, and 5.97 for inner areas). In the case of Liguria, it is worth noting that the intermediate areas perform better than both the core basin and inner areas, indicating a lower risk of fragility for these areas.

Closely related to the environmental dimension, but also useful for analyzing mobility, is the indicator for the rate of high-emission motorization. In this case, inner areas (20.61) exhibit the highest values, followed closely by intermediate areas (18.30), while core basin areas have significantly lower values (12.60). At the regional level, the same pattern is observed, with the lowest values found in the core basin areas of Lombardy (11.55).

g) Mobility Dynamics

Continuing the analysis of mobility indicators, this section examines census data on total trips, both within and outside the municipality (ISTAT 2021). In terms of overall trips, intermediate areas lead the other categories, with 3,876,861 trips, slightly ahead of core basin areas (3,054,872) and significantly more than inner areas (228,045). However, these absolute values do not account for the

demographic weight of each area type. When viewed from a regional perspective, these data become more revealing, particularly in Liguria and Piedmont, where intermediate areas play a central role in "absolute mobility," generating a significant share of daily trips—far more than in core basin areas. In Lombardy, however, due to the dominant role of the core basin, these areas generate more trips than the intermediate areas.

As for trips outside the municipality, it is essential to recognize that, given the absence of the main urban hubs (i.e., the three capital cities), these figures should be interpreted as indicators of territorial mobility, rather than just directional flow. As anticipated in the literature, intermediate areas are those that generate the highest number of trips outside the municipality (2,235,099), only slightly more than core basin areas (2,024,884). This is unsurprising, given that core basin areas inherently include municipalities that gravitate around larger urban hubs, thus generating external trips. Inner areas, with their smaller populations and fewer services, are understandably less mobile, as observed in previous studies. At the regional level, Lombardy sees the highest share of trips outside the municipality, particularly in core basin areas (1,663,480), compared to 1,310,284 in intermediate areas, and much smaller numbers in inner areas (109,447). In both Liguria and Piedmont, intermediate areas exhibit greater mobility than core basin areas. In Liguria, for instance, intermediate areas generate over four times as many trips as core basin areas, while in Piedmont, this difference is just over twofold.

Regarding internal trips within the municipality, intermediate areas again display the highest absolute values (1,641,762), compared to core basin areas (1,029,988) and inner areas (90,701). The same pattern is observed at the regional level, with Liguria and Piedmont showing similar trends, while Lombardy exhibits a different dynamic. In Lombardy, internal trips in core basin areas (856,542) slightly surpass those in intermediate areas (819,636), while in the other regions, the difference is more pronounced. In Piedmont, internal trips in intermediate municipalities (580,234) are nearly four times higher than those in core basin areas (154,886). In Liguria, the contrast is even greater, with intermediate areas registering over eleven times more internal trips (213,790) than core basin areas (18,560).

An interesting observation emerges when comparing internal and external trips across regions and area categories. In core basin areas across all regions, the ratio of external to internal trips is approximately 2:1, meaning that for every internal trip, there are two external trips. This highlights the outward orientation of core basin areas, characterized by higher mobility towards external destinations. For intermediate areas, the situation is more varied across regions. In Piedmont,

Lombardy, and Valle d'Aosta, the ratios are relatively similar, with 1.23 in Piedmont, 1.20 in Valle d'Aosta, and 1.60 in Lombardy, reflecting a less pronounced tendency towards external trips, although these still account for the majority. In Liguria, however, internal trips slightly outnumber external ones (with a ratio of just over 1.19), indicating a different trend.

Finally, in the inner areas of Piedmont, Lombardy, and Liguria, a similar trend is observed, with external trips slightly exceeding internal ones (ratios of 1.37, 1.58, and 1.77, respectively). In Valle d'Aosta's inner areas, however, internal trips significantly exceed external trips, with a ratio of 2.30—meaning that for every external trip, there are more than two internal trips.

The summary table provides a detailed breakdown of the percentage of trips, both internal and external, relative to total travel, categorized by region and area classification.

h) **Accessibility Dynamics**

The analysis of trips, as described, evokes the conditions of centrality and accessibility across diverse municipalities, regions, and territorial divisions. Therefore, these data should be interpreted in relation to certain accessibility and centrality indicators that have been identified.

Primarily, these indicators are linked to mobility: *Minimum travel time to stations and highways* and the *accessibility index* for stations and highways, both calculated and distributed by ISTAT based on data from RFI and TOM TOM.

The first two indicators measure the "cost" in terms of the minimum time required to reach at least one selected destination (station or highway) from a given point of origin. This travel time reflects the distance traveled by road (using a private vehicle) to reach the infrastructure, starting from specific coordinates for each municipality. ISTAT provides a regional breakdown of minimum travel times, highlighting how "the extensive and well-distributed railway infrastructure ensures that a large portion of the national territory can reach a train station within relatively short travel times. Approximately 15% of municipalities are within 15 minutes of the nearest station; 53.4% are within 30 minutes, with peaks exceeding 85% in Umbria, 75.6% in Liguria, 71.6% in Friuli-Venezia Giulia, and over 60% in Veneto, Lombardy, Emilia-Romagna, Calabria, and Sardinia" (ISTAT 2022).

Following table report the data per region and population served.

Table 21: Municipalities from which at least one railway station with an active passenger service can be reached within the indicated territorial thresholds and population concerned. Source: ISTAT 2022, percentage data

MUNICIPALITIES

Codice regione	Denominazione regione	Raggio 15 minuti	Raggio 15-30 minuti	Raggio 30-45 minuti	Raggio 45-60 minuti	Oltre 60 minuti
1	Piemonte	9,4	38,3	30,0	14,6	7,8
2	Valle d'Aosta/Vallée d'Aoste	0,0	0,0	1,4	18,9	79,7
3	Lombardia	17,1	45,8	19,8	7,5	9,8
4	Trentino-Alto Adige/Südtirol	12,4	30,5	25,9	21,3	9,9
21	- Provincia autonoma di Bolzano/Bozen	14,7	35,3	21,6	16,4	12,1
22	- Provincia autonoma di Trento	10,8	27,1	28,9	24,7	8,4
5	Veneto	22,4	45,1	20,1	5,9	6,6
6	Friuli-Venezia Giulia	28,4	43,3	14,9	10,7	2,8
7	Liguria	34,6	41,0	18,8	2,6	3,0
8	Emilia-Romagna	12,8	52,4	19,5	7,9	7,3
9	Toscana	9,9	28,2	29,7	21,6	10,6
10	Umbria	28,3	57,6	12,0	2,2	0,0
11	Marche	13,2	40,5	31,3	11,9	3,1
12	Lazio	5,9	29,6	35,5	22,7	6,4
13	Abruzzo	2,6	16,1	30,8	23,6	26,9
14	Molise	3,7	10,3	27,9	44,1	14,0
15	Campania	12,5	40,7	33,3	10,2	3,3
16	Puglia	12,5	45,5	28,4	11,7	1,9
17	Basilicata	15,3	28,2	26,0	26,0	4,6
18	Calabria	17,8	49,5	25,0	7,4	0,2
19	Sicilia	11,3	25,1	18,7	14,1	30,8
20	Sardegna	26,0	38,7	17,2	8,2	9,8
	Totale Italia	14,7	38,7	24,5	12,5	9,5

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Codice regione	Denominazione regione	Raggio 15 minuti	Raggio 15-30 minuti	Raggio 30-45 minuti	Raggio 45-60 minuti	Oltre 60 minuti
1	Piemonte	36,2	37,5	18,1	6,5	1,7
2	Valle d'Aosta/Vallée d'Aoste	0,0	0,0	2,9	14,4	82,8
3	Lombardia	46,8	38,3	10,4	2,0	2,5
4	Trentino-Alto Adige/Südtirol	40,7	28,1	16,1	9,6	5,4
21	- Provincia autonoma di Bolzano/Bozen	37,9	32,3	14,2	9,2	6,4
22	- Provincia autonoma di Trento	43,5	24,0	18,0	10,0	4,4
5	Veneto	42,8	39,1	14,2	2,8	1,1
6	Friuli-Venezia Giulia	57,7	36,1	4,4	1,5	0,3
7	Liguria	82,8	13,7	3,1	0,2	0,1
8	Emilia-Romagna	44,3	40,6	12,4	1,7	1,1
9	Toscana	38,6	25,9	24,2	9,3	1,9
10	Umbria	61,2	31,0	7,4	0,5	0,0
11	Marche	44,0	33,4	19,0	3,2	0,3
12	Lazio	22,4	41,5	28,7	7,1	0,3
13	Abruzzo	19,6	33,2	22,5	7,6	17,1
14	Molise	16,2	14,6	18,1	47,6	3,6
15	Campania	23,1	53,1	18,0	3,6	2,1
16	Puglia	38,3	39,8	18,0	3,3	0,6
17	Basilicata	30,2	33,7	16,4	17,6	2,2
18	Calabria	42,8	34,0	18,1	5,0	0,1
19	Sicilia	36,9	15,9	10,0	10,5	26,7
20	Sardegna	48,9	28,4	12,4	4,5	5,7
	Totale Italia	39,1	35,9	15,9	5,0	4,1

Table 22: Municipalities from which at least one highway access can be reached within the indicated territorial thresholds and population concerned. Source: ISTAT 2022, percentage data

MUNICIPALITIES

Codice regione	Denominazione regione	Raggio 15 minuti	Raggio 15-30 minuti	Raggio 30-45 minuti	Raggio 45-60 minuti	Oltre 60 minuti
1	Piemonte	48,4	36,0	10,9	3,0	1,6
2	Valle d'Aosta/Vallée d'Aoste	58,1	31,1	10,8	0,0	0,0
3	Lombardia	44,0	26,7	11,8	7,8	9,7
4	Trentino-Alto Adige/Südtirol	23,0	26,2	25,2	16,3	9,2
21	- Provincia autonoma di Bolzano/Bozen	33,6	24,1	17,2	13,8	11,2
22	- Provincia autonoma di Trento	15,7	27,7	30,7	18,1	7,8
5	Veneto	48,3	33,4	12,6	4,1	1,6
6	Friuli-Venezia Giulia	57,2	33,0	7,9	1,9	0,0
7	Liguria	56,0	29,5	11,1	2,1	1,3
8	Emilia-Romagna	39,6	35,1	14,6	6,4	4,3
9	Toscana	27,1	28,2	20,1	13,6	11,0
10	Umbria	14,1	23,9	20,7	27,2	14,1
11	Marche	25,1	38,8	20,7	12,8	2,6
12	Lazio	29,1	43,6	21,2	5,4	0,8
13	Abruzzo	40,0	37,7	16,4	5,2	0,7
14	Molise	5,1	14,7	29,4	46,3	4,4
15	Campania	43,3	28,4	17,5	8,4	2,5
16	Puglia	17,9	17,9	15,2	7,4	41,6
17	Basilicata	4,6	19,1	31,3	32,8	12,2
18	Calabria	23,5	30,2	17,3	15,1	13,9
19	Sicilia	36,9	29,0	15,1	11,5	7,4
20	Sardegna	44,3	28,9	13,8	6,9	6,1
	Totale Italia	38,9	30,7	15,1	8,6	6,6

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Codice regione	Denominazione regione	Raggio 15 minuti	Raggio 15-30 minuti	Raggio 30-45 minuti	Raggio 45-60 minuti	Oltre 60 minuti
1	Piemonte	77,0	20,3	2,5	0,2	0,1
2	Valle d'Aosta/Vallée d'Aoste	87,5	8,9	3,6	0,0	0,0
3	Lombardia	57,3	32,7	5,7	1,9	2,3
4	Trentino-Alto Adige/Südtirol	50,5	26,0	11,4	7,5	4,6
21	- Provincia autonoma di Bolzano/Bozen	50,1	27,7	8,4	8,0	5,8
22	- Provincia autonoma di Trento	50,8	24,3	14,3	7,1	3,5
5	Veneto	57,6	31,2	9,9	1,0	0,2
6	Friuli-Venezia Giulia	80,8	18,2	0,7	0,2	0,0
7	Liguria	93,0	5,4	1,4	0,1	0,1
8	Emilia-Romagna	70,2	22,7	5,2	1,3	0,5
9	Toscana	43,4	37,7	10,8	3,8	4,4
10	Umbria	4,6	28,1	33,6	23,4	10,3
11	Marche	59,6	25,9	11,3	3,0	0,2
12	Lazio	56,6	27,3	9,6	6,4	0,1
13	Abruzzo	80,8	13,9	3,9	1,3	0,1
14	Molise	20,3	15,1	20,8	41,8	2,0
15	Campania	73,6	17,7	5,7	2,5	0,5
16	Puglia	39,3	19,2	12,4	5,2	24,0
17	Basilicata	5,5	29,3	41,4	18,7	5,2
18	Calabria	39,1	25,2	15,6	8,8	11,4
19	Sicilia	57,4	21,5	8,5	8,9	3,7
20	Sardegna	58,1	27,7	7,0	3,5	3,8
	Totale Italia	59,1	25,2	8,3	4,0	3,4

Concerning our analysis, as expected, the average minimum travel times to stations are significantly lower in core basin areas (18.16 minutes) compared to intermediate areas (30.82 minutes) and inner areas (59.17 minutes), although intermediate areas maintain an intermediate position between the

two. From a regional perspective, some observations are particularly interesting. Aside from Valle d'Aosta, where, as ISTAT highlights, "only one-fifth of municipalities are less than 60 minutes away from the nearest train station (with just 1.4% between 30 and 45 minutes)," the values for intermediate and core basin areas are relatively close in Liguria, Lombardy, and Piedmont. The gap is narrowest in Piedmont (24.39 minutes for core basin areas and 31.63 for intermediate areas) and wider in Lombardy (16.10 and 29.75 minutes, respectively).

An interesting case is Liguria, where the average travel times to the nearest station are shorter in intermediate areas (17.75 minutes) than in core basin areas (24.85 minutes). This is likely due to the structure of the coastal, polycentric regional railway network, which has historically been less influenced by the development of a dominant municipal hub. The territorial development of Liguria, shaped by the spread of stations across the region, has been more influenced by small coastal towns than by the presence of a single large urban attractor.

Another interesting observation emerges when comparing Piedmont and Lombardy: although Lombardy has shorter minimum travel times in core basin areas, the gap between intermediate areas (29.75 minutes) and especially inner areas (61.11 minutes) is much wider compared to Piedmont, where values range from 24.39 minutes in core basin areas to 58.09 in inner areas, passing through 31.63 in intermediate areas. In other words, the overall travel times are longer in Piedmont, but the differences between area types are less pronounced.

Moving on to minimum travel times to reach highways, ISTAT notes that «as with train stations, the widespread distribution of infrastructure favors relatively short travel times from municipalities. 38.9% of Italian municipalities can access the highway network within 15 minutes. Extending the travel time to 30 minutes, the share of municipalities served by at least one highway access rises to around 70%. Only 6.6% of municipalities are more than 60 minutes away from the nearest highway acces» (ISTAT 2020, p. 4).

Looking at the analysis, it appears that the travel times in core basin areas (11.02 minutes) and intermediate areas (19.05 minutes) are quite similar, especially when compared to the times required from inner areas (50.86 minutes). From a regional perspective, Liguria shows smaller differences between core basin areas (11.74 minutes), intermediate areas (14.14 minutes), and inner areas (36.59 minutes). In Piedmont, the differences are slightly more pronounced (10.58, 16.16, and 41.65 minutes, respectively), but the widest gap, as with railway access, is observed in Lombardy (11.09, 23.47, and 59.72 minutes).

Building on this measure, ISTAT calculated the accessibility index for both train stations and highways. As stated, «measuring the distance of a territory from a given infrastructure may not be sufficient, especially when one aims to highlight what being at a certain distance from an infrastructure allows one to 'do' or 'obtain' in terms of services, and thus the potential in terms of connection opportunities. The 'capacity of a territory' (i.e., a municipality) to (potentially) access the services provided by certain transport infrastructures can be measured by summing the potential opportunities offered by each reachable infrastructure, weighted by the 'cost' (travel time) required to reach them. In practice, differences between infrastructures in terms of services offered (W) are measured using the following indicators: • For train stations, the number of trains per day providing passenger services at selected stations (source: RFI, 2022); • For highway access points, it is assumed that there are no differences between them, as each toll booth provides the same service by allowing interconnection with the national network.»

The results, at the national level, are summarized in the following maps and tables (maps 33 and 34).
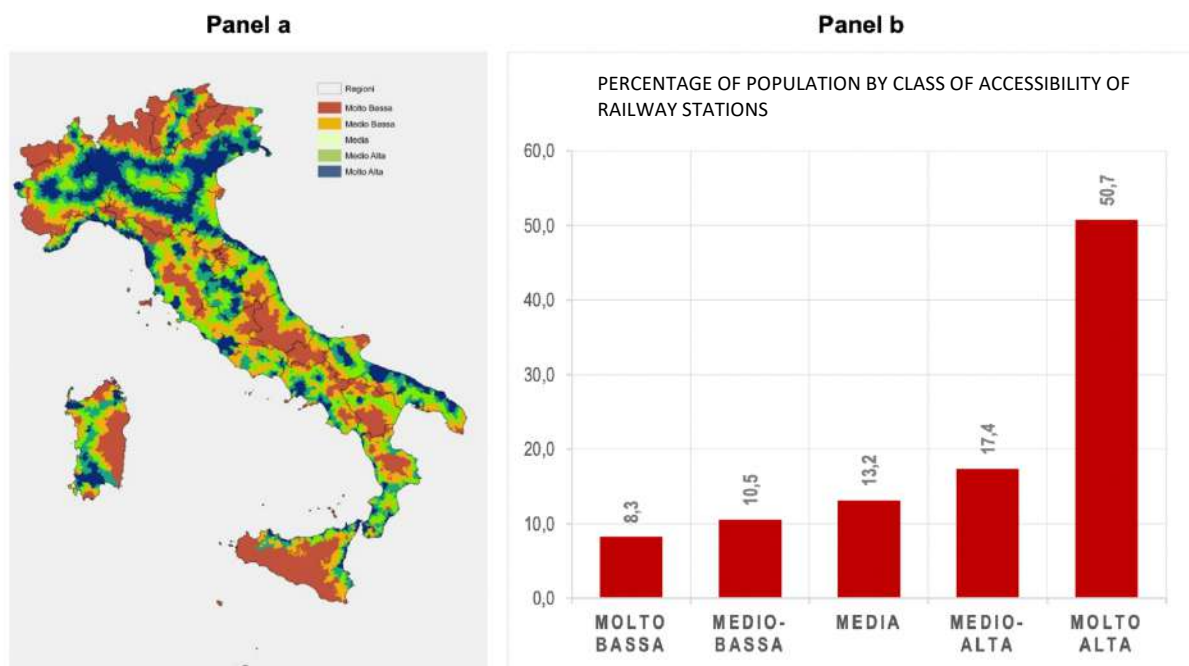
Map 33: Municipalities by class of accessibility to railway stations and relative population shares. Source: Istat 2022
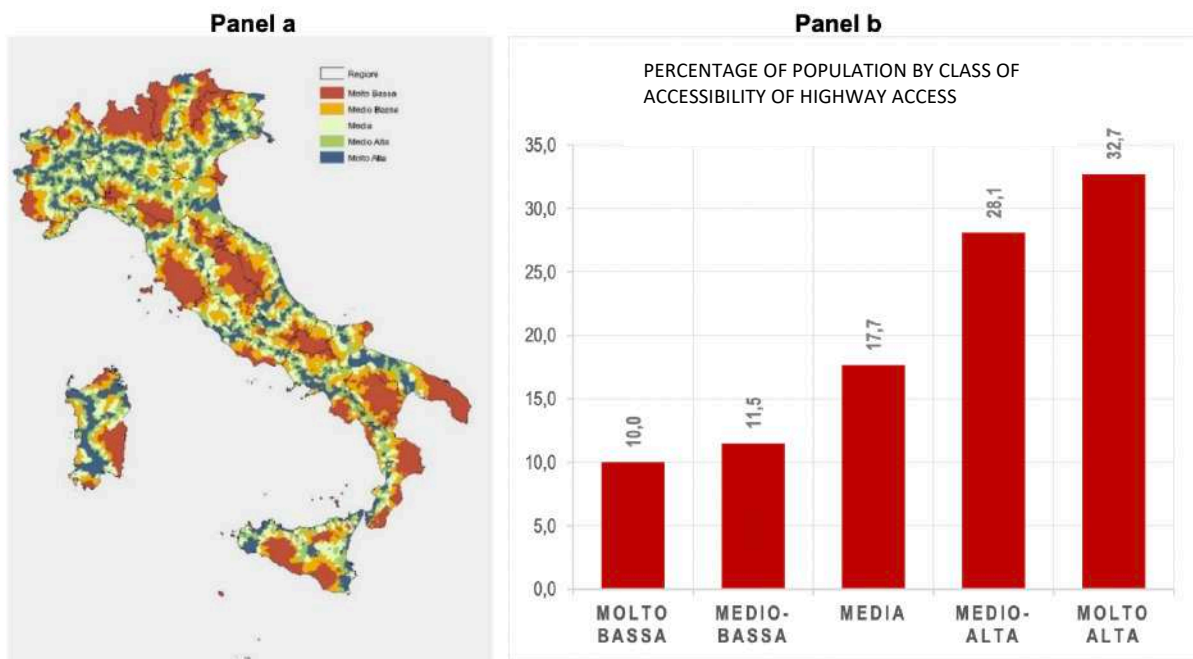
Map 34: Municipalities by class of accessibility to highway access and relative population shares. Source: Istat 2022

From the perspective of the proposed analysis, looking at the railway accessibility index in the analyzed contexts it can be observed that, consistent with previous observations, Lombardy maintains a wider gap between core basin areas (14.19), intermediate areas (3.03), and inner areas (0.08), while the differences are more contained in Liguria, where values range from core basin areas (3.45), to intermediate areas (4.47), and inner areas (0.56). Once again, the accessibility index for train stations in Liguria's intermediate areas is higher than in the core basin areas.

Regarding the highway accessibility index, intermediate areas show lower values (40.90 in Piedmont, 35.34 in Lombardy, 48.24 in Valle d'Aosta, and 41.79 in Liguria) compared to core basin areas, albeit with varying degrees of difference: Liguria's intermediate areas are closer to the core basin, while Lombardy's intermediate areas are more distant. In Lombardy, the lowest value for highway accessibility is found in inner areas (5.34).

These considerations further highlight the importance of examining the «essential services accessibility index," which "measures the degree of peripheralization of a territory in relation to the centers providing essential services, as defined by the National Strategy for Inner Areas (SNAI). The indicator is calculated as the average road travel time to reach the nearest central municipality, identified based on the concurrent presence of three essential services (education, healthcare, and mobility). Travel time is naturally influenced by the geomorphological characteristics and level of

infrastructure of a territory. Source: ISTAT's elaboration of commercial road network data (TOM TOM) and territorial bases (ISTAT)».

As expected, core basin and intermediate areas show similar values (16.43 and 22.47, respectively), while in inner areas of the Northwest, it takes an average of 54 minutes to reach essential services. Analyzing regional dynamics reveals some differences. Intermediate areas have similar times across all regions, around 20 minutes (22.30 in Piedmont, 25.55 in Valle d'Aosta, 22.19 in Lombardy, and 23.92 in Liguria). However, Liguria's core basin areas behave differently from those in Piedmont (16.21) and Lombardy (15.43). This could be explained by the characteristics of the main municipality's reference area, which includes inland municipalities where the geomorphological features, combined with historical processes of "coastal migration," have resulted in a more limited range of essential services.

i) Dynamics of centrality and services

This topic is of particular importance and is further analyzed using other indicators, the most notable being the *Metropolitan Functions Density (average)*. This metric is calculated to assess the degree of "metropolitanization," or the concentration of metropolitan-level services and functions in a given area. It is typically used to identify metropolitan regions (Caiello and Colleoni 2013; Palvarini and Boffi 2020; Colleoni, Boffi, and Palvarini 2012). These regions are defined by the presence of specific key functions that allow them to exert influence over a wide territorial area, offering valuable insights into the dynamics of centrality that are unfolding. This composite indicator is calculated by systematizing demographic dimension, considering the number of inhabitants (ISTAT 2021); productive dimension, based on the number of employees in manufacturing, tertiary, and public services sectors, obtained from the points of interest database (Geolytica 2021); and territorial interdependence dimension, based on mobility flows derived from the analysis of the OD matrix from the census. The results (0-1) show, as expected more high values in the core basin areas (0,42) than intermediate (0,091) and inner areas (0,024), at the macro area level thus the intermediate values are closer to the inner ones. Looking at the regional variables, Lombardy core basin areas show the higher values (0,489) followed by the Piemonte same areas (0,249). Intermediate values of Lombardy show data higher than the central areas of Liguria. This shows the very low metropolitan vocation of Liguria (and of course Aosta Valley). Values of inner areas of the whole sector are comparable with the intermediate areas everywhere except for Lombardia intermediate landscape that is the only intermediate area closer to metropolitan values.

Additional services were considered, selected based on available indicators, such as the presence of healthcare facilities (ISTAT 2019), which had already been analyzed in aggregate within the essential services accessibility index, and the presence of bank branches (ISTAT 2020). The latter is not typically included in the basket of essential services, although there is no unanimous consensus in the literature on this. In the case of healthcare, the data show the absolute distribution of healthcare institutions by municipality. At an aggregate level, healthcare institutions are more prevalent in intermediate areas of the reference quadrant (133) compared to core basin areas (77), which typically rely on the main urban center. The number of healthcare institutions is limited in inner areas (7). However, as this is an absolute figure, it cannot be directly related to the territorial size or population of these areas, which is much larger in intermediate areas.

At the regional level, the highest concentration of healthcare facilities is found in Lombardy: 61 in core basin areas, 79 in intermediate areas, and 7 in inner areas. In contrast, Liguria has significantly fewer facilities (1 in core basin areas, 11 in intermediate areas, and none in inner areas), a difference that can be attributed to its smaller population. As we can see, intermediate areas behave very differently across the four regional contexts, so no specific regional pattern can be identified for intermediate areas in this regard.

Looking at the distribution of bank branches, as expected, the number increases as one approaches core basin areas: an average of 0.79 branches in inner municipalities, 1.75 in intermediate municipalities, and 4.08 in core basin municipalities. It is worth noting the close proximity of values between inner and intermediate areas. Regionally, some differences emerge, such as the greater prevalence of bank branches in Lombardy across all areas: core basin areas (4.66), intermediate areas (2.17), and inner areas (1.09). Interestingly, in Liguria, intermediate areas (2.13) have higher values than core basin areas (1.54). In Piedmont, the values are staggered: inner areas (0.33), intermediate areas (1.34), and core basin areas (2.54).

This data can be linked to the next indicator regarding digital access, particularly the spread of internet banking. This map (EUROSTAT 2023) shows the territorial distribution of internet banking usage at a regional level across Europe.

People using internet banking, 2023

(% of people aged 16–74 during the 3 months preceding the survey, by NUTS 2 regions)

EU = 63.9

- ≥ 92.5
- 80.0 – < 92.5
- 67.5 – < 80.0
- 55.0 – < 67.5
- 40.0 – < 55.0
- < 40.0
- Data not available
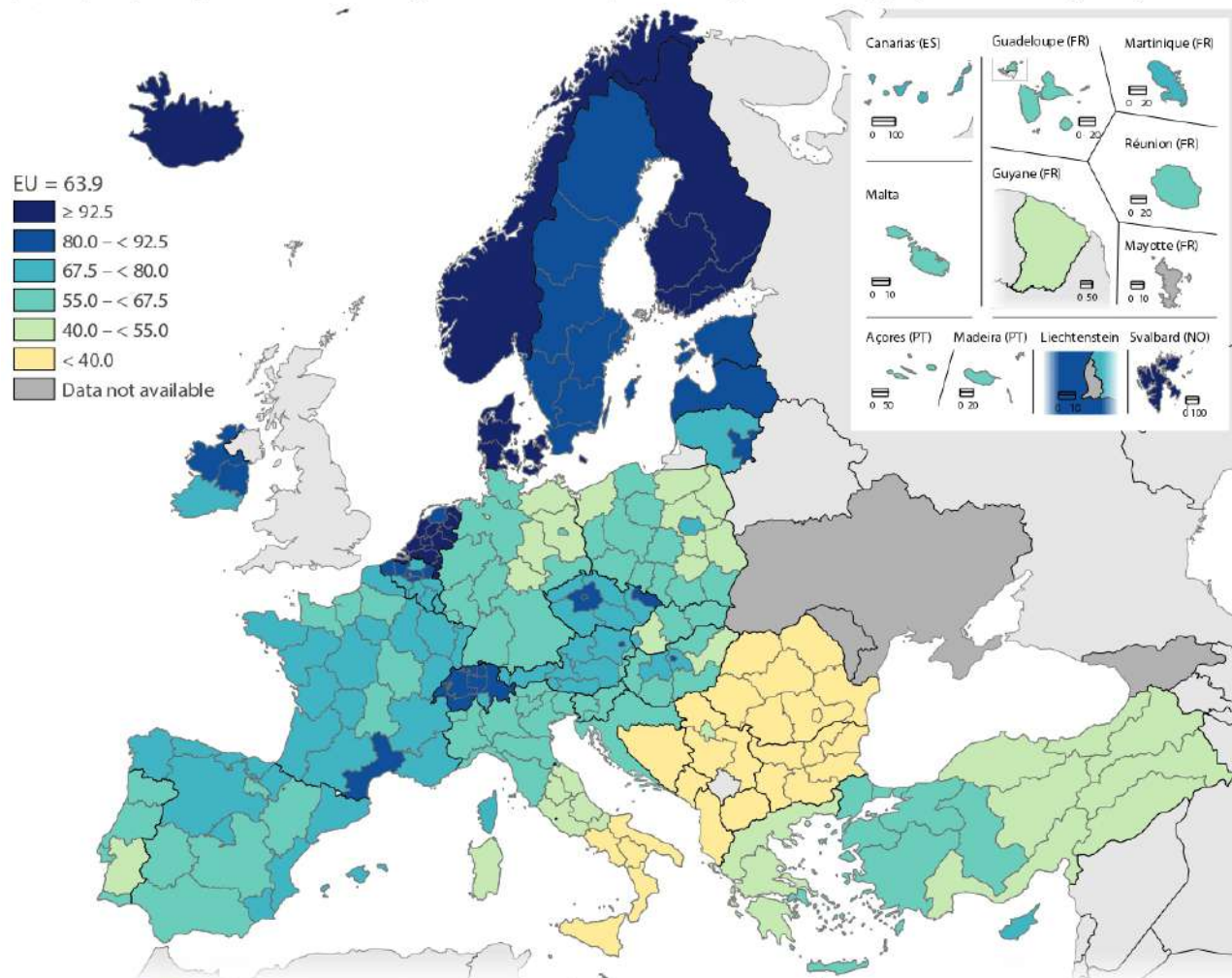
Note: Germany, Greece and Türkiye, NUTS level 1. Croatia, Norway and Albania: national data. Albania: 2022. Iceland and North Macedonia: 2021. Corse (FRM0): low reliability.
Source: Eurostat (online data codes: isoc_r_iuse_i and isoc_ci_ac_i)

Administrative boundaries: © EuroGeographics © UN–FAO © Turkstat
Cartography: Eurostat – IMAGE, 06/2024

Map 35: People using internet banking. Source: EUROSTAT 2023

l) Digital dimension

This aspect leads to the digital dimension, here examined through the indicator "Average ADSL Download Speed" (AGCOM 2020), which provides an initial overview of the degree of digitalization in the areas under study. What can be observed is that, regarding a now basic and no longer innovative indicator like ADSL download speed (such as nowadays the spread of FTTH connection), a substantial territorial uniformity has been reached. Inner areas still report a lower value (7.60), although not far from the average values of intermediate areas (8.67) and core basin areas (8.85).

From a regional perspective, no significant differences emerge. The widest gaps are found in Liguria, where speeds range from 9.27 in core basin areas to 6.68 in inner areas, and in Piedmont, where speeds go from 8.63 to 6.13 in inner areas. For intermediate areas, it is worth noting that Lombardy (9.04) exceeds the speed found in core basin areas (8.88), and also has higher values than other regions for inner areas (8.51), except for Valle d'Aosta's inner areas (9.08).

M) Culture dimension

The last dimension worth exploring is related to culture, although data availability is limited. ISTAT provides data on the territorial distribution of museum institutions by municipality. In absolute terms, intermediate areas host the highest number of museums, with 282 in Piedmont, 45 in Valle d'Aosta, 221 in Lombardy, and 125 in Liguria. However, when this data is adjusted for the number of municipalities, it becomes clear that the percentage is relatively high in Liguria and Valle d'Aosta, where 73.53% of intermediate municipalities in Liguria have a museum, and a very similar figure is found in Valle d'Aosta (73.77%). In Lombardy, the percentage is 24.23%, while in Piedmont it is 29.47%. This figure aligns with the previously mentioned tourism vocation of these areas.

In core basin areas, the dynamics are similar to those in intermediate areas, where only 27% of municipalities in Piedmont and 24% in Lombardy have a museum, whereas the figure rises to 57.14% in Liguria. Finally, it is interesting to note that in both Piedmont and Lombardy, the percentage of museum institutions is higher in inner areas (38.93% and 33.33%, respectively) than in core basin areas. This, too, can be attributed to the tourism-oriented nature of these territories.

5.3 ON LIMITS OF TERRITORIAL CLASSIFICATION

Con le mie classificazioni ho sempre un problema: non durano;
non ho ancora finito di fare ordine che quell'ordine è già caduco.
(G.Perec 2003)

In light of the results presented, this section aims to address some limitations associated with the proposed classification and territorial classifications in general.

The following aspects will be briefly discussed: first, specific limitations of the classification proposed here will be highlighted, focusing on territorial boundaries and the analysis of indicators. Then, attention will turn to the limitations linked to the availability of data and the geographic areas they reference. Lastly, insights from the literature regarding territorial classification as a tool will be considered.

The analysis presented here adopts a macro-area approach with regional specificity. However, the framework—using the municipality as the unit of analysis—can be expanded in future studies by considering alternative aggregations, such as provincial-level analyses.

This study has helped respond to questions regarding the need for updated territorial metrics that reflect the ongoing transformations of regional landscapes. Moreover, it has sought to bring visibility to an intermediate territorial scenario that is at once specific and somewhat ambiguous.

In contrast to inner areas, whose definition benefits from extensive work associated with the National Strategy for Inner Areas, as well as a long-standing tradition of rural and mountainous studies, the use of Functional Urban Areas (FUAs) combined with a demographic approach leaves room for further research. A closer focus on the phenomena and territories under analysis allows for the identification of territorial characteristics that might remain invisible at a broader scale.

Some imprecisions in the maps (Maps 15, 16) were intentionally retained for conceptual rather than operational reasons (in the data analysis, inner municipalities (E, F), as defined by SNAI, were preserved in the classification as inner areas). This approach highlights the "blurred" nature of territorial boundaries, especially in cases where core and inner areas overlap. These overlaps can occur for various reasons, which are not the focus of this discussion but can be attributed, in part, to the contextual nature of certain phenomena, such as an inner area gravitating toward a core area, becoming part of its catchment and commuting zone.

This image also emphasises the representational role of intermediate areas, which become even more visible when central and internal areas are directly juxtaposed and suggest to us some elements regarding the present or absent degrees of territorial construction.

This reflection ties into the broader limitation inherent in using static territorial classifications to capture the dynamic nature of real-world territories. This tension, widely acknowledged in the literature, arises from the fact that territories are defined by constant change and processuality, which risks reducing them to the oversimplified image of a "container" (Brenner and Schmidt, 2015). While classifications must be understood as temporary and inherently unstable, they are nevertheless crucial tools for measuring and interpreting territorial processes. The risk of classifying territories into rigid containers also evokes other challenges linked to territorial taxonomies, particularly the political risks involved, such as the well-known issues related to "labeling".

On the other hand, classifying intermediate areas, as noted in section 1.7, offers the potential for a renewed "territorial voice" by identifying specific tensions and issues that can lead to responses more appropriately aligned with the scale in question.

The final set of limitations concerns data availability. While substantial progress has been made—particularly with respect to digital and environmental data, and in the development of complex territorial indices such as those used for measuring territorial fragility and accessibility—certain areas of investigation remain underrepresented. These include, for example, cultural dimensions and, more critically, the chronic lack of systematic, integrated, and publicly accessible data on mobility dynamics, such as the national travel surveys conducted in other nearby countries like Sweden[20] , UK[21] and Switzerland[22] .

In summary, to further refine territorial classifications and broaden the understanding of evolving dynamics, there remains considerable room for improvement, which future research can help address.

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[20] https://www.trafa.se/en/travel-survey/travel-survey last visit: 10/10/24
[21] https://www.gov.uk/government/collections/national-travel-survey-statistics last visit: 10/10/24
[22] https://www.bfs.admin.ch/bfs/en/home/statistics/tourism/travel-behaviour.html last visit: 10/10/24

5.4 SUMMARY OF THE CHAPTER

This chapter has provided an overview of the morphologies and dynamics of intermediate areas in Italy today, with a particular focus on Northwestern Italy—considered in the literature as a region undergoing profound transformation and facing emerging challenges.

The chapter first addressed the definitional aspects outlined in the research objectives, then focused on the ongoing dynamics. The definitional framework was constructed by considering indicators across multiple territorial dimensions, offering a complex portrait of the area. This conclusion will summarize the behavior of intermediate areas based on this analysis.

From a demographic standpoint, population dynamics in intermediate areas vary regionally, showing positive trends in all regions except Liguria, which is affected by overall depopulation. Inner areas, by contrast, display a more uniform trend. Regarding average age, regional differences are more pronounced than classification-based ones; however, it is worth noting that intermediate areas tend to behave more similarly to core basin areas. A comparable pattern emerged in the dependency ratio, where inner areas have significantly higher values than other partitions, with intermediate areas occupying a median position between the two.

More interesting data emerge from the education dynamics, where lower education levels align inner and intermediate areas. This trend is also reflected in university enrollment rates among young people, where, consistently across regions, intermediate areas show values closer to those of inner areas.

In terms of migration, intermediate areas appear to have higher values than core basin and inner areas, indicating greater mobility. They also have the highest percentage of foreign residents, with slight regional variations. Data on household composition reveal similar dynamics between core basin and intermediate areas, with inner areas showing a higher proportion of single-person households due to aging. For households with three to five members, intermediate areas again act as a middle ground, equidistant from the other two categories.

Economically, the three indicators analyzed follow a similar trend, with intermediate areas acting as a bridge between inner and core basin areas. Regarding real estate data, this must be interpreted in relation to the tourism dynamics of the macro-area. While regional differences exist—such as Liguria's strong focus on tourism—intermediate areas are generally the least expensive and contain the highest percentage of non-tourist municipalities. This can also be linked to the cultural dimension, specifically the distribution of museums, a tourism-related indicator. Core basin and intermediate areas have fewer museums, though with noteworthy regional variations.

Environmentally, the dispersion index shows that, as expected, intermediate areas resemble inner areas due to lower territorial saturation. However, the land consumption data reveal a transformative dynamic, aligning intermediate areas more closely with core basin areas.

The dimensions of accessibility, mobility, service provision, and fragility are the most relevant to the topic addressed in this thesis.

In terms of mobility, the analysis shows that intermediate areas have a high mobility rate, driven by their territorial configuration and demographic scale. This makes them a key subject for studies on mobility and accessibility. Regional data allow for a more detailed exploration of these processes. One interesting observation concerns the ratio of internal and external trips by partition and region. In almost all cases, external trips outnumber internal ones. On average, in core basin areas, for every internal trip, there are two external trips; in intermediate areas, the ratio is around 1.5 (with higher peaks in Lombardy and lower in Liguria, where internal trips exceed external ones). This highlights the stronger outward mobility of core basin areas compared to intermediate areas, due to the specific relationship between core basin areas and their surrounding centers.

While intermediate areas experience more trips overall, these trips are less externally oriented than those in core basin areas, and tend to be made with older vehicles. Data on high-emission motorization show that core basin areas are less polluting than intermediate and inner areas, which perform similarly.

In terms of travel times, minimum access times to stations and highways show that, as expected, intermediate areas behave as their name suggests, with values between inner and core basin areas. However, core basin areas have significantly shorter access times. For highway access, core basin and intermediate areas are closer in value, with inner areas being significantly more distant. The accessibility index for stations and highways highlights the crucial role of regional differences. In Lombardy, for example, the gap is much wider: the station accessibility index is much higher in core basin areas than in intermediate and inner areas, whose values are more closely aligned. This reflects different territorial patterns across regions, as other regions show more homogeneous values across categories.

This leads us to the essential services accessibility index, where intermediate areas show values close to those of core basin areas, confirming that accessibility to essential services is not a major issue for intermediate areas. The widespread presence of these services reflects the historically polycentric

nature of intermediate areas and, more broadly, Northwestern Italy. Further research will be needed to investigate the role of *new* types of essential or specialized services in intermediate areas. For example, the digitalization level and the presence of banking services are examined here. While banking services are not typically classified as essential, they are crucial in daily life. In this regard, intermediate areas show values closer to those of inner areas, highlighting the need to address emerging demands. Regarding digitalization, basic technologies are widely available across all areas and regions, with intermediate and core basin areas showing similar values, while inner areas have slightly lower—but not significantly different—values. Further research is required to explore the territorial distribution of innovative digital technologies. Lastly, additional analysis is also necessary concerning the density of metropolitan services in intermediate areas. Preliminary data suggest that intermediate areas, as expected, differ from core basin areas, though with significant regional variations. Regions such as Liguria and, unsurprisingly, Valle d'Aosta are far removed from having a widespread metropolitan dimension. In conclusion, with respect to the initial questions concerning the potential marginalisation processes of the intermediate areas of the North West, this study provided a multidimensional picture in which phenomena were analysed at different scales, macro-area and regional, obtaining a complete picture with respect to the incidence of certain phenomena and finding where the regional variable, thus at a smaller scale, plays a more important role than a general trend.

Further research is needed to expand the set of relevant indicators and explore other scales of analysis, which are sometimes indispensable. This study has also offered a first glimpse into the gap between core basin, intermediate, and inner areas, laying the foundation for understanding territorial marginalization processes. Finally, the significant volume of trips in intermediate areas suggests that this scenario holds promise for future studies on mobility and accessibility.

CHAPTER 6 - INFRASTRUCTURE AND RAILWAY IN ITALY: MULTIPLE ACTORS, SCALES AND STRATEGIES OF TRANSFORMATIONS

Introduction

As this work will illustrate in detail, the case of the railways can be emblematic in framing the processes just outlined. As extensively documented (Schivelbush 1977), historically and internationally railway infrastructures have been intertwined with processes of territorial transformation, the recalibration of space-time categories, and the creation and reorganisation of geographies. The railways themselves, in Italy and abroad, have been the subject of profound transformation in recent decades. This work therefore aims to investigate the results of the dual node of territorial and infrastructural transformation.

In line with what has occurred in the international context, a great transformation has in fact taken place in the railway sector since the 1990s, which has affected the political, managerial and strategic vision of the railways. This has taken place through processes and organisational forms such as regionalisation, privatisation, the division between market-based service and local-based supply - regulated by service contracts -, the division between service provider and infrastructure owner, the launch of high-speed lines, all of which can be summarised in a new management system and, more generally, a cultural transformation of the company (Maggi, 2009).

Infrastructural transformations, such as high-speed trains, thus completely recalibrate the mobility experience in terms of the conception of travel, perception and parameters of distances, and travel figures. This happens simultaneously both with respect to the movement capacities of users, travelers, passengers, and 'from the inside, from the operator's point of view'.

Moreover, this infrastructural transformation has had a different role and weight if one looks at it from different spatial perspectives: the closure of minor lines, the concentration of attention on high-speed and market lines, the concentration on high-speed stations in metropolitan cores, are just some of the elements that can be taken into consideration when looking at railway transformations from the perspective of so-called intermediate areas. At first glance, the latter have been intensely the subject of significant changes related to rail traffic, so they are a good lens to look at both this infrastructural and territorial transformation but also, more broadly, to investigate the habits, behaviour and mobility demands arising from this specific context.

6.1 The Railway path between imagination and construction

The analysis of railways is complex because it encompasses a wide array of different worlds, histories, elements, and forms. It includes the railway itself, in its constructive entirety, such as tunnels, bridges, viaducts, or everything generally categorized as "fixed installations": stations, warehouses, signals, and poles. Moreover, it can also encompass a material history of the trains themselves. However, "studying the railway" also involves analyzing other forms such as railway tickets or timetables. On the other hand, the railway can also be considered in terms of its corporate history, as an economic enterprise, and in its political history, particularly the "national policy of railway transport."

Railways are a world shaped by a multitude of actors, influencing or being influenced by it. Additionally, it is a world of workers, the railway employees, and passengers, including commuters. This complex analysis also reflects on the broader system of transportation.

In the following pages, some relevant element regarding the organization, the actors and the planning strategies are outlined to give a portrait of the infrastructural situation and change and to better contextualize the phenomena addressed.

The website of the Italian State Railways (Ferrovie dello Stato) recounts its history through various means: infographics, historical photographs, short films, and documentaries. The FS Italian Foundation, established in 2013, works to preserve and enhance the historical and technical heritage of the railways through the maintenance of an audiovisual archive and a library. It also manages the National Railway Museum of Pietrarsa, the restoration of historical rolling stock, and the organization of historical train journeys along tourist routes.

For a "historiography" of the railways, Guadagno (2004 in Giuntini) provides a clear overview of studies in this field, with particular attention to the use of various types of sources, which are often very diverse[23].From a bibliographical perspective, it is worth to emphasize the significant role played by "local publications", which echo the voices of enthusiasts who are equally crucial in conducting research in this area.

The strategic role of the railways—and transportation in general—is clear from various viewpoints. Of course, it could be interesting focusing on the role railways played in shaping imaginations tied to

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[23] Moreover, the website *http://www.trenidicarta.it/*, a bibliography of Italian railway publications, highlights works published in this field year by year

significant historical moments, such as the Italian unification, which chronologically follows the development of the Italian railway system. Maggi (2017, p. 8) highlights how railways played an important role in the construction of the post-unification state, both from a physical-territorial point of view and in the broader sense of "nation-building" (cfr. 2.2). The perspectives of mobility and the associated possibilities altered perceptions of belonging, which is evident in the "post-unification Italian project." The history of the railways seems to be one of progressively "coming out of isolation." As seen theoretically, the construction of railway lines thus becomes a means of constructing and defining territory, initiating processes of knowledge among inhabitants.

The depopulation processes produced in small towns, coupled with the emerging crisis of certain communities and many now-anachronistic railway lines, led to the phase known as "cutting the dead branches." Many secondary lines, starting after World War II, were either suspended or gradually abandoned. The number of "abandoned railways" grew considerably over the years. Renewed interest in these lines has been spurred by concerns over pollution from road transport, a vintage taste for ruins, a sense of nostalgia, and a "return to the villages" (3.3). Various publications recount the stories of these old lines and promote the territories they passed through. The FS Foundation offers monthly trips on historical lines (6.6.1).

During the war, bombings and military offensives severely targeted the railway network, leaving it heavily damaged in the aftermath of the conflict: 30% of the total infrastructure was destroyed, with particularly severe disruptions in the central region, where nearly all lines were cut off. The damage extended not only to the infrastructure itself—bridges, tunnels, buildings, stations, depots, and electrical systems—but also to the rolling stock, including locomotives and carriages. While in 1938 the journey from Milan to Rome took 6 hours, by 1945 it required a staggering 33 hours (Maggi 2007).

With the substantial support of the Marshall Plan, the pre-war situation was largely restored in the immediate aftermath of the conflict. Nevertheless, the railway industry soon entered a period of pronounced stagnation, facing fierce competition from road transport. The construction of an extensive highway network was imminent, as was the mass adoption of affordable automobiles. Despite the "democratization" of transport and mobility, the railway system struggled to fully capture the profound societal transformations of the post-war era, exacerbated by infrastructure modernization efforts that were slow to materialize.

On a national scale, the modal shift from rail to road transpired between 1949 and 1965. In 1949, road freight surpassed rail freight, and by the 1960s and 1980s, the share of rail freight had dropped from

24% to 10.5%. Passenger rail, which initially resisted the rising competition from other transport modes, saw its share decrease from 16.7% in 1965 to 9.31% in 1980. Although there was significant growth in the overall demand for mobility, the proportion of passengers using rail transport diminished.

The rise of cars and motorcycles introduced, for the first time, a "private" concept of mobility in contrast to the previously dominant model. This private mode of travel became ideologically connected to the freedom of movement along Italian roads, without the restrictions associated with public transport. The concept of "public transport" as it pertains to buses, trains, trams, etc., emerged in opposition to this. Even though railways were not inherently public in their legal status, they were intertwined with the notion of shared, collective space, just like streets and neighborhoods, each representing different "degrees of publicity." Trains are thus fully part of the debate about the nature of public space. The late spread of intermodal forms of "public" mobility, such as subways or parking lots near stations, soon led to the "supremacy" of road transport in terms of both passenger and freight transportation. The infrastructure modernization projects were slow, inefficient, and inconsistent.

The 1980s were a turning point from the point of view of the organisation of the railways in Italy. This is the time in which the profound revolutionary transformation of the system began to take root. On 18 April 1985, the law establishing Ente Ferrovie dello Stato as a legal entity was approved: an economic public body endowed with legal personality and patrimonial autonomy that set its own objectives according to 'criteria of economy and efficiency', accepting the logic of entrepreneurship, while respecting the rules of public transport'. The Ministry of Transport retained supervisory and policy-making powers, including the appointment of the Board .
This entailed an important change in the Italian administrative landscape: not only did this reform pave the way for the privatisations of numerous sectors that were to characterise the 1990s, but it constituted the transition from 'public' to 'private' - here considered primarily in economic-legal terms - of what was the company with the highest number of employees, annual budget, real estate capital and investment quotas' (Maggi, 2017, p. 197).
Among the primary objectives, in the context of a prolonged crisis, was to restore the balance sheet: thus began the long period of FS's reorganisation, every interview with workers and former workers conducted during the research begins unconsciously like this: *We were so many now we are less than a third!*[24]. Like a refrain, FS seems to have been running out of steam for decades: your job position

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[24] *Eravamo tantissimi adesso siamo meno di un terzo*

retires with you. The employees - ex-employees and early retirees - were a hybrid: state employee but no more.

> Nel frattempo, comunque la Ferrovia è cambiata, da 220.000 dipendenti è passata a 100.000 (...) Ha scardinato tutte le procedure, ha fatto si che le stazioni venissero abbandonate, con tutte le conseguenze anche sociali (...) discorso che sarebbe da approfondire, ma era un cambiamento necessario ai fini proprio della sopravvivenza delle Ferrovie, che oggi però hanno delle disfunzioni notevoli[25]. Sergio, 69, former manager FS, in Bertuccio - Mello, edited, 2013 p.428

1992 marked the transformation of IRI, ENI, INA and ENEL into an S.P.A[26]., and on 12 August of the same year, Ferrovie dello Stato - Società di trasporto e servizi SPA was born.
The capital remains in the hands of the Ministry of the Treasury, the regulation of the company, directed by an 'autonomously deliberated' statute, in short: private rules and public capital.

In 1999, following a European directive (European Directive 440/1991 effective from 1/1/1993, aimed at the development of 'European' railways, modeled after other means of transport, as railways had never before separated infrastructure management from service operations), the division between the infrastructure manager (RFI) and the service operator took place. Trenitalia primarily operates passenger services, but also Trenord in Lombardy, while freight services are managed by companies such as Mercitalia (formerly Fs). This effectively 'liberalized' access to the infrastructure. From this, RFI and Trenitalia were established, with Ferrovie dello Stato becoming the holding company: the following paragraph will provide a complete overview of the company's operations.

From this point onwards, the railway world took on a dual nature: on the one hand, the liberalization of services, allowing various transport companies to operate, while on the other hand, the infrastructure remains owned and monopolized by RFI, which manages it.

A significant shift occurred in 1997 when regional transport planning and financing were transferred to the regions ('Delegation to regions and local authorities of functions related to local public transport': Legislative Decree No. 422 of 19/11/1997). Through 'service contracts,' the operation of trains was assigned to companies, using the same mechanism as local public transport by road.

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[25] *In the meantime, however, the railway has changed, from 220,000 employees to 100,000 (...) It has changed all the procedures, it has caused the stations to be abandoned, with all the consequences, including social ones (...) This is a subject that needs to be studied in depth, but it was a necessary change for the very survival of the railways, which today, however, have considerable dysfunctions.*

[26] *DL 11 luglio 1992/ n. 33 convertito nella legge n. 359, l'8 agosto 1992.*

The regional passenger train is considered 'a loss-making venture,' for which regions provide compensation for 'the provision of non-profitable services.' The regionalization of local transport led to a strong differentiation of services due to varying funding levels across regions. The competitive lines are those that are profitable by nature: a private company, whether Ntv (Italo) or any other, especially in a launch phase, would have no reason to invest in 'branches' that are drying up on lines whose assets are 'aging.' In 2012, 24% of the railway lines in Piedmont were closed: 11 lines, covering a total of 470 km.

The development and completion of the 'railway revolution'—with travel times halved and the train competing not only with road transport but also with domestic flights—has, in a few years, changed the 'geography of Italy.' This geography is constructed in a differential manner compared to the construction parameters we have considered here: due to space limitations, we have focused only on the cases of Liguria and Piedmont (and partly Lombardy), which constituted an important 'center' in the national landscape of the 19th and 20th centuries. A more comprehensive examination of the production processes across the entire peninsula would likely highlight these imbalances of power more clearly. Regarding the dichotomy between 'public' and 'private' in the railway sector, lexical considerations are necessary to account for the legal status, as it is tied to the debate on privatizations.

The legal status of 'railway companies' appears complex and has been the subject of lively debate since its inception, constituting an important hybrid to this day. Public and political policies related to transport have also been significant in this context.

IL FUTURO SI FONDA SU UNA
GRANDE STORIA

1905

NASCE L'AZIENDA
Il 1° luglio nasce l'Azienda Unitaria delle Ferrovie dello Stato, che sancisce il criterio dell'unificazione dai fabbricati di stazione allo stile delle carrozze: si pensa e si costruisce un unico criterio nazionale.

1927

LA PRIMA DIRETTISSIMA
Insieme alla stazione di Napoli Mergellina viene inaugurata la "direttissima" Roma-Napoli: la prima di questa tipologia, pensata per consentire velocità di marcia sostenute.

1936

IL PRIMO ELETTROTRENO ITALIANO
Nasce il primo elettrotreno tutto italiano, l'ETR 200, che apre la strada all'alta velocità.

1953

IL MITICO SETTEBELLO
Tra Roma e Milano fa la sua comparsa l'ETR 300, subito ribattezzato Settebello, per le sette carrozze che lo compongono. Con la sua forma innovativa è l'emblema della ricostruzione e del design italiano.

1976

NASCE IL PENDOLINO
Nasce il primo elettrotreno a cassa oscillante: l'ETR 401, più noto come Pendolino. Progettato dalle Ferrovie dello Stato e dalla Fiat Ferroviaria per raggiungere i 250 Km/h, il pendolino rappresenta una tappa miliare nel percorso verso l'AV italiana.

1989

IL PRIMO RECORD
Sulla direttissima Roma -Firenze, l'ETR X 500 tocca i 317 Km/h, realizzando il primo record ufficiale riconosciuto dalle Ferrovie dello Stato e migliorato poco tempo dopo dall'ETR Y 500, che raggiunge i 321 Km/h.

1992

PROTAGONISTI NELLA FINANZA
Le Ferrovie dello Stato diventano Società per Azioni.

2000

NASCONO LE SOCIETÀ OPERATIVE
Nel 2000 nasce Trenitalia e un anno dopo Rete Ferroviaria Italiana in risposta alla necessità di separare il gestore della rete dal produttore dei servizi di trasporto.

2005

RIFERIMENTO MONDIALE NELL'AV
Viene completata la nuova linea AV Roma-Napoli, la prima ad adottare l'innovativo sistema ERTMS/ETCS. Per studiare l'opera italiana vengono da tutto il mondo, dal Giappone all'America, passando per la Cina e la Russia. Si viaggia con tranquillità e sicurezza a 300 Km/h.

2008

IL PONTE SUL FIUME PO
Il Gruppo Ferrovie dello Stato consegna al Paese la linea AV fra Milano e Bologna. Tra le opere realizzate, uno straordinario ponte strellato sul fiume Po. Sulla nuova linea si raggiunge il nuovo record di velocità italiano: 362 Km/h.

2009

SI COMPLETA L'ASSE AV
Con l'apertura della Bologna-Firenze, una linea praticamente tutta in galleria, e della Novara-Milano, si completa l'asse AV da Torino a Salerno. Mille chilometri di linee ad alta velocità che accorciano il Paese e modificano le abitudini di mobilità degli italiani.

2011

IL PODIO ANCHE IN GERMANIA
FS Italiane acquisisce il Gruppo Arriva Deutschland, oggi chiamato Netinera: il terzo operatore nel settore del trasporto passeggeri in Germania.

2015

UN NUOVO RECORD DI VELOCITÀ
Il treno "Frecciarossa 1000" ha raggiunto un nuovo record di velocità: 390,7 Km/h.

2017

ANAS NEL GRUPPO FS
Il Gruppo Ferrovie dello Stato Italiane diventa il primo polo integrato di ferrovie e strade in Europa per abitanti serviti e investimenti.

2019

DIECI ANNI DELL'AV E SVOLTA NEL REGIONALE
Un modello di Alta Velocità che il Gruppo esporta nel mondo. Rinnovo dell'80% dell'intera flotta regionale: debuttano i primi treni Rock e Pop, riciclabili fino al 97%.

2020

FS ACCELERA SULL'INTERNAZIONALIZZAZIONE
Fs sbarca con l'AV in Spagna, dopo Inghilterra, Francia, Germania, Olanda e Grecia. Con 9 miliardi di investimenti tecnici in Italia, FS è il primo gruppo industriale del Paese.

2022

PIANO INDUSTRIALE 2022-2031
190 miliardi per uno sviluppo sostenibile di infrastrutture e mobilità al servizio del Paese.
#Untemponuovo

Figure 12: Main milestone of Ferrovie dello Stato Group history. Source FS Italiane[27]

6.2 RAYLWAY SECTOR STRUCTURE IN ITALY
6.2.1 Structure and Organization of the Ferrovie dello Stato Group

Analyzing and understanding the organization of a company in continuous transformation, within a framework where the actors are constantly changing, is not an easy task. To provide greater clarity, below is a summary of organizational and structural information about the company today, as presented on its official websites.

«The Ferrovie dello Stato Italiane Group is one of the largest industrial enterprises in the country» and it is a company "100% owned by the Ministry of Economy and Finance since 1992", In 2019 contrlled 16 operational companies in the four core sectors of the "supply chain": 1) transport, 2) infrastructure, 3) real estate services, 4) other services (fig. 15,16). Each company has "autonomous legal responsibilities" and "carries out corporate activities typical of a holding company (management of equity holdings, shareholder control, etc.), as well as industrial-type activities. The Central Departments are the mechanism through which the principal company defines «the strategic lines and ensures the direction and coordination of the industrial policies of the operating companies». With the new business plan[28] (2022 - 2031), a new organizational structure centred on four business poles is affirmed: 1) Infrastructure pole *Backbone for economic and social development of the territory*, 2) Passenger pole *Integrated solutions for sustainable mobility* 3) Logistics pole *The entire digitized goods supply chain* 4) Urban pole *The sustainable regeneration of cities*.

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[27] https://www.fsitaliane.it/content/fsitaliane/it/il-gruppo-fs/la-nostra-storia.html last visit 28/9/24

[28] https://www.fsitaliane.it/content/fsitaliane/it/il-gruppo-fs/il-piano-industriale-2022-2031-e-i-quattro-poli-di-business.html (last visit: 28/9/2024)

Figure 13: FS Group Operating organigram (2019)

Figure 14: The map of Italian State Railways' sectors and shareholdings, updated to February 2023. SOURCE: Sustainability report, FS Group (2023 p. 18)

FS Group employs 92,000 people and it is at the center of a big generational change (fig. 15 and table 23) after the strong drop shown above. In 2023, 12148 recruitments are recorded compared to 6026 retirements.

Trend assunzioni e cessazioni

2023: Assunzioni 12.148 — Cessazioni 6.026
2022: Assunzioni 9.317 — Cessazioni 6.232
2021: Assunzioni 8.680 — Cessazioni 6.754

● Assunzioni ● Cessazioni

12.148
Assunzioni da mercato
Forme contrattuali
- **48,3%** Tempo indeterminato
- **33,3%** Apprendistato professionale
- **18,3%** Tempo determinato
- **0,1%** Altri contratti

41 anni età media
- 1 anno rispetto al 2022

Distribuzione del personale per classi di età

2023: 0,8% | 24,6% | 23,4% | 21,7% | 20,4% | 9,1%
2022: 0,7% | 22,6% | 22,5% | 22,3% | 21,8% | 10,0%
2021: 0,7% | 20,8% | 21,8% | 22,4% | 24,6% | 9,6%

● Fino a 20 anni ● Da 21 a 30 anni ● Da 31 a 40 anni
● Da 41 a 50 anni ● Da 51 a 60 anni ○ Oltre 60 anni

Figure 15: Employs trends Ferrovie dello Stato Group. Source: Sustainability report (2023) p.148

CONSISTENZE DEL PERSONALE DEL GRUPPO	Unità di misura	2023	2022	2021
Dirigenti	n.	1.162	1.070	998
donne	n.	320	271	237
uomini	n.	842	799	761
Quadri	n.	13.871	12.936	12.285
donne	n.	3.475	3.091	2.743
uomini	n.	10.396	9.845	9.542
Impiegati	n.	45.420	41.692	39.934
donne	n.	12.687	11.141	10.386
uomini	n.	32.733	30.551	29.548
Operai	n.	31.993	29.663	28.689
donne	n.	2.688	2.528	2.261
uomini	n.	29.305	27.135	26.428
Consistenza totale al 31 dicembre	n.	92.446	85.361	81.906
Incidenza donne	%	21%	20%	19%
Incidenza uomini	%	79%	80%	81%
Consistenza media annua	n.	89.398	82.998	81.365

Table 23: Source: Sustainability report (2023 p. 148)

The company operates overall more than 9,700 trains daily (around 8,000 in Italy and over 2,000 abroad), transports approximately 750 million rail passengers annually (600 million in Italy and 150 million abroad), 300 million bus passengers, and 50 million tons of goods per year.

The railway network managed by Rete Ferroviaria Italiana spans over 16.782 km (Table 24 and table 25), including 6,468 km (38.5%) of core lines, 9,364 km (55.8%) of complementary lines and 950 km (5.7%) of junction lines. Compared to 2016, the overall extent of the railway network remained almost unchanged, while it increased by approximately 100 km (Mims 2021). In general (graph 15, 16), the average Italian total infrastructure per inhabitant (per surface area) of 283 km/million inhabitants (56 km/thousand square kilometres), with values varying between regions from a minimum for Lombardy (Sardinia) of 175 km/million inhabitants (18 km/thousand square kilometres) to a maximum for Molise (Liguria) of 894 km/million inhabitants (91 km/thousand square kilometres). Regarding railway infrastructures distribution by type of line, the Italian average is 109 km/million inhabitants (21 km/thousand square kilometres), with values varying among the regions from a minimum for Sicily, Valle d'Aosta and Sardinia, which do not have a fundamental network, to a maximum for Umbria (Liguria) of 310 km/million inhabitants (57 km/thousand square kilometres). Looking at the railway infrastructures by number of tracks, the average Italian double-track network per inhabitant (per surface area) of 130 km/million inhabitants (26 km/thousand square kilometres), with values varying among the regions from a minimum for Valle d'Aosta, equipped with an exclusively single-track network, to a maximum for Friuli-Venezia Giulia (Liguria) of 249 km/million inhabitants (61 km/thousand square kilometres).

The Italian railway network, moreover, counts around 2,200 stations (fig.18) throughout the country, through which approximately 1.4 billion travelers pass each year (2019). According to MIMS data (2021 p.40[29]) more than 20% of the Italian population lives less than 15 minutes away from a railway station, thus enhancing the role of the station, from a simple intermodal interchange node to a true "nerve" center of urban mobility, fully integrated in the urban ecosystem and a hub of services (commerce, leisure, health, culture, etc.) with flexible spaces that allow for flexibility of use.
In addition, the percentage of population who live or work less than 3 km from a train stop exceeds 50 per cent (15 minutes by bike or even less if the journey to the station is made by public transport or a shared vehicle). Also within 3 km of stations are the majority of secondary schools (51%), universities (83%) and hospitals (59%). For all these reasons, it is therefore of key importance to ensure that stations are effectively connected.

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[29] https://www.mit.gov.it/nfsmitgov/files/media/notizia/2022-01/Documento%20strategico%20ferrovie.pdf

Nevertheless, the national framework of the presence and typology of stations is differentiated by regions: fig 19 show a summary of this aspect the regional detail of the typology of stations.

However, according to the same data, with reference to the transport offer, the railway infrastructure in Italy shows a gap compared to other European countries in terms of density in relation to the population, both with respect to the overall network and to the HS rate alone (-38.6% and -58.3%, respectively, compared to the EU average) (fig. 18). On the other hand, however, the Italian network shows a higher degree of electrification (+16 percentage points compared to the EU average).

Table 24: Development of the Italian railway network by type of line. Source: Mims 2021 p. 43 on data CNIT and RFI

RETE FERROVIARIA		2020	2019	2018	2017	2016	2015	2014
LINEE FONDAMENTALI (a)	km	6.468	6.468	6.469	6.497	6.367	6.442	6.449
	%	38,5%	38,5%	38,5%	38,7%	37,9%	38,5%	38,6%
LINEE COMPLEMENTARI (b)	km	9.364	9.361	9.360	9.337	9.466	9.339	9.331
	%	55,8%	55,8%	55,8%	55,6%	56,4%	55,8%	55,8%
LINEE DI NODO (c)	km	950	950	952	953	955	943	943
	%	5,7%	5,7%	5,7%	5,7%	5,7%	5,6%	5,6%
TOTALE	km	16.782	16.779	16.781	16.787	16.788	16.724	16.723

(a) comprendono le direttrici internazionali e gli assi di collegamento fra le principali città italiane; (b) costituiscono la maglia di collegamento nell'ambito dei bacini regionali e connettono tra loro le direttrici principali; (c) si sviluppano all'interno di grandi zone di scambio e collegamento tra linee fondamentali e complementari situate nell'ambito di aree metropolitane.

LINEE COMPLEMENTARI		2020	2019	2018	2017	2016	2015	2014
LINEE SECONDARIE (d)	km	n.d.	6.804	6.802	6.779	6.907	6.780	6.771
	%	n.d.	40,6%	40,5%	40,4%	41,1%	40,5%	40,5%
LINEE A SCARSO TRAFFICO (e)	km	n.d.	2.318	2.319	2.319	2.323	2.319	2.319
	%	n.d.	13,8%	13,8%	13,8%	13,8%	13,9%	13,9%
LINEE A SPOLA (f)	km	n.d.	239	239	239	236	240	241
	%	n.d.	1,4%	1,4%	1,4%	1,4%	1,4%	1,4%
TOTALE	km	n.d.	9.361	9.360	9.337	9.466	9.339	9.331

d) caratterizzate da traffico contenuto; (e) localizzate in aree a domanda strutturalmente debole; (f) linee sulle quali vengono effettuati servizi a/r con una certa frequenza senza intersezione di tracce in località intermedie.

LINEE FERROVIARIE IN ESERCIZIO RFI	16.832 km[77]
CLASSIFICAZIONE	
Linee fondamentali	6.460 km
Linee complementari	9.422 km
Linee di nodo	950 km
TIPOLOGIA	
Linee a doppio binario	7.734 km
Linee a semplice binario	9.098 km
ALIMENTAZIONE	
Linee elettrificate	12.205 km
- a doppio binario	7.658 km
- a semplice binario	4.547 km
Linee non elettrificate (diesel)	4.627 km
LINEE FERROVIARIE IN ESERCIZIO FSE	474 km
LINEE FERROVIARIE IN ESERCIZIO NETINERA	300 km

Table 25: Railways lines operated by RFI. Source: Sustainability report (2023 p. 108)
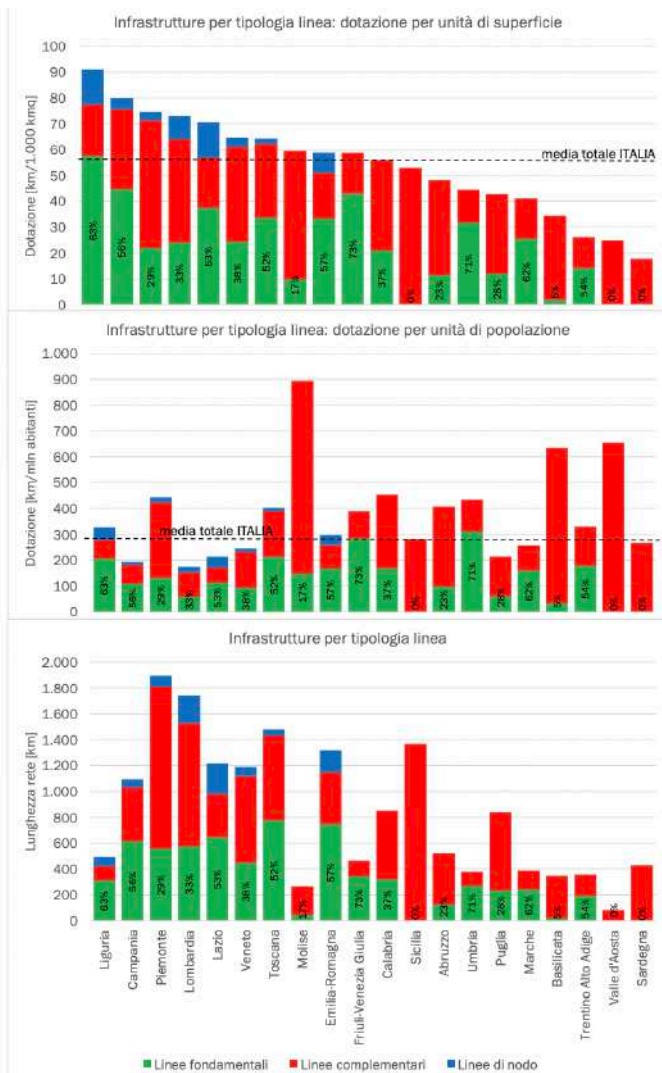
Graph 15: Railway infrastructure by type of line (2020). Source: Mims 2021 p. 45 on RFI data

284
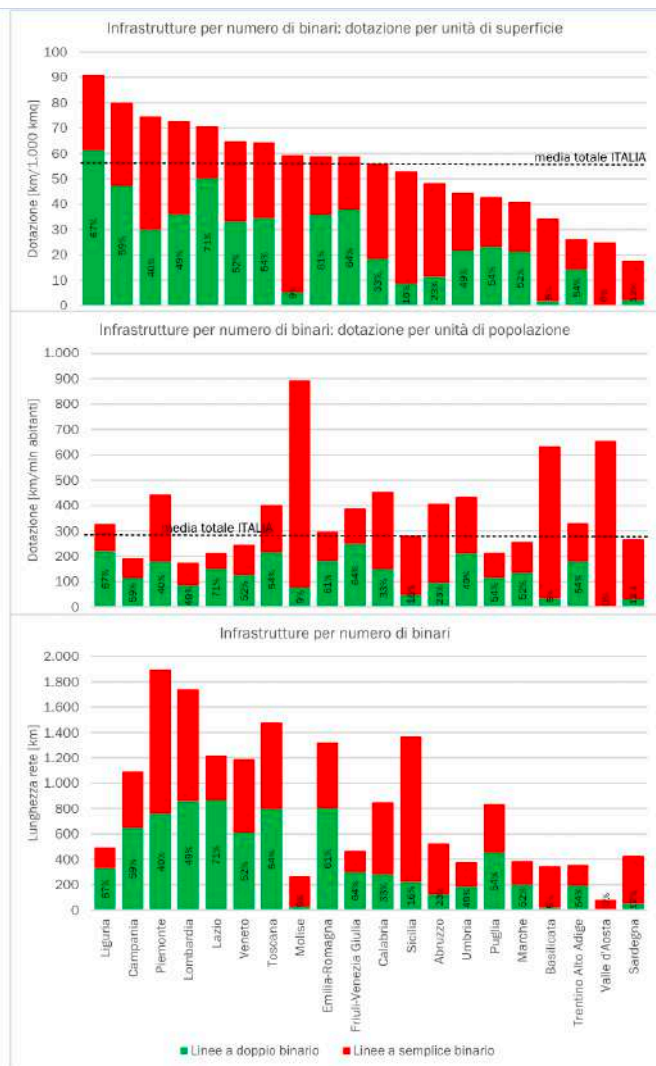
Graph 16: Railway infrastructure by type of power supply (2020) Source: Mims 2021 p. 46 on RFI data

Figure 16: Total of the railway station per typology in Italy (2020). Source: Mims (2021 p. 41) on data ISTAT (2021)
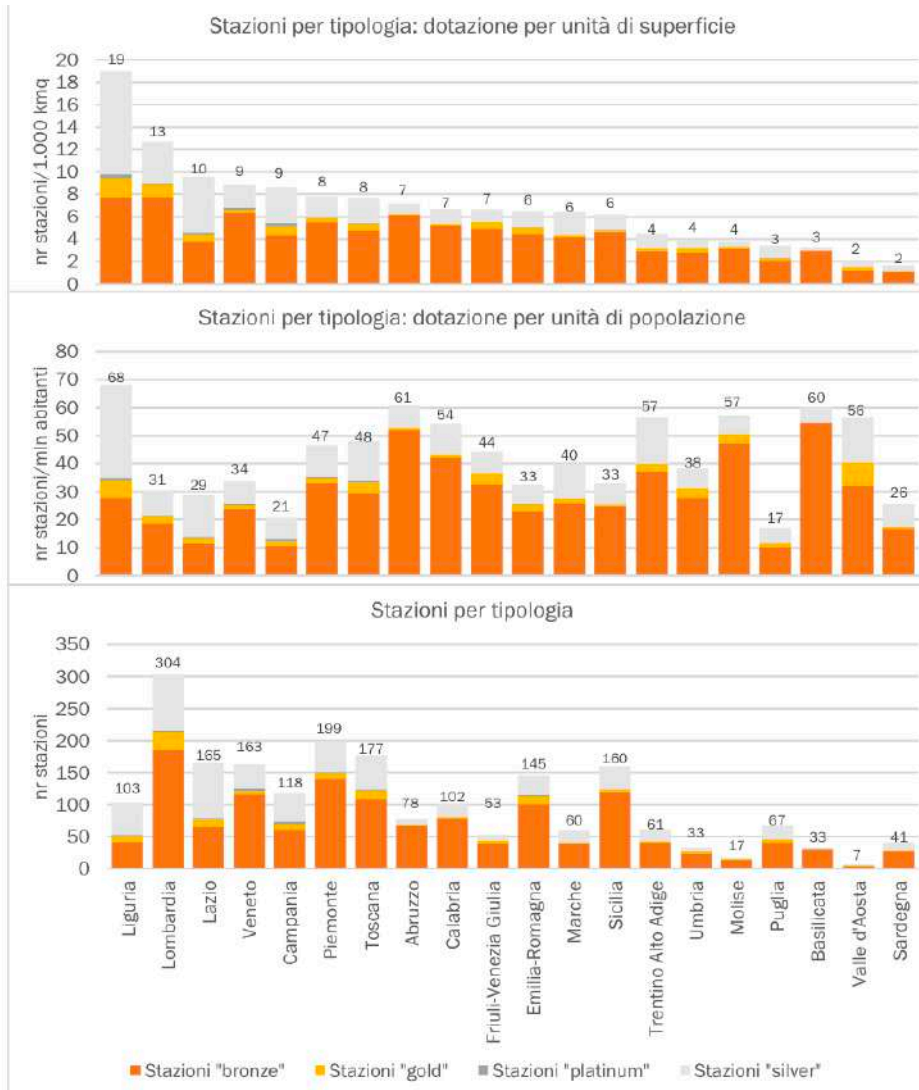
Figure 17: Railway station per typology and regional distribution (2020). Source: Mims 2021 p. on data ISTAT (2021)
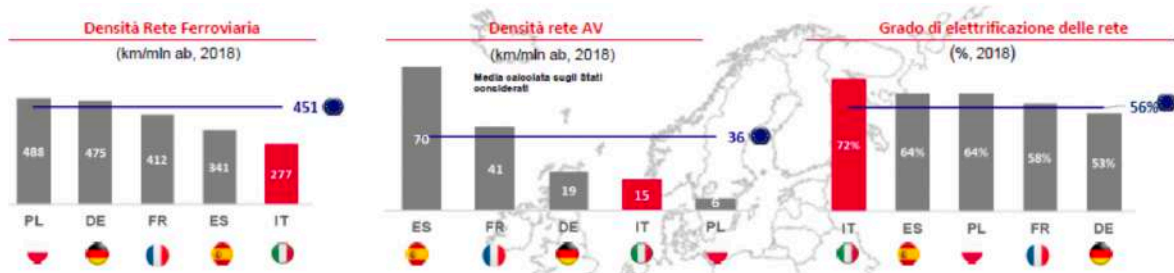
Figure 18: Railway networks in Europe (2018). Source: MIMS (2021 p. 40) on RFI data

Map 36: Ferrovie dello Stato network in operation. Source: RF

28/09/2024

Istantanea sulla rete

———— Rete Fondamentale AV/AC(ERTMS)

———— Rete Fondamentale Tradizionale

———— Rete Complementare

———— Nodi

1:8,177,064
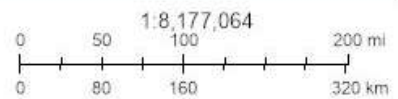
Esri, TomTom, Garmin, FAO, NOAA, USGS

Map 37

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To sup up, the goal of the FS Italiane Group is to become "the system enterprise" encompassing commuter services and "high-speed train users," enhancing mobility and logistics performance through the synergy of transport infrastructures. (The group's mission is to have "actively contributed to the progress of the country for over a hundred years," focusing on the mobility needs of "young people, families, and workers" in "a rapidly changing and evolving society, which is accelerating while simultaneously striving to stay connected through increasingly faster and more efficient systems."

The passenger is always at the center of every decision-making process: territorial coverage, punctuality, safety, and comfort are strategic objectives, while the core business "consists of the safe, comfortable, and efficient transport of millions of people." The aim is to "maximize" the level of the High-Speed offer and "improve the standards of local transport" for the 451 million out of a total of 520 million passengers who annually choose regional services. The transport projects and services are ways of creating long-term value for the community "in a lasting way" through direct investments in trains, which must become increasingly comfortable and "high performing." These key focus areas will guide the company's actions: customer at the center; integrated mobility, intermodality, digitalization, and sustainability, aligning with broader European green and digital transitions[30].

6.2.2 NETWORKS AT DIFFERENT SPEEDS

L'Alta velocità/Alta Capacità: l'eccellenza italiana:
Aumentare la quantità e la qualità e dell'offerta ferroviaria italiana e l'integrazione con la rete europea, contribuire al riequilibrio del sistema dei trasporti nazionale oggi fortemente squilibrato a favore della strada: sono questi i fondamentali obiettivi dell'Alta Velocità/Alta Capacità italiana[31].

Since its launch in 2009, high-speed rail in Italy has been at the center of the strategic interests of the Ferrovie dello Stato group, as well as of public and scientific debate. It represents the most visible and tangible multi-level transformation of the railway transformation process in Italy and Europe

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[30] https://www.fsitaliane.it/content/fsitaliane/it/il-gruppo-fs/il-piano-industriale-2022-2031-e-i-quattro-poli-di-business.html (last visit 28/09/2024)

[31] Eng: High Speed/High Capacity: Italian excellence: Increasing the quantity and quality and of the Italian railway offer and integration with the European network, contributing to the rebalancing of the national transport system which is today strongly imbalanced in favour of road: these are the fundamental objectives of the Italian High Speed/High Capacity. Source: RFI

mentioned in the previous paragraph. Given its crucial role in the railway system and in redesigning related territorial processes, this paragraph provides a general overview of the high-speed rail system in Italy.

With the first achievement of the high-speed rail axis in 2009 between Turin and Salerno, what has been termed a "railway revolution" (Maggi 2017, p. 185) was achieved. This revolution not only halved travel times but also completely recalibrated the perception and parameters of distance, as well as travel figures, both from the user's perspective and within the various railway sectors.

This process unfolds on multiple intertwined levels, beginning with the long and complex reorganization of Ferrovie dello Stato mentioned in the previous paragraph, starting with the "liberalization" of railway transport and the "privatization" of the entity in the mid-1980s. This continued through the separation between the network operator (RFI) and the service provider (Trenitalia) in the early 2000s, and finally the transfer of regional transport management to the regions via "service contracts."

The transformation of the Italian railway sector is part of a broader, long-term European framework. The implementation of high-speed rail in Italy is, indeed, connected to the bicentennial project (Shipper, Schot 2011) of creating a European railway network capable of connecting the continent's major metropolitan hubs. This initiative fosters European integration, supports "economic growth" and the "competitiveness" of the Mediterranean basin (Sellari 2013), and allows a new user population to move freely and quickly across international space. TEN is the acronym for Trans European Network, a program established by the European Union with the goal of «bringing peripheral regions of the Union closer to the community core and integrating the various national networks into a unified framework» (Sellari 2013, p. 100). European transport policy is summarized by five key words (ibidem): liberalization, environment, infrastructure, common technological standards, and pan-European corridors.

The implementation of the TEN-T network reshapes the community's infrastructural space, outlining a Europe of cities, of «large, interconnected metropolises», according to the declared aims, a European network aimed at global competition, improving mobility services and their accessibility to travelers and goods, and contributing to territorial and "community" cohesion.

High-speed rail represents an innovative element in the (re)structuring of relationships between cities and within the city, rendering urban boundaries mobile. The expansion (and contraction) of

possibilities, the production of new centralities, and the modification of historical axes are some of the dynamics inherent in high-speed rail processes.

Of the nine corridors that constitute the backbone of the Trans European Network-Transport (Map 3) , four involve Italy, crossing it from north to south and from west to east: the Baltic-Adriatic, the Scandinavian-Mediterranean, the Rhine-Alps, and the Mediterranean. On the national sections of the four corridors, RFI, along with other European infrastructure managers and with financial support from the European Union, develops investments and projects aimed at ensuring, by 2030, the enhancement, efficiency, and adaptation of infrastructure to the parameters of "interoperability." The creation and development of TEN networks aim at the interconnection of national infrastructural networks, ensuring their interoperability through interventions based on the definition of common standards for the removal of technical barriers. Historically, the "integrative potential of infrastructures" (Shipper, Schot 2011) has been highlighted, not only from the perspective of "enabling flows and facilitating intercontinental interdependencies," but also from that of constructing "imagined communities," where ideals are aligned with a sense of belonging. The stages of European infrastructural "convergence," defined by Shipper and Schot as "infrastructural Europeanism" (2011), are delineated as a complex and not always linear process in which will, actors, economy, and politics constantly alternate.

The political objective of building an infrastructurally unified Europe, though present, has often intersected with the need to manage "cross-border flows of people, goods, information, or energy" (ibid., p. 251), responding not so much to political ambitions to accelerate European integration as to the everyday economic problems faced by international enterprises. Thus, a "European landscape" has emerged, materially constituted by communication, transport, and energy infrastructures, and symbolically by the discursive practices that, since the 1990s, have depicted Europe as a "frictionless society" of people, goods, services, capital, and merchandise moving freely. It becomes clear that, although projects related to European infrastructure have a shared history, «different Europes are being built at the same time» (Shipper and Schot 2011), and that the very notion of Europe appears as a complex geographical reference.

It is also important to note (Pennati, Garavaglia, Perulli in Balducci, Fedeli, Curci, eds., 2017) that "corridors" and the "TEN-T network" are not the same issue: ten multimodal corridors were defined, constituting "real traffic routes," and these refer not only to a line but to a complex infrastructural system, partly already built, aimed at facilitating exchanges along territorial axes. The launch of the TEN project was characterized by four key concepts: cohesion, polycentrism, missing connections,

and bottlenecks. These are underpinned by Regulation (EU) No. 1315/2013, which establishes the guidelines for developing "trans-European transport networks" through a dual-layer network: a core network with a target deadline of 2030 and a "comprehensive" network to be completed by 2050, with transnational multimodal corridors, for example through the navigability of rivers such as the Rhine or the Po, intersecting to create a dense connective fabric between different European regions and between major port and airport terminals, with the goal of increasing the efficiency and sustainability of transport systems, their capacity to contribute to territorial and community cohesion, and improving mobility services and their accessibility to travelers and goods[32].

In line with the infrastructure planning in the framework of the European TEN-T networks and the new infrastructures realized in recent years, at the national level the National Integrated Transport System (SNIT) was defined within the General Transport and Logistics Plan (GTP) of 2001 and subsequently updated in the Infrastructure Annex to the DEF of 2021. This is divided into a first and a second level and represents the set of infrastructures, both punctual and networked, of national and international interest that constitute the backbone of the Italian passenger and freight transport system. The punctual (nodal) infrastructures are represented by the main ports and airports, as well as metropolitan cities, which constitute the poles of attraction/exit for the multimodal mobility demand of passengers and goods. The network is completed by the linear infrastructures of national and international interest (railways, roads, motorways and cycle paths) which enable the demand for medium and long-distance passenger and freight mobility to be expressed throughout the territory.

The national railway system is not limited to the first-level SNIT, which forms its backbone, but also includes networks (partly managed by RFI, partly by regional operators) and the corresponding local railway services, which, though under regional jurisdiction, collectively provide indispensable support for modal rebalancing in large urban areas, as well as in the extensive urbanized systems that cover much of the national territory.

Indeed, it is well known that stable and high-quality railway services play a significant role in attracting demand and encouraging residential decentralization toward outer areas. The regional

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[32] Il Sistema Nazionale Integrato dei Trasporti (SNIT) di 1°livello per la rete ferroviaria di rilevanza nazionale e internazionale è stato definito nel Piano Generale dei Trasporti e della Logistica (PGTL) del 2001 e successivamente aggiornato nell'Allegato infrastrutture al DEF del 2021 tenendo conto: dell'evoluzione dei traffici di lunga percorrenza (passeggeri e merci); dell'articolazione funzionale dei quattro corridoi TEN-T che interessano il territorio italiano; delle esigenze di collegamento alle principali aree urbane del Paese; degli obiettivi di connessione ai porti e agli aeroporti appartenenti alla medesima rete TEN-T. Il Sistema include 48 direttrici funzionali (figura seguente), estese su circa 8.800 km, pari al 44% dell'intera rete nazionale. Tutte le restanti linee, incluse quelle concesse (isolate o meno), formano invece lo SNIT di 2° livello, orientato prevalentemente al supporto dei traffici regionali e/o alla distribuzione capillare della circolazione merci.

concession railways extend over approximately 3,600 km of track (the national railway network managed by RFI spans about 17,000 km), managed by 20 regional infrastructure operators, some of whom also act as railway service operators. The regulatory framework concerning regional railways, which involves direct participation from RFI, is governed by Article 47 of Decree-Law No. 50 of April 24, 2017, converted into Law No. 96 of June 21, 2017. This allows Regions and regional operators to sign agreements with RFI, enabling the latter to carry out enhancement, modernization, and safety improvements on the lines, as well as to take over infrastructure management, with the possibility of transferring ownership of the railway assets to RFI.

Map 38: Railway network of "national interest" – I and II level SNIT. Source: Documento strategico della mobilità ferroviaria di passeggeri e merci. MIMS 2021 p. 21

Figure 19:First level SNIT. Source: Connettere l'Italia. Allegato DEF 2017 p. 76[33]

Given the profound impact of high-speed rail on the long-distance rail service system, key information regarding active services integrating high-speed "business" rail, "basic" offerings, and "universal service" offerings is provided in the boxes below cited from the RFI business plan (2023)[34].

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https://www.dt.mef.gov.it/export/sites/sitodt/modules/documenti_it/analisi_progammazione/documenti_programm
atici/def_2017/Allegato_3_AL_DEF_217.pdf Last visit 30/09/2024

34 https://www.rfi.it/it/chi-siamo/Il-rapporto-con-lo-Stato-e-con-gli-stakeholder/il-piano-commerciale.html last visit
29/9/2024

LA RETE FERROVIARIA NELLE REGIONI

Regione	Km binario doppio	Km binario semplice	% binario semplice	Km elettrificati	Km non elettrificati	% non elettrificati	Totale km rete	Numero stazioni/fermate	Km rete con sistema SCMT	Km rete con sistema SSC	Km rete con doppio sistema SCMT-S-SC
Abruzzo	123	553	81,8	470	206	30,5	676	96	315,5	206	0
Basilicata	18	446	96,1	211	253	54,5	464	55	211,2	135,6	0
Calabria	279	686	69,6	488	477	49,4	965	143	851,8	0	0
Campania	736	647	46,9	1.176	207	15	1.383	282	803,1	197,1	0
Emilia-Romagna	804	875	52,1	1.420	259	15,4	1.679	240	1.023	50,5	0
Friuli-Venezia Giulia	299	182	37,8	382	99	20,5	481	56	426,2	37,1	0
Lazio	1.008	348	25,7	1.253	103	7,6	1.356	229	974,7	102,7	0
Liguria	334	159	32,2	476	17	3,4	493	101	477	0	0
Lombardia	859	881	50,6	1.457	283	16,3	1.740	297	1.398,8	113,6	5,3
Marche	201	184	47,8	267	118	30,6	385	60	357	31,6	0
Molise	23	242	91,3	77,5	187,5	70,7	265	19	118,5	146,3	0
Piemonte	781	1157	59,7	1.412	525	27,1	1.938	197	1.270,9	397,2	20,1
Puglia	929	613	39,7	881	661	42,8	1.542	189	708,9	133,7	0
Sardegna	50	549	98,2	0	599	100	599	91	365,4	60	0
Sicilia	223	1.267	85	801	689	46,2	1.490	187	1.123,2	246,7	0
Toscana	794	769	49,2	1.060	503	32,2	1.563	198	1.066,7	213,8	0
Trentino-Alto Adige	193	287	59,8	353	127	26,5	480	118	356,2	0	0
Umbria	183	345	65,3	502	26	4,9	528	79	312,6	20,7	0
Valle d'Aosta	0	81	100	0	81	100	81	7	0	81,4	0
Veneto	612	633	50,8	904	341	27,4	1.245	184	977,1	112,1	0
Totale	8.449	10.904	56,3	13.590,5	5.761,5	29,77	19.353	2.828	13.137,8	2.286,1	25,4

Nota: i km con sistema di sicurezza sono riferiti alla rete gestita da RFI

Legambiente, rapporto Pendolaria 2024

Table 26: Pendolaria 2024 p. 45

Regarding the number of passengers specifically of High Speed, according to the Ministery of Infrastructure and Trasport (2016): Trenitalia further increased its high-speed rail (HSR) passenger traffic in 2012 and 2013, reaching approximately 24.5 million passengers per year, despite the entry of the newcomer NTV into the market that quite radically changed the market conditions in Italy (Beria et al 2016). Italo carried around 4.5 million passengers in 2012 and reached a total of 20.1 million passengers in 2019. In short, passengers carried on Trenitalia's high-speed trains increased from 6.5 million in 2008 to 40 million in 2019, an increase of 515%, and in 2022 an increase of 110% compared to the decidedly declining numbers of the 2020-2021 pandemic period.

The growth of High Speed is largely due to the increase in the high-speed train fleet, which grew from 74 trains in 2008 to 188 in 2023, alongside significant investments such as the recent order exceeding one billion euros for the supply of 40 new Frecciarossa ETR 1000 trains for Trenitalia. The overall growth is partly due to the shift from other modes such as air and car especially along the Naples-Milan-Turin and Rome-Bologna-Venice routes, as well as from other rail services (intercity). Growth is also due (40%) to the considerable amount of new travellers and new trips generated by reductions in travel time and costs (induced demand). The number of HS-induced trips is estimated at 5.5 million passengers per year. This development of HS services also has important repercussions on the modal split: on the Rome-Milan route it is estimated that between 2008 and 2014 the rail share increased from 6% to 65% against a decrease in air (from 50% to 24%) and road (from 14% to 11%) (Pendolaria 2024; MIMS 2016). To sum up, as mentioned in the ministerial reports (MIMS 2021)

The presence of High-Speed train has radically changed the landscape of the long-distance rail transport sector. In fact, over the last ten years, since the continuous growth of services on the High Speed/High Capacity network, the long-distance sector has been the protagonist of a profound transformation in people's lifestyles and work and in mobility in the country. High-speed rail has reduced distances, shortening the country and bringing citizens closer together, with important effects on the national economy (GDP and employment), on the evolution of the transport system, on tourism, and on the real estate market in urban centres. And with benefits for the environment, linked to the reduction of CO_2 emitted into the atmosphere thanks to the modal shift from private cars and flights.

Nevertheless, as crucially understood high speed can't be capillary by definition. Following figures (25) allow a gaze and an understating on the main changes and waves that regard a long distance rail traffic "at different speed" and show the extent of the change in the demand for rail long distance mobility. Between 2000 and 2010, medium- and long-distance rail traffic decreased by more than 25%, a trend that was reversed starting in 2012, thanks above all to the competition created in the high-speed market, which generated an increase of more than 9% in the 2012-2019

period. National rail services have thus undergone a substantial transformation, going from being a key element for the country's connectivity over long and very long distances to a carrier system for medium- to long-distance relations. Regional traffic has experienced a trend that to some extent mirrors the previous one, characterised between 2000 and 2010 by a rather consistent growth (+16%), followed by a considerable drop (-15.5%) in the following decade (2010-2019). More specifically, the years immediately following the economic crisis of 2009 saw significant reductions in passenger traffic. Between 2009 and 2012, in fact, the number of passenger journeys decreased by about 15%, a reduction that affected the different modes to different degrees, from rail transport (-3%) to road transport (-16%), passing through maritime transport (-14%), with only air transport having withstood the crisis, registering a growth of 13% in the same period. Since 2013, there has been a recovery in passenger mobility, thanks in part to the activation of high-speed rail services and the opening up (in 2012) to free competition on rail services: this has resulted in an almost continuous rise, with average increases of 3% per year, in total travel, leading in 2019 to overall demand returning to pre-crisis levels in 2009, only to collapse due to the pandemic (MIMS 2021).

SETTORE	SISTEMA DI TRASPORTO		2020	2019	2018	2017	2016	2015	2010	2005	2000
TRASPORTO FERROVIARIO	FERROVIA (piccole/medie e grandi imprese)	Mln pax-km	21.206	56.586	55.493	53.231	52.178	52.207	47.172	50.088	50.243
		%	82,3%	87,1%	87,2%	87,3%	87,3%	87,7%	86,3%	88,6%	89,4%
	METROPOLITANA	Mln pax-km	3.307	6.052	5.853	5.562	5.388	5.527	5.948	4.982	4.503
		%	12,8%	9,3%	9,2%	9,1%	9,0%	9,3%	10,9%	8,8%	8,0%
	TRANVIA (urbana ed extraurbana)	Mln pax-km	911	1.644	1.506	1.466	1.435	1.379	1.207	1.103	1.105
		%	3,5%	2,5%	2,4%	2,4%	2,4%	2,3%	2,2%	2,0%	2,0%
	FUNIVIA e FUNICOLARE	Mln pax-km	351	693	751	749	767	431	349	344	331
		%	1,4%	1,1%	1,2%	1,2%	1,3%	0,7%	0,6%	0,6%	0,6%
TOTALE		Mln pax-km	25.775	64.975	63.603	61.008	59.768	59.544	54.676	56.517	56.182
		var. % su base annua	-60,3%	2,2%	4,3%	2,1%	0,4%	1,8%	-0,7%	0,1%	1,5%

Table 27: Trends in domestic passenger demand in rail transport 2000 - 2020. Source: MIMS 2021 p. 31
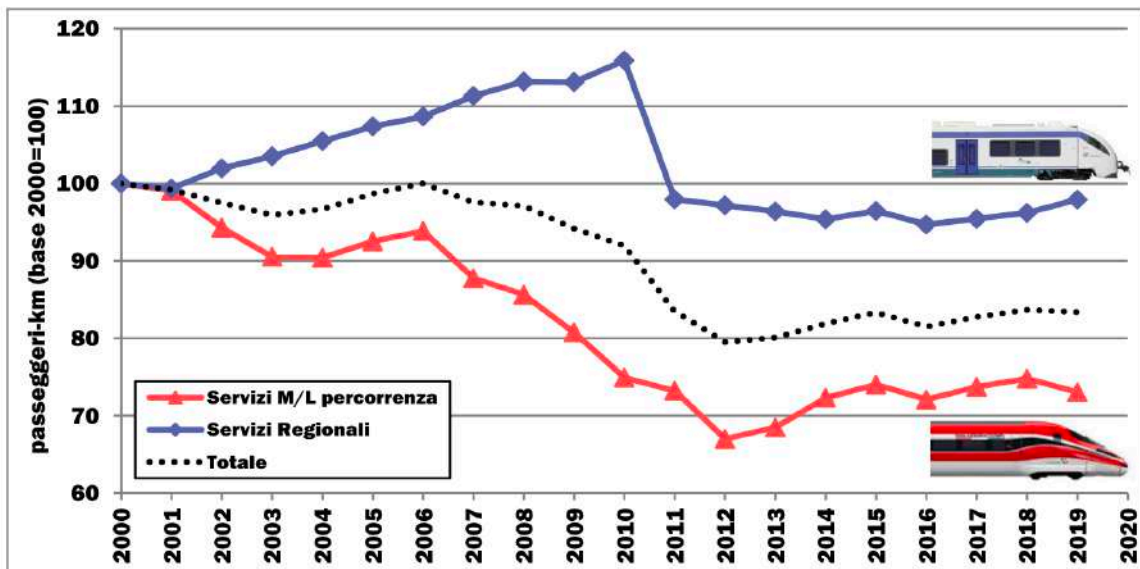
Table 28: Trends in medium- and long-distance and regional rail traffic 2000 - 2019 (base index 2000 = 100). Source: Mims (2021 p. 31)

However, against the considerable growth in business long-distance transport, the same results did not occur on the other 'secondary' national lines, where Intercity trains run. This has generated (Pendolaria 2024) the risk of a decrease in travel possibilities in those territories where there is no high-speed service. In fact, for publicly financed long-distance trains, the offer in terms of trains*km dropped from 2009 to 2020 by almost a third. In recent years, there has been a recovery in supply thanks to the new 10-year contract signed in 2017, after a period of extension of the previous one, which sets out the resources to be allocated (347 million in 2017 and 365 million per year for the following years). These resources made it possible to recover only part of the cuts made in 2010, with consequences in terms of passengers. The need for trains on these long-distance routes is fundamental and still present for medium and long-distance connections between provincial capitals. According to Legambiente (Pendolaria 2024), additional resources need to be found to enhance the offer on national lines outside the high speed, such as the Tyrrhenian and Adriatic, the connections in the north-east and north-west, and those on the country's transversal lines, with a project to systemise the connections with ports and interports. PNRR provides for the financing of 200 million euro for the purchase of new Intercity trains, particularly for the southern regions Also worth mentioning is the completion of the revamping of the carriages of Intercity trains in circulation, with more comforts such as a lounge configuration, large and comfortable seats, electric sockets in the seats, and other work in progress and planned until 2026 with, for example, improvements to air conditioning and the

operation of door lateralisation, in addition to investments for legal adaptations such as upgrades to the ERTMS system on locomotives and carriages.
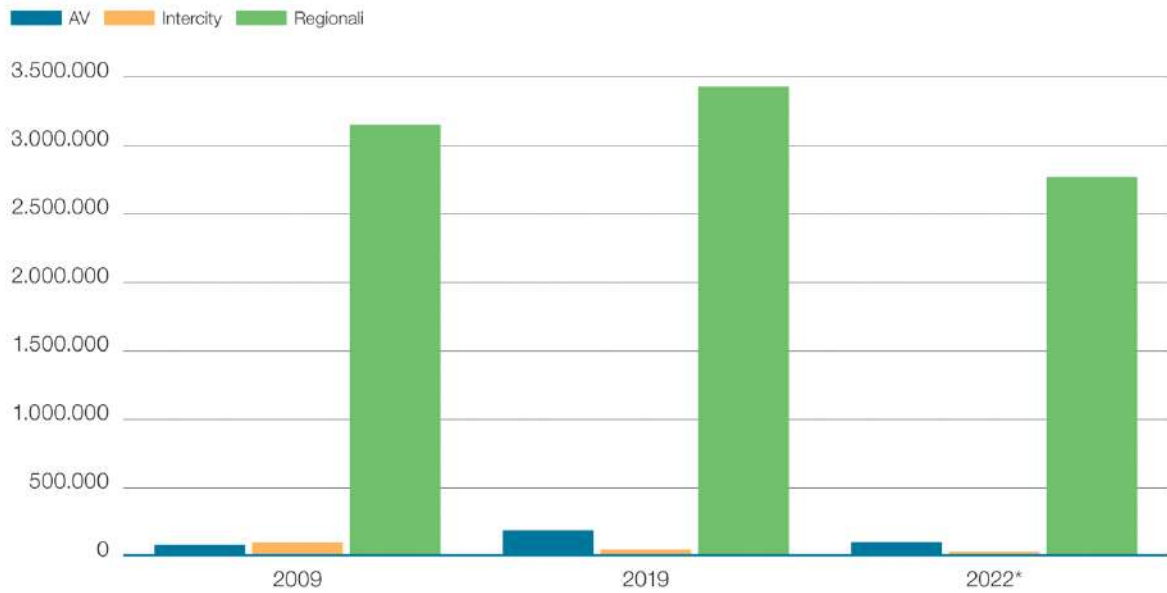
Graph 17: Numbers of travelers per railway service typology. Source: Pendolaria (2024)

Map 39: Trans - European Transport Network. European commission. Source: RFI[35]

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[35] Source: https://www.rfi.it/it/rete/in-europa/corridoi-ten-t.html last visit 29/9/2024

- **Long distance business. High Speed Offer**

The High-Speed Rail offer continues to be a particularly relevant transport segment for market-oriented companies; the infrastructure manager is called upon to meet both the commercial and industrial variations requested by companies and the maintenance of high levels of performance for this commercial product, in accordance with the rules for the use of the infrastructure established in the Network Information Prospectus (PIR). Frecciarossa trains, with more than 260 daily connections, operate on the High-Speed line across 5 distinct commercial routes: / Turin/Milan - Salerno axis, with intermediate stops at Torino Porta Susa, Milano Centrale/Milano Porta Garibaldi, Milano Rogoredo, Reggio Emilia AV, Bologna AV, Firenze Santa Maria Novella, Roma Tiburtina, Roma Termini, Napoli Afragola, and Napoli Centrale.

Throughout the day, there is a spot service towards Brescia, Mantova, Perugia, Battipaglia, Reggio Calabria, Taranto, and Lecce. Additionally, fast connections are available on the Milan - Rome route, with intermediate stops at Milano Rogoredo or Bologna AV; / Venice - Naples axis, with intermediate stops at Venezia Mestre, Padova, Ferrara/Rovigo, Bologna AV, Firenze Santa Maria Novella, Roma Tiburtina, Roma Termini. There is a fast reinforcement channel on the Venice - Rome route, with intermediate stops at Venezia Mestre, Padova, Bologna AV, Roma Tiburtina. During the day, connections are available to Trieste, Udine, and Salerno; / Bolzano - Rome axis, with intermediate stops at Trento, Rovereto, Verona Porta Nuova, Bologna, Firenze Santa Maria Novella, Roma Tiburtina. Throughout the day, there are connections to Bergamo, Vicenza, and Naples; / Milan - Venice cross-sectional route, with intermediate stops at Brescia, Peschiera/Desenzano, Verona, Vicenza, Padova, and Venezia Mestre. Throughout the day, connections are available to Udine, Trieste, Genoa, and Turin. In these cases, the shunt of the stations Venezia S. Lucia and Milano Centrale is provided in accordance with the rules for the use of the infrastructure established in the Network Information Prospectus (PIR); / Adriatic Milan - Lecce axis, with intermediate stops at Parma, Reggio Emilia, Modena, Bologna, Rimini, Pesaro, Ancona, Civitavana, Pescara, Termoli, Foggia, Barletta, Bari, Brindisi. Throughout the day, connections are available to Taranto/Turin/Venice. Frecciarossa connections to and from Rome Fiumicino airport are also active. Around 20 daily connections are made with Frecciargento on the following routes: / Rome - Genoa; / Rome - Foggia/Bari/Lecce; / Rome - Reggio Calabria.

Italo trains provide 118 connections every day, employing ETR675 and AGV575 units along the following routes: / Turin/Milan - Salerno axis, with intermediate stops at Torino Porta Susa, Milano Centrale/Milano Porta Garibaldi, Milano Rogoredo, Reggio Emilia AV, Bologna AV, Firenze Santa Maria Novella, Roma Tiburtina, Roma Termini, Napoli Afragola, and Napoli Centrale. Throughout the day, connections are available to Genoa, Bari, Caserta, and Reggio Calabria. Fast connections are also available between Milan and Rome, with intermediate stops at Milano Rogoredo/Bologna AV and Roma Tiburtina; / Venice - Naples axis, with intermediate stops at Venezia Mestre, Padova, Ferrara/Rovigo, Bologna AV, Firenze Santa Maria Novella, Roma Tiburtina, Roma Termini. During the day, connections are available to Trieste, Udine, and Salerno; / Bolzano - Rome axis, with intermediate stops at Trento, Rovereto, Verona Porta Nuova, Bologna, Firenze Santa Maria Novella, Roma Tiburtina. Throughout the day, connections are available to Bergamo, Brescia, and Naples; / Milan - Venice cross-sectional route, with intermediate stops at Brescia, Peschiera/Desenzano, Verona, Vicenza, Padova, and Venezia Mestre. Throughout the day, connections are available to Udine. In these cases, the shunt of Venezia S. Lucia station is provided in accordance with the rules for the use of the infrastructure established in the Network Information Prospectus (PIR); Additionally, connections are active from/to Rome for Bari/Reggio Calabria.

Map 40: The Premium High-Speed offer. Source: Piano commerciale RFI 2023 p. 516[36]

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[36] https://www.rfi.it/content/dam/rfi/chi-siamo/il-rapporto-con-lo-stato-e-gli-stakeholder/2023-piano-commerciale---novembre-2023/PianoComm.le_revisione_novembre%202023.pdf (last visit 28/09/2024)

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-   **Basic national and international offer**

The existing **Frecciabianca** connections operate on the following routes: / Turin/Milan - Genoa - Rome (via Civitavecchia); / Rome - Ravenna. Long-distance transport is also characterized by **direct international connections** with Austria, France, Germany, Switzerland, and Slovenia. The international services involving the Italian railway network are operated by Trenitalia (in collaboration with SBB-P), Trenord, Rail Cargo Carrier Italia (in collaboration with DB and OBB), and SNCF. Specifically, **Trenitalia** operates 40 daily international connections to Switzerland from Milan, Venice, Genoa (with an extended summer service to Sestri Levante on Saturdays and Sundays), and Bologna. In addition, there is a **night connection** between Rome-Munich/Vienna and La Spezia-Munich/Vienna. There are 4 daily connections between Milan and Paris operated with ETR1000, with intermediate stops at Torino Porta Susa, Bardonecchia, and Oulx. **Trenord** guarantees 14 daily connections via Brennero between Austria/Germany and the cities of Verona, Venice, and Bologna (with a periodic extension to Rimini for the latter). **Rail Cargo Carrier** Italia operates 6 connections on the Vienna-Tarvisio-Venice route and 2 connections on the Trieste-Villa Opicina-Ljubljana route. **SNCF** provides 6 daily connections between Italy and France via Modane, between Milano Porta Garibaldi and Paris, as well as 2 periodic connections, using TGV trains.

-   **The universal service office**

Medium- and long-distance passenger transport is also characterized by the presence of connections that are economically subsidized by the State. The universal service is understood as the minimum set of services with predefined quality and controlled prices by the public authority, which are deemed necessary to be guaranteed to the public, even if they are not economically profitable for the operator providing them. This level of service is currently operated by Intercity trains, which connect **approximately 200 large and medium-sized cities** both during the **day and at night**. The performance of the universal service is continuously improving, thanks in part to the use of reversible rolling stock, which provides benefits in the management of railway traffic and in scheduling at terminal stations.

Map 41: The Basic National and International Offer Source: Piano commerciale RFI 2023 p. 519

Map 42: Universal service offer Source: Piano commerciale RFI 2023 p. 521

6.3 SPECIFIC CHALLENGES OF RAILWAY IN INTERMEDIATE AREAS

Previous paragraph highlighted the main changes around long-distance rail services in the last decades. As deepened, HSR changed radically the rail scenario in Italy and internationally. This topic emerged as an important issue in the international literature in terms of understanding the impacts of high-speed rail (HSR) projects on cities (Garmendia et al 2012), on territorial cohesion (Ortega et al 2012; de Ureña 2012; Coppola and De Fabiis 2023), on regional accessibility (Cavallaro et al 2022), on economic geographies (Chen and Hall 2011) but also on residential and work choice (Willigers and Van Wee 2011), demography (Cisco et al 2024) and more in general on the political and social conflict perspective (Audikana 2021; Audikana and Chen 2016)

From the angle of macroeconomic consequences and trends of "growth" indeed, HSR allow remarkable economic benefits, albeit the high investment costs and financial risks: new employment and GDP growth towards national and regional economies by fostering accessibility and travel time (Chen and Hall 2011; Willigers and Van Wee, 2011; Preston, 2012; Tierney, 2012; see also Lakshmanan, 2011). This may have consequences in demographic tendencies, agglomerations effects and dwelling choices. The institutional benefits from the development of HSR are underlined also from the environmental perspective (REF) long distance travel HSR indeed is considered in relational scale with air mode transport, allowing to decrease pollution at least at the national scale distance.

Nevertheless, the success of high-speed risk to have important *reverse side of the medal* first in social and territorial perspective that are relevant to mention due to the *intermediate* interest of the research. Indeed, both the *historical production* of polycentric urbanization in Italy and the relevant role of midsize cities imply demanding challenges, well understood in literature, concerning the integration of *intermediate* territories in multiscale rail networks.

The polycentric vocation of the Italian urban system become even more evident while seeing at the maps of the high speed rail infrastructures (Map 43).
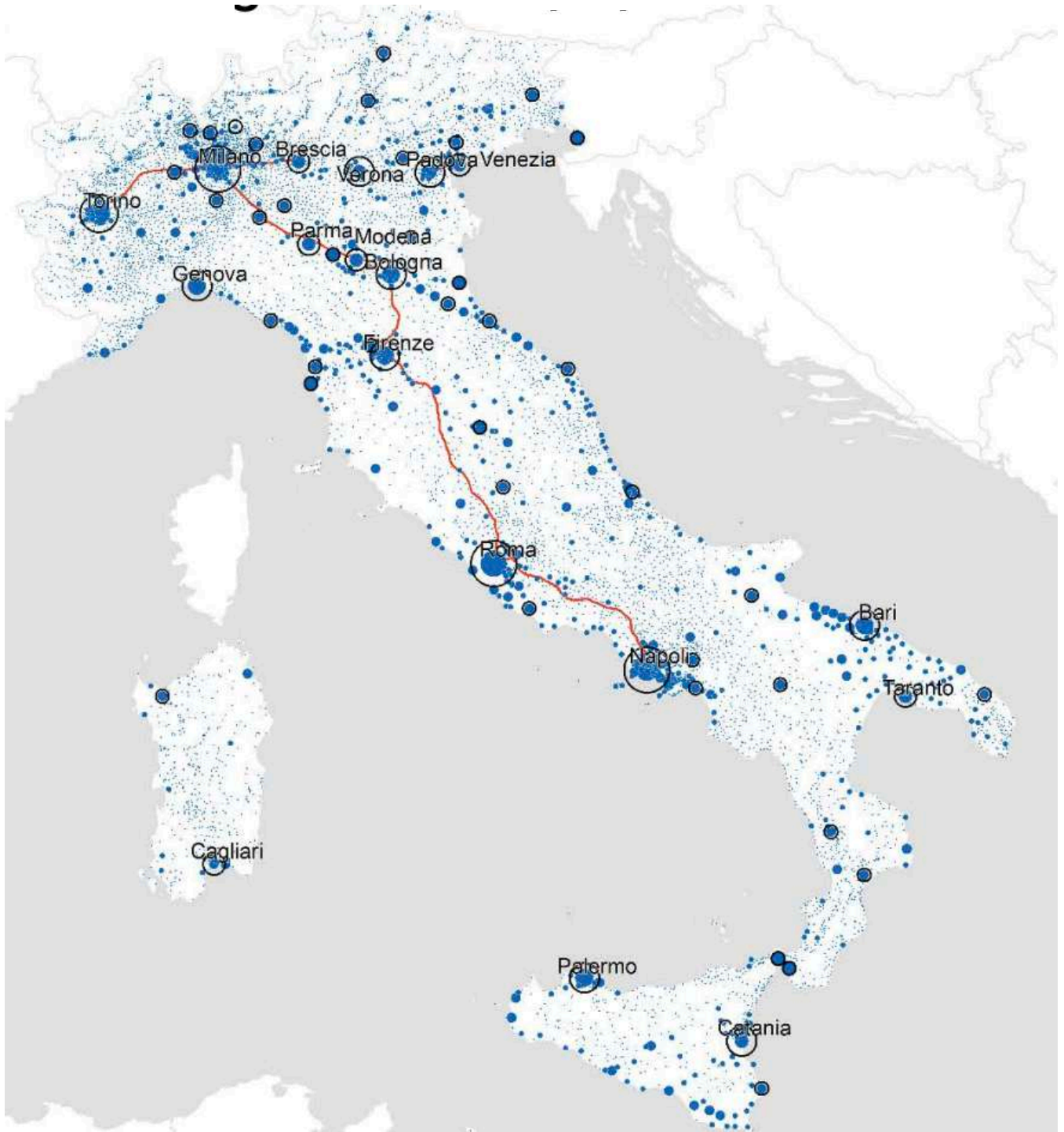
Map 43: Distribution of the high-speed rail network in relation to the population. Source: Beria et al 2020[37]

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[37] Muoversi senza Alta Velocità: https://www.eccellenza.dastu.polimi.it/wp-content/uploads/2020/04/4.2_Muoversi-senza-alta-velocita%CC%80-EDIT.pdf

As mentioned in the theoretical part (3.6) intermediate areas faces some specific challenges regarding accessibility, car dependence and urban sprawl, capillarity of collective and public transport but also its fragmentation and economic fragility processes to which is thus added the topic of territorial effects of high-speed railways just introduced.

The issue of medium-sized cities within the HSR system in an urban -polycentric system is a recurring subject of research. The intrinsic selective nature of high-speed networks has been analyzed by two main recurring aspect and it is deeply related with the aspects underlined in chapter 3.2. This may introduce a conflict between the improvement of national—or international—linkages, and regional connections (Garmendia et al 2012). In other words, it is emphasized the key risks of territorial hierarchization and polarization between main cities equipped with High Speed stations and the one excluded, especially in the case of midsize cities that are crossed by the fast line but doesn't count as a stop. Moreover, as the HSR lines spread and the high-speed services are taken for granted, many cities suffer indirectly for not being in the network. Some authors talk about the ''peripheralizaton of the periphery'' (Hall 2009), as the core cities are drawn closer in terms of time-distance, and the more distant places become relatively more remote (Spiekermann & Wegener, 2008).

This is known as *tunnel effect* or in Italian literature as «*effetto Modena*» [Modena effect] and it regards important midsize poles of 200.000 or 300.000 inhabitants that lose connections and speed because of the *tunnel effect* of High Speed (Beria et al 2020). On the other side there are two cases: first is the one of the towns that albeit the importance in a regional and national scale are not on the High - Speed net, secondly regard the midsize poles that have related to the network that allow a better connection and accessibility, such as Reggio Emilia. Following map (Beria et al 2020) describe these aspects in the Italia context.
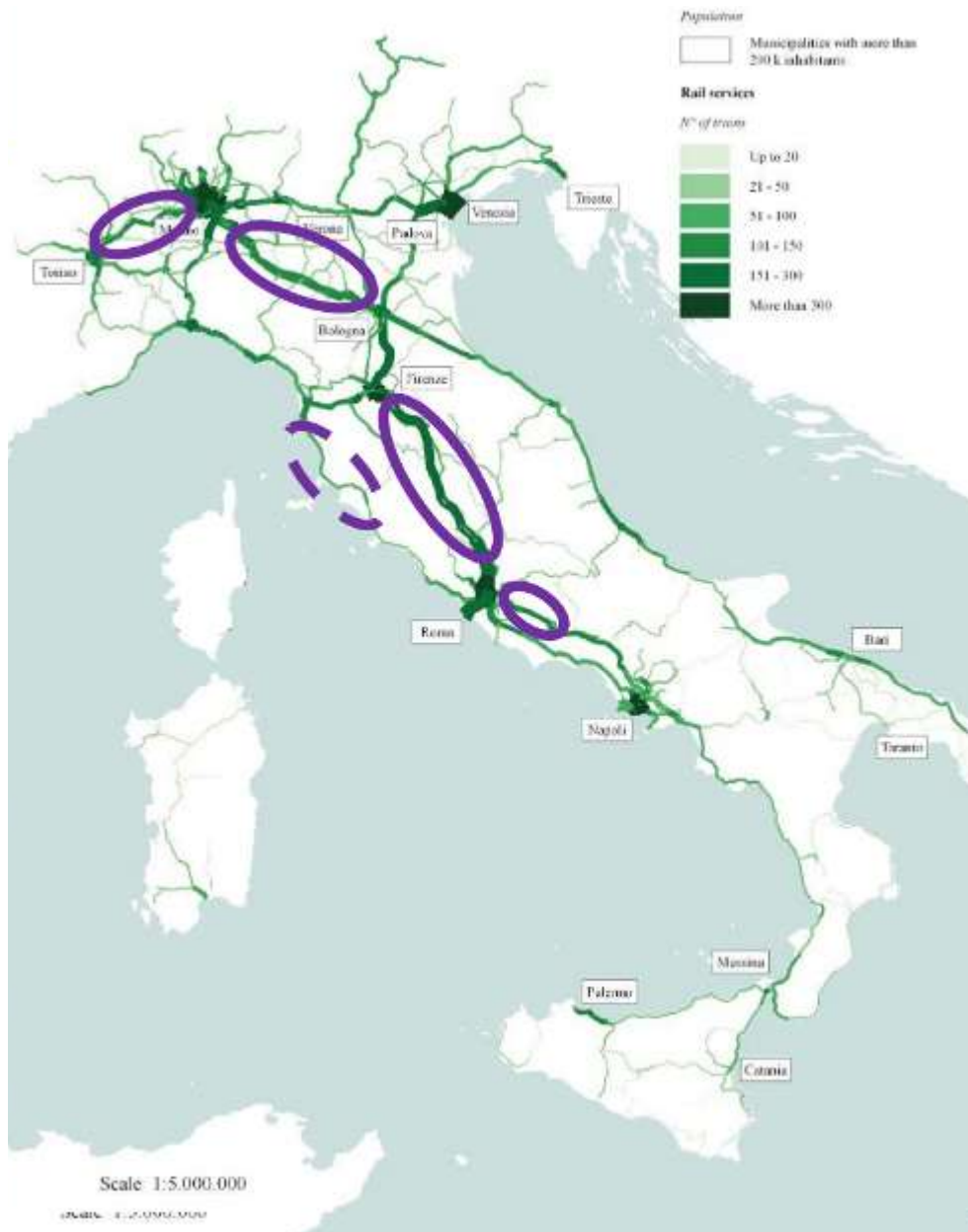
Map 44: «Modena effect /tunnel»: Intermediate territories crossed but not served Fonte: Beria et al (2020)[38]

6.3.1 The European Scenario

First model of European High Speed aimed at the connection only of the main poles has gradually changed in the international scenario (Garmendia et al 2012). Dal The original ''avion sur rails'' French model has also evolved towards "compromising" and more diffuse model in which different scale of cities are involved in the HSR. In some cases, such as the French, the Spanish or the British

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[38] https://www.eccellenza.dastu.polimi.it/wp-content/uploads/2020/04/4.2_Muoversi-senza-alta-velocita%CC%80-EDIT.pdf Last visit: 29/9/2024

«the short or medium distance relationships constitute an unexpected result or an adaptation of the initial model» (Garmendia et al 2012 p. 27).

In Spain for example, RENFE, the main public railway company, implemented a specific medium distance service with lesser quality rolling stock, adequate schedules and discount fares to favor commuting to Madrid, segregating medium and long distance services and releasing the latter (Menendez Coronado, & Rivas, 2002). This had the consequence in consolidating new commuting relationships around Madrid, and opened up new scenarios for HSR in Spain. At the same time in France, the TGV have initiated an interregional system as Parisian interconnection branch, along the Nord-Pas-de Calais region, in opposition to the traditional radial system (Auphan, 2002). Lasty, also in Great Britain «a twofold rationale » is understood. Between Ashford-Ebbsfleet-Stratford-London international long-distance services through the Channel Tunnel Rail Link (Eurostars) and metropolitan HSR services have been split. The international services do not allow commuting to London and the domestic services operate partly along the HSR network and partly along the traditional network, allowing commuting to London.

To sum up, in the seen European contexts (Garmendia et al 2012 p. 28)

> For medium distances (between 100 and 200 km) the HSR connection widens the labor and residential market of the metropolitan area, and to a lesser extent of the small cities. The new mobility patterns and specifically, the new commuting patterns open up new economic and territorial opportunities for the intermediate cities and generate partial integration in metropolitan processes (Garmendia, Ureña, & Coronado, 2011b; Ureña et al., 2012).
> For shorter distance services (less than 100 km) to a metropolitan area may play a twofold role. On the one hand, a peripheral metropolitan HSR station for long distance relationships, and on the other hand, another suburban transport connecting the small city to the center of the metropolitan area. However, the much larger number of metropolitan services vs the long-distance ones suggests the fostering of their metropolitan integration as opposed to the limited role of HSR to connect the small cities towards external and distant urban).

More in general, critical literature picture «HSR as a form of infrastructural development tied to the geographical configuration of contemporary capitalism» (Buier 2020 p. 1604), opposition to HSR indeed, become more clearly a critique of the economic model into which it is embedded.

Indeed, «analysis clearly reveals that not everybody is equally positioned to benefit from the development of HSR (Albalate and Bel 2011; Sanchez-Mateos and Givoni 2012). As mentioned «some cities and regions gain whilst others lose because they are bypassed or see economic activity disappear to places with HSR connections» (Schwanen 2016 p. 128). Moreover, at a closer urban

scale, transport network will likely deepen rather than reduce sociospatial inequalities if coupled with other processes such as gentrification, touristification and logics of commodification and territorial competition. Looking the risks related to the HSR process, the case of Spain is interesting in this sense. Indeed, Buier (2020) points out that «much of the growth of high-speed rail is attributable to its internal cannibalisation with the closure of traditional lines following the opening of the high-speed line» (2020, p. 1614), the advance of this become thus synonymous with the modernisation needed in Spain in the 1990s, in which the traditional obsolete network, a symbol of state inefficiency, was countered with what is termed 'messianic optimism' (ibid., p. 1609) by the technological reorganisation of a network built from the ground up, fast and competitive.

This transformation is accompanied by a major restructuring of the railway sector as a whole, in line with the Italian case, dictated not so much or not only by some confidence in the future as by the need to save its past, in a context of the social domination of the car. Once the lesson and laws of the private sector had been internalised, in order to offer a 'competitive and market-oriented' service (ibid., p. 1608), the Spanish high-speed railways were built with a huge mobilisation of capital through a progressive financialisation of infrastructure projects. On the other hand, the decline of conventional passenger and freight railways has been accelerated by the scarcity of state investment largely directed towards high-speed railways.

At the territorial level, in a context characterised by major inequalities, the development of the high-speed line consolidated the strengthening of regions that were already growing, without altering existing production relations, and accompanied the marginalisation processes of lower-density areas, the so-called 'España vaciada' (ibid., p. 1610), which sought to defend the railway's traditional services.

6.3.2 Insights from Italy

In 2016, *Connettere l'Italia*[39] the programmatic Economic and transport plan from the Italian ministry, spoke about a «new conception of the national infrastructure system that goes beyond the logic of corridors. National planning starts from the nodes of the national system, considering the

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[39] https://www.mit.gov.it/nfsmitgov/files/media/notizia/2017-04/Allegato%20Mit%20Def%20%202017%20-%20slide%20e%20cartine.pdf Last visit: 29/9/2024

infrastructures, and thus the corridors, as a means of connecting them into a single integrated and intermodal network» (MIT 2016 p. 42).

In this direction goes the so-called *network high speed* (**alta velocità di rete)** program (DEF, MIT 2017) that - in line with the aims of the SNIT purpose (cfr. 6.2.2) – is focused towards a quite full accessibility to the speed network and, more in general, towards the acceleration of the whole system by considering the synchronization and the organization of the schedule at different scale. In this sense, local and regional line if connected with an *integrated national strategic timetable* (orario strategico nazionale) properly with the main *branches* can be considered part of the same connective system at a national and international scale.

As mentioned in the official programmatic document (MEF 2017) beside the implementation of new dedicated lines cannot be replicated indefinitely, the objective is to define a certain number of ordinary lines to be speeded up in order to increase the levels of connectivity and accessibility of the regions not directly connected to the HS system. The planned interventions are aimed, in particular, at supporting the production of 'high-speed network' (AVR) services, with the goal of allowing access times to Rome, from all the main urban areas, no longer than 4.5 hours.

The railway routes of greatest interest for HS services include, in particular, the connections of Genoa with Turin and Milan, the Adriatic and Tyrrhenian lines, and some transversal Apennine lines.

This would extend the same capacity for territorial connection, enhancement and the same force of attraction on the rail mode to the largest part, guaranteeing homogeneity of national performance and strengthening the connections of the south with the major European corridors.

DIRETTRICE DI INTERESSE NAZIONALE - PASSEGGERI

ISOCRONE
TEMPI OBIETTIVO INDICATIVI
RIFERITI ALLE PRINCIPALI AREE URBANE

Note:
- le linee tratteggiate rappresentano tratte su cui attivare progetti di fattibilità
- le isocrone fanno riferimento ai tempi di percorrenza assunti come obiettivo all'orizzonte 2030

Map 45: Railway routes of interest for the development of AVR services. Fonte: Connettere l'Italia: fabbisogni e progetti di infrastrutture, All. DEF 2017. Ministery of Economy and Finance p. 79

Whether investments in railways increase or decrease socio-spatial inequalities is an open debate and this work intends to provide some useful elements to the debate from the perspecitive of the *untouched* by high speed intermediate territories looking from the side of practices, meanings and representations of speeds, demands and possible mobility. Nevertheless, and it is highlighted in literature HSR effects can't be counted exclusively on the economic or in terms of *costs and benefits,* but this needs to take care of collective imaginary, representations and self-perception's around connectivity, accessibility, and speed. Going in this direction, this work aims to understand "effects" of High-Speed development rail towards intermediate areas also and especially from this perspective. Beside these aspects relevant insights can be find in the risks of hierarchization within the rail sector more in general. As seen, indeed, railway system is given by the coexistence of different word. Rail transport plays within the framework of the 'coexistence of multiple worlds', in many respects, Favell (2008) in the preface to Eurostar and Eurocities highlights the coexistence of an old and a new European space within which the variable of movement assumes a central significance. These old and new *Europes* coexist and for all the talk of European integration, the 'stayers' in Europe still vastly outnumber the 'movers'.

If the HSR, albeit with all the underlined elements, is thus outlining a Europe of cities, of 'large networked metropolises', a network, the history of secondary lines and their transformation mobilises different scenarios and imaginaries that need at the same time to consider and - at least - describe. In this sense, following paragraph will give some insights about this relation between speeds, scales, histories in the context of transformation of intermediate areas rail services.
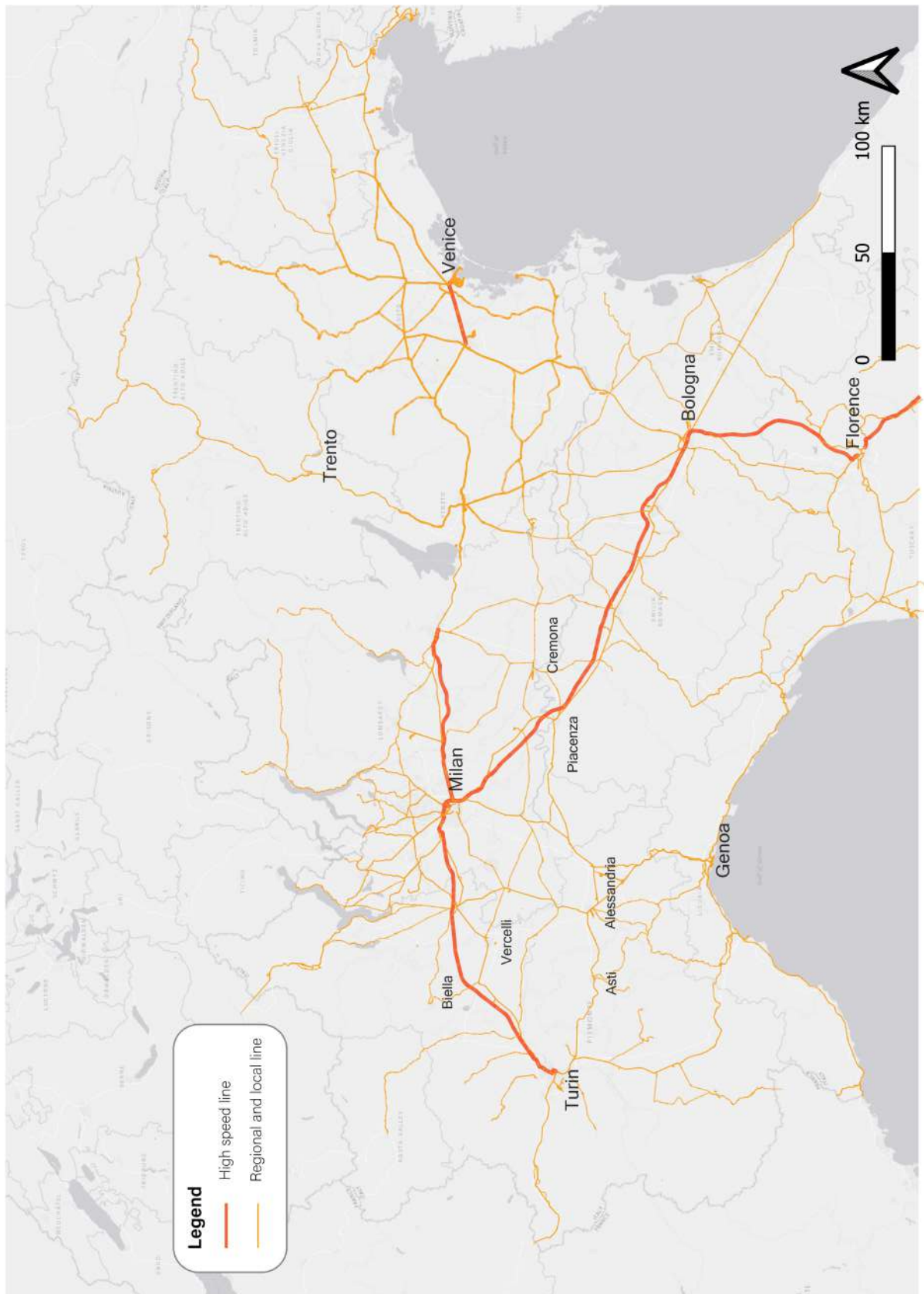
Map 46: Authors elaboration

6.4 RAMI SECCHI E FOGLIE INGIALLITE. THE FALL AND RISE OF SECONDARY LINES IN ITALY

More specifically the other side of the medal of innovation, acceleration, and restyling of railway sector in last decades regard the gradual dismission and *peripherization* of some secondary less profitable lines. This is a multifactorial and multicausal process of which this paragraph will give some preliminary insights from the North West Italy case study considered here as a whole, albeit the internal differences, because of the sovra regional vocation of the process.

The topic of dismission and abandonment of rail lines is a topic often under explored in scientific literature although the interest that gain in local publicity and local history publications. Nevertheless, some research streams are recognizable from the point of view of economic effects (Allen 1975), logistic (Gittings and Thomehick 1987), preparedness (Casavant and Lenzi 1990), historical (Irving 1993), heritage conservation (Amato 2020) and rural communities (Miller et al 1977). In line with the theoretical framework (2.1.1) an interesting perspective on railway change effect on secondary and "small" lines comes from the *foundational economy approach* (Salento and Pesare 2016; Barbera et al 2016; Foundational Economy Collective 2018). In line with the other *infrastructure of everyday life* sectors, the authors (Salento and Pasere, 2016; Barbera et al 2016 pp 87 et seq.; Collettivo per l'Economia Fondamentale, 2019; Bowman et al 2013) highlight how between the end of the 20th and the beginning of the new Century was recognizable a progressive shift in which basic goods and services became interesting for finance and services of high capitalism. They emphasize a critical turning point where the States and the European Union have shifted from being guarantors of the universal public service model to becoming active players in the reorganization of the foundational economy (Salento and Pesare 2016 p. 489) through the transformation of infrastructure from a *public good into an asset class* (O' Brien et al 2019 p. 5). This shift is characterized by a focus on value extraction and the maximization of capital returns, as public institutions withdraw from their traditional role as agents of redistribution, abandoning the principle of public utility as a guiding criterion. This transformation is unfolding across various sectors of the foundational economy, including rail transport, particularly regional services, which remain a vital resource for the daily mobility of many people.

Albeit the first wave of railway promotion during the XIX Century had been guided mainly by private investment. As Bowman and colleagues (2013 p. 14) remember the second wave of «**privatization** of rail services was promoted in the early 1990s with promises of a better, cheaper service for rail users requiring less subsidy by taxpayers. Private rail companies would bring in capital and their

business expertise which would transform the sector's performance». Despite the entrance of the private actor on stage, the role, dependence and the operative risks related to infrastructure are still visible. Rail privatisation created a situation whereby risk and investment averse private companies positioned themselves as value extractors, thanks to high public subsidies. Government effectively took the operating risk, covering operating deficits and supplying investment funds.

Financialization became a well-known process in international literature (O'Brien et al 2019 for the English case, Brouté and Finez 2020 for the French case). It is defined as «the growing influence of capital markets, intermediaries and processes in economic, social and political life» has become a «central concern for states at national, metropolitan/ city regional and city scale in the global North and South» (O'Brien et al 2019 p. 2). In other words, financialization of rail sector has been driven by private actors expanding and intensifying their involvement with urban infrastructure, albeit remaining socially and spatially differentiated, negotiated, and uneven.

On the other side, the need for funding on the other side came from multiple factors such as the ageing and physical deterioration of assets and systems, a rising demands for more integrated, advanced, and sustainable services, and a renewed focus on the pivotal role of infrastructure in enhancing national economic competitiveness, productivity, and modernization. As mentioned, this process hasn't regarded exclusively the rail sector but from one side *foundational economy* in general and from the other the urban development and regeneration assets. Indeed, albeit financiatization of territorial development is much more evident and studied in global cities the example described in this chapter can give some empirical elements about how financiatization process of the infrastructural assets regards closely also what is "by definition" not a global city, nor an attractive urban core.

In this context, between 2004 and 2014, companies operating in the rail services sector experienced a transformation from "declining entities" to "highly profitable enterprises". This radical shift was driven by a multitude of internal and external factors. Internally, under the banner of rationalization, there was a significant reduction in transport volumes—both freight and passenger—a downsizing of rolling stock, and a substantial decrease in workforce, all contributing to an overall reduction in maintenance costs. These internal measures were complemented by a strategic emphasis on financial optimization. Additionally, a considerable portion of the profits was derived from price increases negotiated in the "service contracts" with regional authorities. The burden of railway infrastructure costs increasingly fell upon the regions, prompting some to implement further rationalization of the most marginal, and therefore least profitable, lines—initiating cycles of regional marginalization. Simultaneously, these shifts resulted in direct price increases for passengers. These transformations

occurred alongside a significant expansion in the high-speed rail sector, where revenue per kilometre consistently increased. However, this growth has come at the expense of the "universal subsidized service," which includes long-distance *Intercity* lines that have struggled to remain competitive, as previously seen. Despite receiving subsidies, these lines are priced too high to attract the most economically disadvantaged segments of the population, resulting in a gradual decline in passenger numbers.

This process takes place within a broader European context. The literature highlights several factors contributing to the gradual suspension of secondary local railway lines, such as depopulation, the high cost of rail transport compared to demand, and the declining attractiveness of these lines due to prolonged neglect in maintenance and a lack of technological advancements. Furthermore, decision-making lies with regional authorities, who manage mobility infrastructure and engage in negotiations with various stakeholders, extending beyond just the rail sector to include other modes of transportation.

What are dry branches and what is their history?

Framing the phenomena of dismissing railway in Italy, according to previous works (Pendolaria 2018[40]) «a railway line is considered disused when any regular railway service ceases; it may be disused for a variety of reasons, ranging from wartime to natural events, or due to loss of commercial interest, or bankruptcy of the operating company. As has often been the case, the discontinuation of a line has led to the removal of the railway equipment, and as for the buildings attached to it, they have been left to a state of total abandonment or sold to private individuals'. The 'dead branches' in Italy amount to approximately 1,600 kilometres of railway lines, with more than 427 abandoned stations». This can be considered a long-term process, since II Word war the process of reshaping of the rail map have been constant as well in the last decades.

In synthesis, since 2000, a total of 1,332.2 kilometres of railway lines have been closed, and 356.6 kilometres suspended, often due to landslides, bringing the total to 1,688.8 km and affecting 439 stations and stops. Among the most notable closures are the 14 lines in Piedmont and the cancellation of the Pescara-Naples line. The section between Sesto Calende and Oleggio, on the Piedmont-Lombardy border—once a high-traffic route during peak hours—was closed to passenger services. The same outcome occurred for numerous routes in Calabria and Apulia. Additionally, since late

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[40] https://pendolaria.it/wp-content/uploads/2018/08/Dossierlineearischio.pdf (last visit 30/09/2024)

2013, all trains on the Cremona-Piacenza line have been cancelled and replaced by buses. Many lines remain suspended due to infrastructure issues, such as the Trapani-Palermo (via Milo) route, which has been closed for more than five years following landslides, with no definitive reopening date. Map 47 - 54 provides an overview of these closures at the national level, from different sources.

Following pages will delve into the reduction and suspension of rail lines in the intermediate areas of Northwest Italy. This process primarily affects the Piemonte region (map 47) and is concentrated between 2011 and 2013 as a result of the regionalization of rail transport and the pivotal role of regional political decisions in shaping the planning, implementation, and strategies of local rail networks. Particular attention is given to the intermediate areas of Piemonte (map 51) since the concentration of the process in those intermediate areas, including cross-border regional lines and territories, as long as they fall within the purview of the Piemonte region.

As previously discussed, the challenges of local and collective transport—especially railways and mobility in general—are particularly acute in low-density areas, provinces, and intermediate regions. Within the framework of this case study, a key event warranting deeper investigation is the process referred to as the "cutting of dry branches." The rationale for this focus can be outlined as follows:

- The areas affected are primarily classified as intermediate regions.
- The "cutting of dry branches" and its direct and indirect effects on the mobility of residents in intermediate areas remain under-researched, despite being a recurring theme in public discourse[41], discussions with local actors and in the interviews conducted.
- This is a long-term process with enduring implications.

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[41] https://www.lastampa.it/torino/2012/06/08/news/treni-la-triste-fine-dei-rami-secchi-br-1.36468679/ last visit: 30/9/2024

LINEE CHIUSE E DISMESSE DAL 2000 AD OGGI >>>

Aosta-Pré-Saint-Didier
Chiusura: 2015, 31 km

Varallo Sesia-Romagnano Sesia
Chiusura: 2014, 25 km

Maniago-Gemona
Chiusura: 2012, 41,9 km

Arona-Santhià
Chiusura: 2012, 65 km

Torre Pellice-Pinerolo
Chiusura: 2012, 17 km

Laveno Mombello-Oleggio
Chiusura: 2013, 36,1 km

Rovato Borgo-Bornato Calino
Chiusura: 2018, 5,7 km

Saluzzo-Cuneo-Mondovì
Chiusura: 2012, 79 km

Portomaggiore-Dogato
Chiusura: 2017, 13,1 km

Fano-Urbino
Dismissione: 2011, 48,7 km

Ancona-Ancona marittima
Chiusura: 2015, 1,7 km

Ceva-Ormea
Chiusura: 2012, 36 km

Sulmona-Carpinone
Chiusura: 2011, 118,1 km

Andora-Bordighera, 49 km
Dismissione: 2001-2016

Pergola-Fabriano
Chiusura 2013, 31,6 km

Marina di S. Vito-Castel di Sangro
Chiusura: 2006, 102,6 km

S. Stefano di Magra-Sarzana
Chiusura: 2003, 2,5 km

Bosco Redole-Benevento
Chiusura 2013, 66,2 km

Pisa centrale-Pisa aeroporto
Dismissione: 2013, 2,1 km

S. Nicola di Melfi-Gravina in Puglia
Chiusura 2011, 80,9 km

Parco Leonardo-Fiumicino Città
Dismissione: 2000, 5,8 km

Priverno-Terracina
Chiusura 2012, 17,5 km

Brindisi-Brindisi Marittima
Dismissione: 2006, 1,7 km

Olbia-Olbia Marittima
Dismissione: 2000, 2 km

Cancello-Torre Annunziata
Dismissione: 2014, 31 km

Pedace-San Giovanni in Fiore
Chiusura: 2011, 67 km

Codola-Sarno
Chiusura: 2012, 7,8 km

Castellammare di Stabia-Gragnano
Chiusura: 2010, 4,7 km

Rocchetta S. Antonio-Avellino
Chiusura: 2010, 118,7 km

Marzi-Soveria Mannelli
Chiusura 2012, 31,5 km

1.561 km
totali di ferrovie
chiuse e dismesse

Gioia Tauro-Cinquefrondi
Chiusura: 2011, 31,7 km

Trapani-Palermo (via Milo)
Chiusura 2013, 47,1 km

Gela-Caltagirone
Chiusura 2011, 45,1 km

1- Tortona-Novi Ligure
Chiusura: 2012, 19 km

2- Alessandria-Ovada
Chiusura: 2012, 34 km

3- Alba-Asti e
Alba-Nizza Monferrato
Chiusura: 2010 e 2011, 65 km

4- Chivasso-Asti
Chiusura: 2011, 52 km

5- Asti-Castagnole delle Lanze
Chiusura: 2012, 20,1 km

6- Vercelli-Casale Popolo
Chiusura: 2013, 19,2 km

7- Bra-Cavallermaggiore
Chiusura: 2020, 12,9 km

Legambiente, rapporto Pendolaria 2023

Map 47: Closed and disused rail line in Italy source Pendolaria 2024 p. 38[42]

Map 48: High Speed, regional and disused Rail networks in Northern Italy. Author elaboration on OSM data.
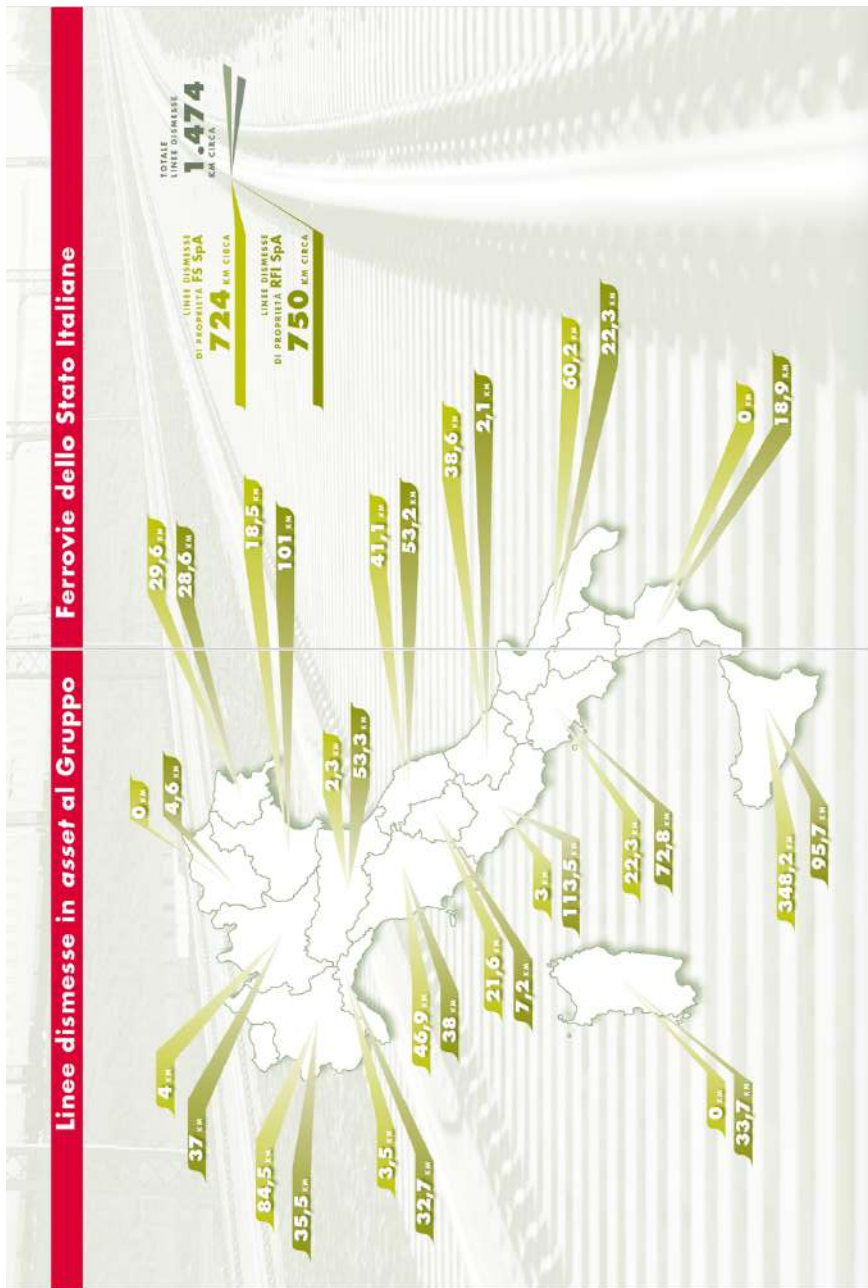
Map 13 : Disused railway lines of the ferrovie dello stato group. Source: Atlante delle linee dismesse, RFI (2016) p. 22
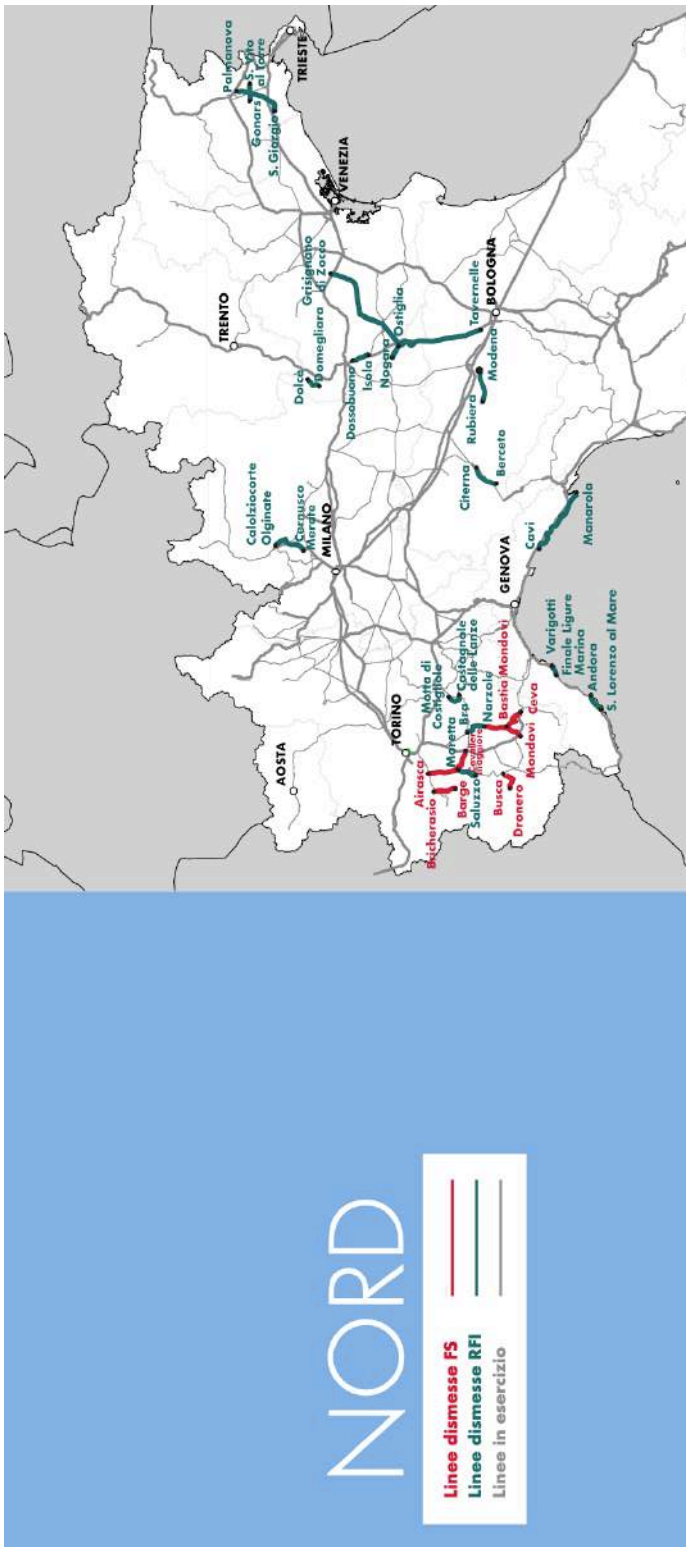
Map 49: Portrait of the disued railway lines. North Italy focus. Source: Atlante delle linee dismesse, RFI (2023) p.45

Linee dismesse FS **0 km**
Linee dismesse RFI **1 km**

Linee dismesse FS **4,4 km**
Linee dismesse RFI **33,4 km**

Linee dismesse FS **3,3 km**
Linee dismesse RFI **30,7 km**

Linee dismesse FS **3,1 km**
Linee dismesse RFI **99,2 km**

Linee dismesse FS **62,1 km**
Linee dismesse RFI **26,4 km**

Linee dismesse FS **2,3 km**
Linee dismesse RFI **53,3 km**

Linee dismesse FS **1,5 km**
Linee dismesse RFI **31,3 km**

Linee dismesse FS **22,3 km**
Linee dismesse RFI **33,8 km**

Linee dismesse FS **0 km**
Linee dismesse RFI **94,1 km**

Linee dismesse FS **9,4 km**
Linee dismesse RFI **7,2 km**

Linee dismesse FS **0 km** Linee
dismesse RFI **2,1 km**

Linee dismesse FS **3 km**
Linee dismesse RFI **115,4 km**

Linee dismesse FS **40,6 km**
Linee dismesse RFI **48,3 km**

Linee dismesse FS **0 km**
Linee dismesse RFI **72,9 km**

Linee dismesse FS **1,4 km**
Linee dismesse RFI **31,8 km**

Linee dismesse FS **1,2 km**
Linee dismesse RFI **7,1 km**

Linee dismesse FS **279,7 km**
Linee dismesse RFI **177,2 km**

Linee dismesse FS	434,3 km circa
Linee dismesse RFI	855,5 km circa
Linee dismesse totali	1.289,8 km circa

27

Map 50: Map 3: Disused railway lines of the ferrovie dello stato group. Source: Atlante delle linee dismesse, RFI (2023) p. 22

6.4.1 An Overview of Piedmont Railways

As introduced in the previous paragraph the process of dismission of railway network in Piemonte region assumed a tangible extent. Albeit some of the reasons of this can be found in an historical reason – due to the fact that this area has been pioneer in the first development of Italian rail and industrial skeleton in the second part of XIX century, some more recent issues, elements will be arisen in the following paragraph.

The Italian railway network reached its greatest extent in 1942, with 23,227 kilometers of track—a peak from which the reshaping of the network began in the aftermath of the Second World War (6.1). At that time, Piedmont's total network stretched just below 2,000 kilometers, of which 1,120 kilometers were main lines and the remaining 880 kilometers were secondary lines. Despite the historical pervasiveness of the network, these secondary lines experienced low traffic, and their construction characteristics dated back to the early days of the railway. In contrast, other main lines were facing saturation, and there was a pressing need to revise the Turin hub, which gradually assumed a pivotal role in internal migration during the 1960s, becoming a key node in the migration-driven mobility system, largely reliant on rail transport.

The widespread proliferation of automobiles and the improved safety of roads and highways led to a reimagining of the railway's role. What had once been a symbol of progress was, within less than a century, increasingly seen as the "transport of the poor." The years of the "Economic Miracle" were marked by lengthy, often overnight journeys on the *Treno del Sole* and the *Freccia del Sud*, connecting Palermo, Syracuse, and Reggio Calabria to Genoa, Turin, and Milan.

In the early 1970s, the first extraordinary plans were launched, and in 1981, a law authorized the "execution of reclassification, enhancement, and modernization interventions for lines, equipment, and facilities." These funds were used for the replacement of metal trusses, the reinforcement of masonry bridges, the repair of bridges and viaducts, the consolidation of tunnels and artificial tunnels, and the quadrupling of the section between Turin Lingotto and Trofarello. The facilities in Novara Smistamento, Fossano, and Acqui were upgraded. In the Turin area, the section between Turin Porta Susa and Turin Stura was also quadrupled, while platforms, canopies, and underpasses were modernized. ACEI devices were installed in numerous stations, including Ceva, Cuneo, Acqui, Casale, Bra, and Borgomanero. However, in line with the national context, these interventions were primarily focused on ensuring the "safety" of the lines, in addition to general infrastructure enhancement.

The widespread diffusion of both trains and automobiles, despite their differences, brought about significant structural changes at the social level. The freedom of movement associated with these different modes of transport and the broad availability of travel began to alter habits and reshape the possibilities of mobility; the distance between home and workplace could gradually increase. While this was undoubtedly a general phenomenon, in the Piedmont region, the development of the automotive industry took on specific characteristics due to the strong presence of FIAT, which shaped not only mobility habits but also the urban layout of the regional capital, the labor market, regional production organization, collective interests, and the landscape of actors involved in the mobility sector. This created a context in which local political and industrial interests shifted attention away from the potential of the railway system and the region's polycentric structure, inherited from the past. As a result, secondary railway lines progressively deteriorated, leading to their eventual closure.

Following diagrams (table 30 and table 31) highlights the differences on regional expenditure on rail commuting services (2016 and 2022), according to Legambiente (2017; 2024).

Regioni e Provin-ce Autonome	Stanziamenti per il servizio (mln Euro)	Stanziamenti per il materiale rotabile (mln Euro)	Stanziamenti sul bi-lancio regionale (%)
Pr. Trento	36,5	42	1,54
Toscana	88,7	0	1,02
Pr. Bolzano	55,76	5,32	1,01
Campania	66,15	131,768	0,98
Valle d'Aosta	0,09	8,38	0,84
Lombardia	145,3	0	0,69
Liguria	16,66	2,6	0,39
Emilia-Romagna	37	10	0,37
Veneto	18,5	13,3	0,22
Abruzzo	13,96	0	0,17
Sicilia	0	17,06	0,11
Lazio	0	12	0,06
Umbria	1,5	0,049	0,06
Piemonte	6,4	0	0,05
Friuli Venezia Giulia	1,5	0	0,04
Sardegna	0	0	0
Basilicata	0	0	0
Marche	0	0	0
Puglia	0	0	0
Calabria	0	0	0
Molise	0	0	0

Table 29: Regions' expenditure on commuter rail services 2016. Source: Legambiente 2017

Table 30: Regional expenditure for local railway service (2022). Source: Legambiente 2024

Regioni e Pr. Autonome	Stanziamenti per il servizio (mln euro)	Stanziamenti per il materiale rotabile (mln euro)	Stanziamenti sul bilancio regionale (%)
Valle d'Aosta	16,6	25,39	3,11%
Abruzzo	0	78,6	1,87%
Friuli-Venezia Giulia	77,83	18,7	1,66%
Provincia di Bolzano	65,18	5,32	1,09%
Lombardia	134,6	193	0,94%
Campania	1,62	237,07	0,80%
Emilia-Romagna	54,41	60,50	0,69%
Liguria	17,08	2,6	0,41%
Sicilia	4,55	28,09	0,16%
Veneto	0,01	15,42*	0,11%
Marche	0	3,98	0,08%
Lazio	0	10,2	0,04%
Piemonte	0,20	0	0,001%
Sardegna	0	0	0
Molise	0	0	0
Puglia	0	0	0
Calabria	0	0	0
Provincia di Trento	n.d.	n.d.	n.d.
Toscana	n.d.	n.d.	n.d.
Umbria	n.d.	n.d.	n.d.
Basilicata	n.d.	n.d.	n.d.

Moreover, following diagrams give an idea of the process of reshape of railway line in Piemonte, totally 1688,8 km and 439 stations have been closed and suspended (Legambiente 2018).

1) Closed railway lines before 2000

Piemonte	Km	Stations
Airasca-Moretta-Saluzzo	33,4	9
Biella-Ponte Cervo-Balma	13,3	13
Biella-Cossato-Valle Mosso	19,3	21
Bra-Bastia Mondovi'-Ceva	49,9	11
Bricherasio-Barge	11,5	4
Busca-Dronero	12,5	4
Castellazzo-Masserano	5,5	5
Cavallermaggiore-Moretta	15,2	5
Cuneo Gesso-Borgo San Dalmazzo	12	4
Rivarolo-Castellamonte	7,1	3
Stresa-Mottarone	9,8	7

Table 31: : Suspended and closed railway lines before 2000. Source: Legambiente (2018)

2) Closed railway lines between 2000 and 2018

Linea sospesa e chiuse al trafffico	Km	Stations
Piemonte		
Tortona-Novi Ligure	22	4
Alessandria-Ovada	34	7
Asti-Castagnole delle Lanze	20,1	7
Bastia Mondovi'-Cuneo	42	13
Cantalupo-Nizza Monferrato-Castagnole della Lanza-Alba	59,6	17
Ceva-Ormea	35,4	9
Chivasso-Asti	51,3	17
Mortara-Casale Monferrato-Asti	73,4	20
Santhià-Arona	65	10
Vercelli-Casale Popolo	19,2	6
Pinerolo-Torre Pellice	16,4	7
Romagnano Sesia-Varallo Sesia	25,1	9
Sesto Calende-Oleggio	15,1	3

Table 32: Suspended and closed railway lines (2000 – 2018). Source: Legambiente (2018)

Nevertheless, the topic does not end with the railways being closed and suspended in the past decades, but it is still an ongoing process. Legambiente, for example, proposes this classification and monitoring of the lines under consideration as 1. At risk of closure, 2. With inadequate supply.

As far as the area under analysis is concerned, the following cases should be highlighted:

1) Railway lines at closure risk (2018)

Linea	Km	Stazioni/fermate
Cuneo-Ventimiglia	96	17
Faenza-Lavezzola	32	9
Campiglia-Piombino	16	4
Sacrofano-Viterbo	86	21
Foggia-Manfredonia	36	6
Spinazzola-Barletta	66	4
Catanzaro Lido-Taranto	295	29
Sassari-Olbia	116	8
TOTALE	743	98

Table 33: Lines at risk of closure. Source: Legambiente (2018)

Of which the Cuneo - Ventimiglia is an example for the area under analysis where the number of daily train pairs has dropped from 14 in 2002 to just 2, as planned before the temporary closure for modernization. Work has been carried out on the Tenda tunnel, and 47 kilometers of track have been secured at a cost of 29 million euros. The key projects included replacing 7 kilometers of track components, installing 6 grids and 9 protective nets against rockfalls, and refurbishing five railway bridges.

2) Railway lines with inadequate supply (2018).

This category includes lines where the train service is inadequate in relation to the potential of the areas they serve, and as a result, risk losing an increasing number of passengers, potentially leading to closure in the future. These are routes with old trains, reduced frequency of services, and a lack of investment due to being excluded from national and regional infrastructure planning. In addition to these issues, other factors include the closure of what are considered minor stations and stops, the aging of the trains, and the absence of upgrades to the network. In total, these amount to 2,597 km spread across 28 lines and 344 stations and stops. Regarding the case study area, it is wortjy considering the Pavia-Mortara-Vercelli line. This line, which connects Lombardy and Piedmont, extends for 67 kilometers and includes 12 stops for its 13 pairs of direct trains. As with other cases, it is a single-track, non-electrified line, with a daily ridership of only 2,700 passengers. Beyond its infrastructural shortcomings, it should be emphasized that, following branch line cuts and closures by the Piedmont Region between 2012 and 2014, the line has become progressively less appealing to its users.

Present and future scenarios

However, in recent years, in line with the evident changes in public awareness surrounding sustainable mobility, accelerated by COVID-19 and the urgency of measures to counter climate change, some significant developments have occurred. For example, in the context under review, the Mortara-Casale and Asti-Alba[43] lines were recently reopened (on 11/09/2023) after 12 years of suspension.

In the case of the first line, there are 14 daily services (with an investment of 3 million euros), which also provide faster connections from this part of Piedmont to the city of Milan. In fact, connections at Mortara with trains to Milan Porta Genova are ensured (barring delays or cancellations). Furthermore, with the start of the rail service, the schedules of bus line 406 Asti-Casale-Mortara were adjusted to continue serving intermediate locations not covered by the train.

For the Asti-Alba railway line (33 km), 12 daily services have been introduced. The 3 million euros per year investment is coupled with the 13 million euros invested by RFI for safety works on the line, making its reactivation possible. The stops at Asti, Isola d'Asti, Costigliole, Castagnole, Neive, and Alba serve a total catchment area of 120,000 people, now offered a comprehensive service of over 100,000 train kilometers per year, operated by Trenitalia.

Lastly, following table give a portrait of the *future scenarios* on suspended and closed lines, according to Legambiente (2024) with specific focus on Piemonte and Lombardia.

Another example reported in the public debate concerns the relaunch of the Cuneo – Saluzzo[44] – Savigliano line starting from January 1, 2025, based on the pre-assignment service contract signed in March 2024 between the Piedmont Mobility Agency and Longitude Holding, which includes Arenaways company and RENFE. The contract has a duration of 10 years, and the company will invest 40 million euros to restore 14 daily trains on the line. The contract also includes the Ceva – Ormea line, although its reopening is not expected before 2028. Both lines were suspended in 2012.

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[43] Viarengo (2023) *Dopo 12 anni torna il treno Asti-Alba, La Stampa*:
https://www.lastampa.it/asti/2023/09/11/news/10_anni_treno_asti-alba-13094526/
[44] Rosso (2024) *Dodici anni dopo tornano i treni sulla Cuneo-Saluzzo-Savigliano. Ma la vera sfida sarà riportare gli utenti a bordo* https://www-lastampa-it.cdn.ampproject.org/c/s/www.lastampa.it/cuneo/2024/09/12/news/dodici_anni_dopo_tornano_i_treni_sulla_cuneo-saluzzo-savigliano_ma_la_vera_sfida_sara_riportare_gli_utenti_a_bordo-14627934/amp/

Table 34: Pendolaria 2024 p. 59

SCENARIO 2030, LE FREQUENZE SULLE RELAZIONI FERROVIARIE DA ATTIVARE, RIATTIVARE O REALIZZARE

	Frequenza treni 2023 (punta/morbida)	Frequenza treni al 2030 (punta/morbida)	Opera connessa
Piemonte			
SFM 9 Avigliana-Chieri	non esistente	30/60 minuti	Elettrificazione Rivarolo-Pont
Torino-Cuneo-Ventimiglia/ Nizza	2 coppie	120 minuti, sperimentando anche corse su Nizza	Potenziamento linea, coordinamento internazionale
(Cavallermaggiore-)Alba-Asti/Alessandria	linee sospese	30/60 minuti	Riapertura ed eventuale elettrificazione
Novara-Vercelli-Casale-Alessandria	linee sospese	30 minuti	Riapertura ed eventuale elettrificazione
Novara-Varallo	linee sospese	60 minuti	Riapertura
Anello Granda (Bra-Savigliano-Saluzzo-Cuneo-Mondovì)	linee sospese	30/60 minuti	Riapertura ed eventuale elettrificazione
Torino-Santhià-Arona(-Domodossola)	linee sospese	60 minuti	Riapertura ed eventuale elettrificazione
Torino-Santhià-Borgomanero(-Domodossola)	linee sospese	60 minuti	Riapertura ed eventuale elettrificazione
Lombardia			
Milano-Carnate-Bergamo(-Orio al Serio)	60 minuti	30 minuti	Nuova connessione all'aeroporto
Brescia-Cremona-Piacenza-Genova	non esistente; tratta Cremona-Piacenza sospesa	120 minuti	
Alessandria/Asti-Mortara-Milano	relazioni spot	60 minuti Asti-Casale-Mortara-Milano; 60 minuti Alessandria-Mortara-Milano	Mantenimento della stazione di Milano Porta Genova; Potenziamento Casale-Mortara e Alessandria-Mortara; raddoppio Mortara-Albairate; riapertura ferrovia Asti-Casale
S16 Abbiategrasso-Rho	non esistente	30 minuti	Realizzazione linea circolare

In the light of what presented in this paragraph, following table and maps provide an overview of the current railway context in Piedmont (map 51). As highlighted, the Piedmont region is still an important part of the Italian railway framework and its relation to the territorial landscape. The role of Piedmont's railways with respect to the territorial fabric is significant, especially when considering

the relationship between the density of the RFI network and the population in the areas served (table 36, 37). However, with regard to the usage rate of the RFI network for local public transport out of the total train*km in the region, the graph (table 38) shows a less uniform situation.

For a more detailed overview, reference can be made to the RFI 2023 Commercial Plan[45], which provides both a national and regional perspective regarding the strategies of the railway infrastructure manager.

Table 35: Numbers of RFI in Piemonte. Density of the RFI network in relation to the population Source: RFI (2023)

408,1   km/1 mln abitanti

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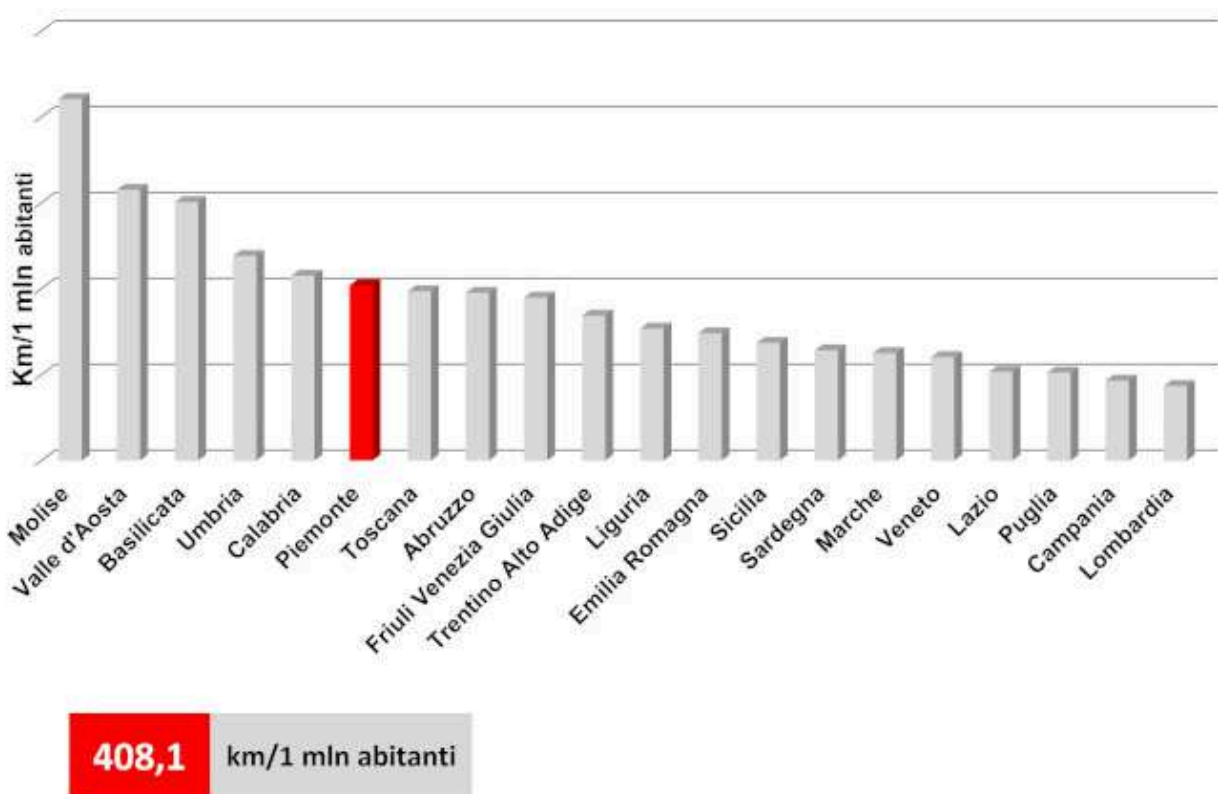
[45] https://www.rfi.it/content/dam/rfi/chi-siamo/il-rapporto-con-lo-stato-e-gli-stakeholder/2023-piano-commerciale---novembre-2023/PianoComm.le_revisione_novembre%202023.pdf Last visit 6/10/24

Table 36: Numbers of RFI in Piemonte. Density of the RFI network in relation to the area served. Source: RFI (2023)

0,075	Km/km²
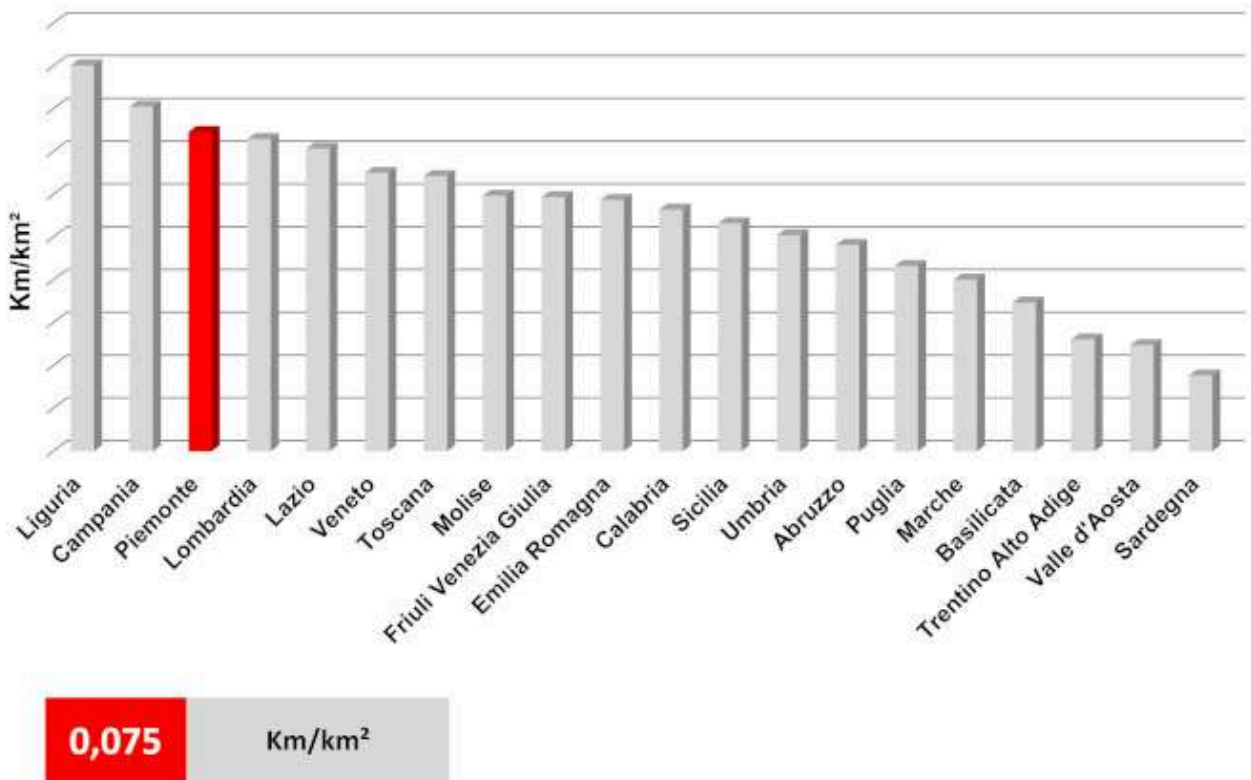
Table 37: Numbers of RFI in Piemonte. Degree of utilization of the RFI network for LPT services. Source: RFI (2023)

7.113	Treni*kmTPL/km binario

Map 51: Rete Ferroviaria Piemonte. Source: RFI

6.6 AN HAPPY ENDING? ONGOING PROJECTS AND A NEW FOCUS ON INTERMEDIATE AREAS

6.6.1 THE REVIVAL OF TOURIST RAIL TRANSPORT

The previous paragraph shed light on new scenarios and perspectives for the railway system in recent years. Since the pandemic and the growing emphasis on sustainability, a new narrative, new strategies, and significant investments have emerged in the railway sector, both in Italy and internationally. As will be explored in the next section (6.6.2), a key role is played by investments tied to the PNRR, aimed at reducing territorial disparities and at rebalancing of smaller centralities through regional and intermediate-scale transport (e.g., the rebranding of Trenitalia's regional lines, supported by an extensive marketing and advertising campaign in the second half of 2024).

Railway tourism in Italy has also garnered increasing interest recently, driven by a renewed organizational structure and a stronger presence in the railway market.

This paragraph seeks to outline the relationship between tourism and railways, the revival of secondary and minor railway lines, and the repurposing of suspended lines for tourism reasons. It will also highlight the main actors in this process as it has revealed in Italy, along with the key milestones.

The pandemic contributed to making 2020 the year of domestic tourism. Travel restrictions made international trips impossible for well-known health reasons, prompting a surge of interest in domestic tourist destinations, particularly lesser-known ones such as villages, mountain areas, and second homes—places offering greater isolation to mitigate the risk of infection. This shift aligned with the long-standing interest in "sustainable" or "slow" tourism. Although railway tourism trend has seen a resurgence in recent years, it is a phenomenon with deep historical roots. The link between railways and tourism is significant not only because trains serve as a means of reaching tourist destinations but also because the journey itself—aboard special carriages or along otherwise inaccessible routes—can become the experience. This phenomenon is observed not just with trains but also with various modes of transport that evolve into attractions in their own right or iconic symbols of tourism. According to literature

> «Rail tourism describes the fusion between traveling to a destination by rail and train as the destination (Dickenson and Lumsdon 2010). The concept encapsulates the experience, and/or symbolic consumption, related to traveling by train (including the experience of railway architecture such as stations, tunnels, and viaducts) and visiting railway museums. Studies on rail tourism acknowledge the heritage value as well as the sociocultural and human geographical dimensions related to train travel, together with cheap or high-end luxury travel» (Jensen and Bird 2016)

The train itself can be a tourist attraction, creating a dual interest for both the railway and territorial/tourism actors. In fact, the objectives of enhancing minor railways for tourism purposes are made explicit by railway stakeholders, emphasizing their role in "landscape enjoyment and accessibility to sites of major interest" (III).

In Italy, the main player in railway tourism is undoubtedly the FS Foundation, established in 2013. The foundation is dedicated to preserving and promoting Italy's railway history and technology. It maintains an audiovisual archive, a library, manages the National Railway Museum in Pietrarsa, restores historic rolling stock, and organizes journeys on historical trains along tourist lines. Figures 20, 21, and 22 provide an overview of the foundation's resources, its key areas of activity, and estimates of the social and cultural impacts generated.

20 locomotive a vapore
21 locomotive elettriche e diesel
13 automotrici elettriche e diesel
110 carrozze e veicoli speciali
28 carri e bagagliai
18 carrozze del treno presidenziale
1 Elettrotreno veloce ETR 252 Arlecchino

55 rotabili da esposizione
39 modelli in scala e plastici di stazioni
1 biblioteca con circa 2.000 volumi
1 plastico Trecentotreni, dimensioni 18x2m
1 plastico della ferrovia retica Tirano-Saint Moritz, dimensione 56m
1 plastico della stazione di Battipaglia, dimensioni 4x1,8m
1 plastico De Marchi, dimensioni 4,5x1,5m

12.000 disegni e planimetrie della rete e delle stazioni
7.000 disegni architettonici di stazioni ed edifici ferroviari
7.000 rotoli di disegni tecnici di locomotive e rotabili storici
10.000 immagini fotografiche di rotabili, mezzi di trazione, carrozze e carri

60.000 volumi storici e periodici
2.000 planimetrie e profili

500.000 foto in b/n e a colori, analogiche e digitali
3.500 cassette video
3.000 pellicole cinematografiche

Figure 20: Fondazione FS. Key numbers. Source: Sustainability report p. 202

VIAGGI CON TRENI STORICI

416 singole corse con treni d'epoca per un totale di **75.110** viaggiatori

185 viaggi con treni storici sui Binari senza tempo* per un totale di **43.283** passeggeri

70.357 chilometri percorsi

4.270.000 euro di ricavi

MUSEO NAZIONALE FERROVIARIO DI PIETRARSA

265.012 visitatori

2.223 visitatori treno storico

65 grandi manifestazioni

2.904.996 euro di ricavi

ARCHIVI, BIBLIOTECA E PRODOTTI DIGITALI

200 utenti in presenza

420 richieste di documenti delivery/ divulgazione del patrimonio

5.000 documenti archivistici digitalizzati e pubblicati online

7 mostre/eventi in collaborazione

Figure 21: Fondazione FS. Key numbers. Source: Sustainability report p. 202

CONTRIBUTI DA SOCI[1]
139 milioni di euro

VALORE DEL PATRIMONIO[3]
10,6 milioni di euro

RICAVI DA ATTIVITÀ[2]
35 milioni di euro

VALORE PER LE COMUNITÀ LOCALI[4]
59,7 milioni di euro

Figure 22 Fondazione FS. Key numbers. Source: Sustainability report p. 202

Crucial to the public action of the Fondazione Fs is the 'Binari senza tempo' (Timeless Tracks) project, which was launched in 2014 to promote the development of railway tourism by organising, with its historical rolling stock, journeys aimed at discovering and enhancing the railway lines that pass through «the most evocative landscapes of the Italian provinces». This is the Fondazione Fs project aimed at giving «new life to ten railway lines that cross the Italian provinces, creating an innovative formula of railway tourism». The lines reopened by the Foundation for the exclusive purpose of tourism in Italy by 2024 are 13 corresponding to approximately 600 km (map 52). The lines in the project are presented as «lines that have fallen into the background for the regular transport of people and goods but with scenic and tourist potential in areas of Italy to be rediscovered and opened up for the future».

Map 52: Binari senza tempo project map. Source: Fondazione FS

	NAME	RAILWAY	REACTIVATION	KM
1	Ferrovia del Sebino	Palazzolo S.O. – Paratico Sarnico	2014	10 km
2	Ferrovia della Val d'Orcia	Asciano – Monte Antico	2014	51 km
3	Ferrovia Transiberiana d'Italia	Sulmona – Carpinone	2014	118 km
4	Ferrovia dei Templi	Agrigento Bassa – Porto Empedocle Succursale	2014	12 km
5	Ferrovia della Valsesia	Vignale – Varallo Sesia	2015	51 km
6	Ferrovia del Tanaro	Ceva – Ormea	2016	35 km
7	Ferrovia dell'Irpinia	Avellino – Rocchetta S.Antonio Lacedonia	2016	119 km
8	Ferrovia del Sannio	Benevento – Bosco Redole	2017	66 km
9	Ferrovia Pedemontana	Sacile – Gemona del Friuli	2018	75 km
10	Ferrovie delle Langhe Roero e Monferrato	Asti – Alba – Castagnole delle Lanze – Nizza Monferrato	2018	58 km
11	Ferrovia Subappennina Italica	Fabriano – Pergola	2021	31 km
12	Ferrovia del Basso Monferrato	Asti – Chivasso	2022	51 Km
13	Ferrovia delle Murge	Rocchetta S.Antonio Lacedonia – Gioia del Colle	in corso	139,2 Km

From the map it is visible the important role of the areas under current research. Specifically, the secondary lines considered with a touristic vocation are:

- LA FERROVIA DEL TANARO: LINEA CEVA-ORMEA

  Km: 35; Construction date: 1889-1893; Closure: 2012; Reopening for tourism: 2016

- LA FERROVIA DELLA VALSESIA: LINEA NOVARA-VARALLO SESIA

  Km 54,1; Construction date: 1881-1896; Closure: 2014; Reopening for tourism: 2015

- LA FERROVIA DELLE LANGHE-ROERO, MONFERRATO:

  LINEE ASTI-CASTAGNOLE DELLE LANZE E NIZZA MONFERRATO-ALBA

  Km 58; Construction date: 1864-1870; Closure: 2012; Reopening for tourism: 2018

- LA FERROVIA DEL BASSO MONFERRATO: LINEA ASTI-CHIVASSO

- Km 51; Construction date: 1912; Closure: 2011; Reopening for tourism: 2022

In addition to that, other milestones have been crucial for the development of railway tourism in Italy (fig. 23). The legislative expansion with Law No. 128 of August 9, 2017, "*Disposizioni per l'istituzione di ferrovie turistiche mediante il reimpiego di linee in disuso o in corso di dismissione situate in aree di particolare pregio naturalistico o archeologico"*[46] enabled the definition of an initial list of 18 tourist railway routes. This law also regulated railway transport with historic trains, established guidelines for the provision of tourist transport services, and set rules for the use of railbikes. This was the result of a joint effort between institutional actors like the FS Foundation and local associations dedicated to preserving railway heritage.

Additionally, the previously mentioned impact of COVID-19 in promoting local tourism and the launch of the Extraordinary Plan for Tourist Mobility (MIT 2020) underscored the crucial role of railway tourism within the broader scope of Italy's tourism potential, alongside initiatives like historical walking paths and cycle routes.

Finally, in 2023, the new company "FS Treni Turistici Italiani" was launched by the Ferrovie dello Stato Group, with the goal of offering "vacation experiences dedicated to high-quality, sustainable, and slow tourism" through customized carriages, "distinctive travel services, and highly attractive tourist destinations."

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[46] "Provisions for the establishment of tourist railways through the reuse of disused or decommissioned lines located in areas of particular naturalistic or archaeological value,"
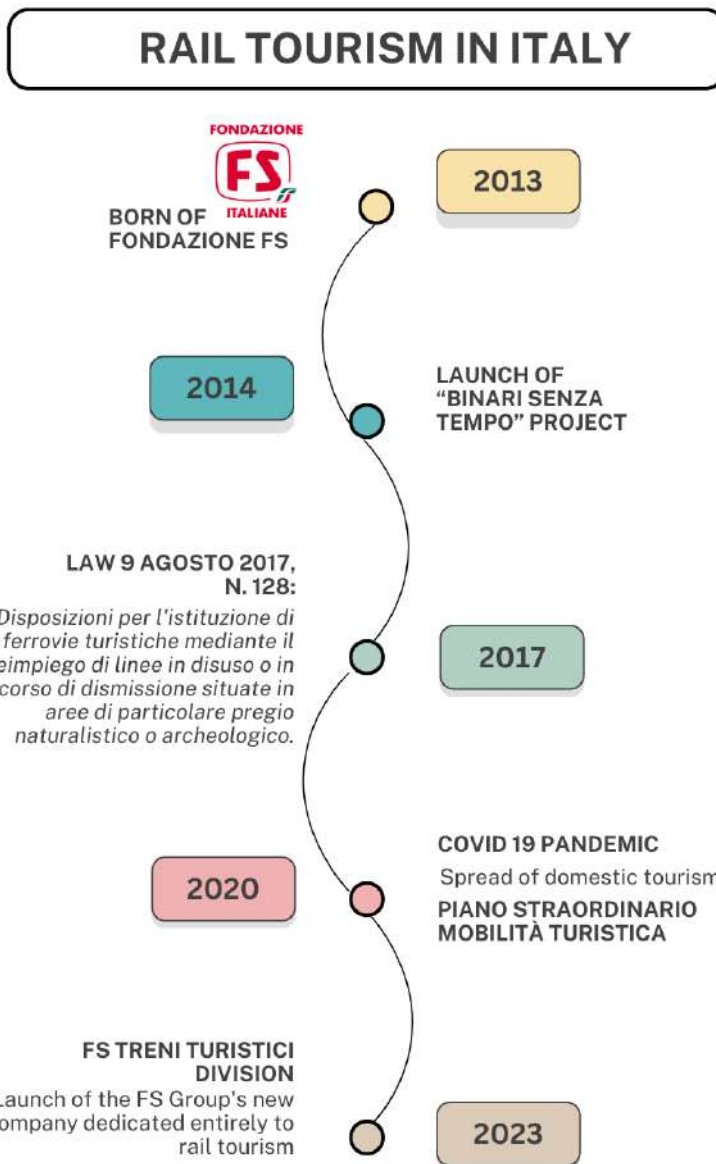
Figure 23: Rail tourism timeline. Authors elaboration

As seen, in addition to the railway actor, Gruppo FS through the FS Foundation, several ministries are crucial in the process. First and foremost is the Ministry of Cultural Heritage, which has been an "institutional member" of the FS Foundation since 2015, but also the Ministry of Tourism and the Ministry of Transport play important roles. Beyond institutional actors, other stakeholders such as the Confederation for Soft Mobility (COMODO) and the numerous railway associations scattered across Italy. These associations—focused on various missions such as museum activities, cultural heritage preservation, model railroading, local promotion, and even commuter advocacy—have found in the FS Foundation a key interlocutor, especially when dealing with disused or at-risk railway lines.

The territorial linkage process highlighted is twofold: on the one hand, these associations are gradually institutionalized through collaboration with the FS Foundation, working together on events in their area, particularly concerning rolling stock and materials. On the other hand, the FS Foundation represent for them an institutional channel for advocacy, representing territorial demands and pressures regarding both tourist and non-tourist lines.

To sum up, the role of tourist railways within the framework of secondary lines, as seen, is far from negligible not only due to the growing demand surrounding the phenomenon, but for other reasons as well. First, as briefly outlined, there is the potential to create networks and coalitions of interests among actors operating at different scales. This does not solely address the demand for railway tourism but, through the increasing popularity of railway tourism, also mediates the desires, needs, and aspirations of everyday mobility in the touched areas.

The relationship between secondary lines and tourist railways thus presents both opportunities and challenges: on the one hand, the advantages tied to funding, economic interests, and the various hopes behind the maintenance or reopening of a suspended line; on the other hand, the risks associated with an exclusively touristic focus for these lines, and the difficulty of bridging the gap between *ordinary* territories, such as intermediate areas, and the *extraordinary* nature of a historical or tourist train.

The work of the FS Foundation on minor and redeveloped railway lines is carried out in coordination with other projects led by Gruppo FS and RFI and it is part of the broader initiative *Support for Communities and Territorial Development*.

In this context, the second part of this paragraph focuses on the role of smaller stations in intermediate areas, particularly in relation to tourism processes.

The crucial role of stations as central to the needs of people and visibly integrated into the territories is well established. On the one hand, central stations become «places offering an innovative mobility proposal, at the heart of an integrated mobility project, hubs of a MaaS (Mobility as a Service) system, with spaces and services designed to facilitate fast, easy, intuitive, and seamless transitions between different modes of transport, while also serving as vital centers of smart cities, fully integrated into the urban framework» (MIMS 2021).

For smaller, less visited stations, however, different paths are possible. Where these stations are located in tourist areas, they can serve as tourism hubs, «usefully repurposed for sustainable tourism». This can be achieved by encouraging the use of station spaces for services that promote tourism (e.g., info points, sales of local products, hospitality services, amenities for cycle tourists, etc.), as well as using outdoor areas for intermodal services dedicated to tourism connections (e.g., shuttles, bike rentals, etc.).

The following map highlights the geography of stations with the greatest potential for sustainable tourism, according to the Ministry of Transport (2021).

Map 53: Map of stations with the greatest potential in terms of sustainable tourism. Source: Mims 2021 p. 98

On the other hand, not all minor stations are located within an area with a tourist vocation or in the vicinity of essential services or relevant points of interest, for which the evaluation of closure is suggested «with a view to the economic sustainability of the railway system - by proposing to the local authorities the use of station premises on loan for alternative activities (non-profit associations, etc.)». Following map highlights the stations with low potential detected.
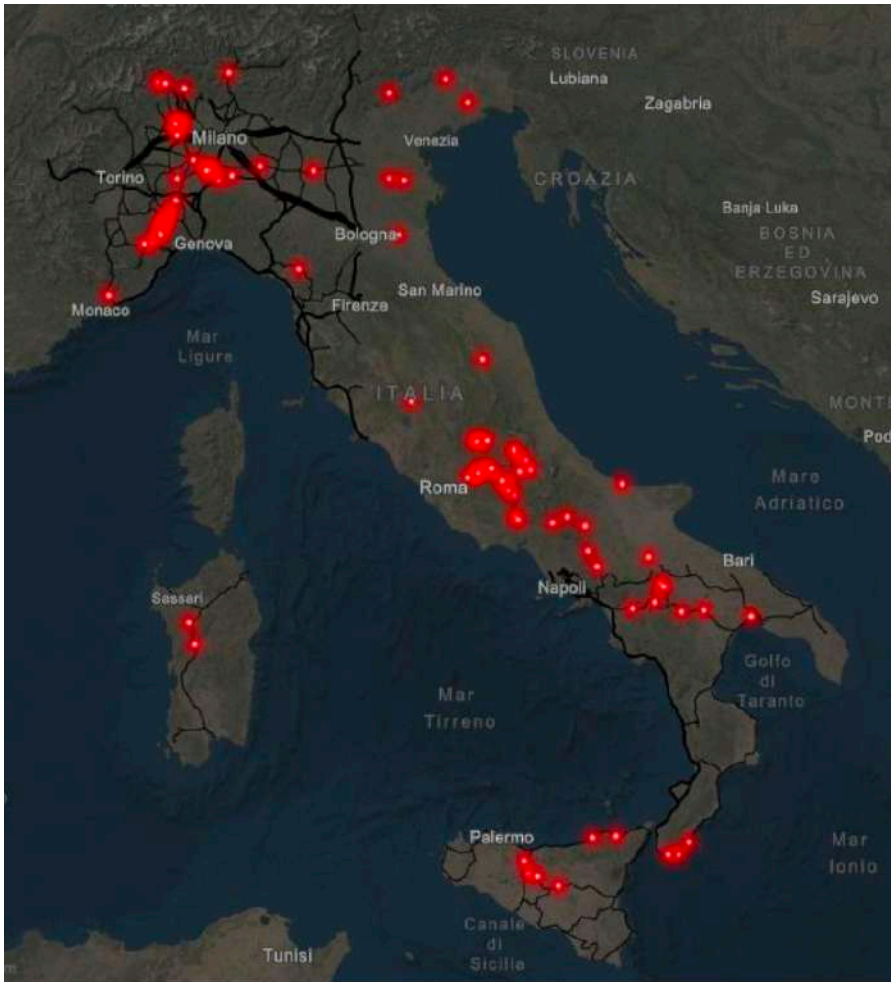
Map 54: Map of low-potential station Source: Mims 2021 p. 99

In addition to these two cases, the "Territorial Stations" (*stazioni del territorio*) project by Gruppo FS is also noteworthy. This initiative targets municipalities with populations under 10,000 and aims to transform stations into multiservice hubs, positioning itself as a driver of territorial development.

In other words, the objective is formalized as «transforming stations from simple transit points into centers that bring together services for the community and the region» (Sustainability Report, Gruppo FS 2023).

Beyond a clear focus on proximity healthcare services, the hub will serve as a point of attraction for local populations, offering a new adaptable station model tailored to various needs. These stations will provide multifunctional services, such as spaces for co-working and training, e-commerce pickup points, the installation of electric vehicle charging stations, and the development of photovoltaic systems.

Figure 24: Aims of the project "stazioni del territorio". Source: Gruppo FS 2023

To sum up, this paragraph has explored the connection between secondary railways and railway tourism within the context of intermediate areas, where this link becomes most visible. It has provided an overview of the strategies, actors, processes, and interests at play. This analysis has highlighted how the territorial role of railway actors has been rapidly reconfiguring in recent decades and how the broader transformation of the railway sector, as discussed in previous sections, also includes key elements such as tourism.

In other words, the paragraph has emphasized the growing importance of the tourism sector as a strategic and significant area for railways, and how this phenomenon finds fertile ground for expression and development in intermediate contexts and secondary lines. In this regard, the discussion has focused on the actions and narratives shaping the renewed territorial role of railway actors and how these dynamics unfold in intermediate areas.

Lastly, it is important to underline the crucial role of the FS Foundation as a "mediator" in the process, particularly in its relationships with networks already engaged in preserving railway heritage. This relationship further illustrates how the stories of ordinary and extraordinary railways are intertwined, often in ways that are not easily distinguishable.

6.6.2 A new season for Italian railways in the sustainability turn

> Questo approccio intende promuovere la coesione, ridurre le disparità regionali, migliorare la connettività e l'accesso al mercato interno per tutte le regioni. Aggiungendo risorse a progetti già esistenti e accelerandoli, nonché introducendone di nuovi collegati alla strategia di infrastrutturazione del Paese (#Italia Veloce), gli investimenti ferroviari inseriti nella Missione 3 del PNRR – integrati con quelli previsti dal relativo Fondo Complementare ex art. 4 DL. 59/2021 – puntano a realizzare e completare opere che fanno parte di progetti infrastrutturali europei o che colmano gap penalizzanti per lo sviluppo economico del Paese e, in particolare, del Mezzogiorno e delle Isole (Gruppo FS 2023)

As previously mentioned, railways—especially in their local and regional dimensions—are now at the center of renewed attention across many sectors. This growing interest is clearly demonstrated by the fact that more than half of the infrastructure and mobility interventions within the Italian PNRR are dedicated to railway infrastructures. Therefore, it is impossible to provide a comprehensive description and analysis of Italy's railway sector without acknowledging the crucial role railways play within the framework of the National Recovery and Resilience Plan (PNRR) and, more broadly, within the Next Generation EU initiative.

While the full impact of these developments will only become evident in future literature, several authors have begun to analyze the role of railways in PNRR investments, as well as the PNRR's role in boosting the railway sector in Italy. These studies cover a range of perspectives, including European comparisons of member states' actions (Pavanini and Barbano 2021), governance processes (Beria and Pucci 2021), economic geography (Viesti 2021), territorial transformations (Corò, De Castri, and Scalera 2022), and the North-South divide (Bergantino 2022). This section aims to outline the main challenges through an analysis of literature and reports from key stakeholders involved.

As highlighted, the railway sector plays a pivotal role within the PNRR, not only through significant incentives for sustainable mobility, but also because sustainability is positioned as a core principle at both the national and international levels.

The PNRR is defined as an extraordinary national plan for investments and reforms, strategically aligned with the goals of the Green Deal. It addresses the so-called twin transitions—ecological and digital—while also responding to the health crisis and managing the "imposed transition" that resulted from it. A central cross-cutting priority of the plan is the reduction of inequalities and territorial disparities, considered essential for the successful implementation of the investments. In essence, the PNRR was designed to address long-standing structural delays and imbalances in the country, with the aim of initiating a new phase of economic and social development (Fregolent and Savino 2023).

The role of sustainable mobility within the PNRR is not merely symbolic but translates into substantial investments. In fact, one out of six missions (which increased to seven with the 2023 update) is entirely dedicated to "Infrastructures for Sustainable Mobility." The PNRR is divided into six missions, further broken down into 16 components and 43 areas of intervention. The other missions are: 1. Digitalization, Innovation, Competitiveness, Culture (€49.2 billion); 2. Green Revolution and Ecological Transition (€68.6 billion); 4. Education and Research (€31.9 billion); 5. Inclusion and Cohesion (€22.4 billion); 6. Health (€18.5 billion).

Mission 3, which is most closely related to the railway sector, aims to modernize, digitalize, and make Italy's infrastructure system more sustainable by 2026, in line with the European Union's goals for decarbonization and sustainable development (Bergantino 2021). In terms of mobility investments, the objectives are not only to develop more sustainable transportation for decarbonization, but also to use transportation as a lever for improving overall quality of life—by reducing air and noise pollution, decreasing congestion, and integrating new services (MIMS, 2021). Another key objective is to reduce territorial inequalities by improving accessibility across different regions of the country.

To achieve these goals, significant investments are being channeled into the railway sector. In fact, the majority of PNRR investments aimed at sustainable mobility are allocated to the revitalization and development of railway infrastructure.

The railway sector is a key player in material infrastructure investments (Bruni 2021), given its strategic and financial importance within the PNRR. Alongside the goals of sustainability and accessibility, the sector plays a critical role in supporting the development of a more efficient and sustainable transport system. Moreover, it contributes to expanding international trade and enhancing the geopolitical positioning of the country, alongside other factors (Pavanini and Barbano 2021). Moreover, the decision to prioritize railways as a key investment within the PNRR is aligned with the role assigned to railway transport in the objectives set by the *Sustainable and Smart Mobility Strategy* (SSMS) proposed by the EU in 2020. This strategy aims to contribute to a 90% reduction in CO_2 emissions by 2050 and to complete the European single transport area, as outlined in the 2011 White Paper (Gruppo FS 2023).

Figure 25: "Expected benefits" Source: Sustainability report FS Group p. 33

Specifically, mission 3 is organised into MC 1 'Investments in the railway network' (i) and MC 2 with interventions aimed at the development of logistics.

Figure 26: M3 PNRR. Source: Sustainability report. FS Groupù

From an economic perspective, the total investments foreseen by the PNRR for Mission 3 amount to €25.4 billion, 13% of the total NGEU5 funds. To this must be added the financing from the National Complementary Fund, amounting to €6.06 billion, bringing the total funds allocated to Mission 3 of the PNRR to approximately €31.46 billion. If we consider other measures that also affect the transport

infrastructure sector, the total amount of resources reaches approximately €61.96 billion (Bergantino 2021).

As noted, the main objectives (Gruppo FS 2023) are the development and modernization of the national railway system, the strengthening of rail transport for long-distance freight, and the improvement of last-mile connections. This is implemented through the completion of the main high-speed and high-capacity railway axes, the greater integration of these with the regional railway network, and the safety improvements of the entire network. The content of the railway development plan can be summarized into 8 groups of projects, of which 3 are considered priorities (Beria and Pucci 2021), accounting for 90% of the planned railway investments, as follows:

1.   High-Speed Rail in the South

The interventions for the South concern, in part, 6 out of the 8 areas of intervention, of which 3 are specifically dedicated to the railway network. The first measure, focused on the railway network and allocated 18.7% of the NGEU funds dedicated to Mission 3, provides for the implementation of high-speed railway connections for passengers and freight to the South: this will reduce travel times and increase the capacity of the Naples-Bari, Palermo-Catania-Messina, and Salerno-Reggio Calabria routes.

2.   Completion of High-Speed Rail in the North

The second measure, allocated 34.6% of NGEU funds, concerns high-speed lines in the North that promise to increase rail connections with Europe, allowing for an enhancement of rail freight transport through an intermodal connection logic with ports, particularly the Brescia-Verona-Vicenza, Liguria-Alps, and Verona-Brenner lines.

3.   Rail Diagonals

The third measure, allocated 6.4% of NGEU funds, concerns diagonal connections: specifically, it is aimed at improving the cross-connectivity of the country's central-southern regions through diagonal and high-speed lines, reducing travel times for passengers and freight on the Rome-Pescara, Orte-Falconara, and Taranto-Metaponto-Potenza-Battipaglia routes. The fourth measure, allocated 12% of NGEU funds, concerns the development of the European Railway Traffic Management System (ERTMS), which is currently limited to a few railway sections and enables interoperability between European railway networks and performance improvements.

In addition to these, the following are included:

4) The development of the ERTMS technology,

5) The enhancement of metropolitan nodes and RFI (Italian Railway Network) lines, where are allocated 12% of NGEU funds. It concerns the enhancement of metropolitan railway nodes and key

national connections, with particular reference to border areas, central routes for port access, and the southern regions. The enhancement of stations as intermodal hubs and sustainable development poles is also planned, considering their role in the urban and territorial context.

6. Upgrading and improvement of RFI regional lines

The sixth measure, allocated 3.8% of NGEU funds, which aims to improve regional lines, highlights the particular attention paid to the southern regions in the context of integrating the lines with the national high-speed network. Finally, the seventh and eighth measures, allocated 9.7% and 2.8% of NGEU funds respectively, also devote particular attention to railway infrastructures in the South, with the objective of enhancing, electrifying, and increasing the resilience of these lines and improving stations in terms of accessibility and integration with the territory.

7. Upgrading and development of southern railway lines,

8. Upgrading southern stations

To these projects and investments is added the PNRR's intervention on regulation and reforms, which, in summary, pushes towards a process of simplification and speeding up procedures aimed at accelerating the organizational processes of railway, infrastructural, and more generally, public investments. It also aims to facilitate technological modernization.

Regarding the investments of Mission 4 Component 2 (M3-C2), this is primarily focused on intermodality and integrated logistics, with particular attention to the digitalization and modernization of the Italian logistics system, especially in the port network. The total investments amount to €3.76 billion, of which €3.13 billion come from the Complementary Fund. The interventions are concentrated in two main areas. First, Port System Development: This includes measures to simplify planning procedures, the implementation of regulations on port concessions, and the streamlining of authorization procedures, such as those for cold ironing installations (electrification of docks). Furthermore, actions are concentrated on Intermodality and Integrated Logistics, aiming at the digitalization of the logistics chain and the improvement of airport systems.

For a complete reference to the interventions related to infrastructure, transport services, and mobility, refer to Bergantino 2023, p. 83.

Considering the nature of the interventions, 75.6% of the funded works concern public works, 10.6% are investments that involve both the construction of infrastructure and the purchase of goods and services, 11.3% for the purchase of goods and services, while the remaining 2.5% provides capital contributions to companies in compliance with the regulations for "State Aid" (e.g., green navigation interventions/fleet renewal, sustainable mobility industrial supply chain, etc.) (MIMS, 2021).

However, the PNRR investments in sustainable mobility are not limited to M3 but can be traced throughout the entire plan. Below is a list.

In summary, the main policy choices of railway segment are highlighted (Pavanini and Barbano 2021): the gradual replacement of thermal engine vehicles with less polluting vehicles, the enhancement of the resilience and sustainability of transport infrastructures, research and development in the hydrogen sector, alternative fuels, and the creation of the related distribution infrastructures.

In the following tables, it is possible to find a recap of the interventions involving the Ministry of Transport (Tab 39 Bergantino 2023, p. 92) and a summary of infrastructure investments by transport mode (tab 38) (ibid., p. 99).

	Missione	Investimento	Descrizione	Risorse Pnrr
Investimenti	M2-C2	3.3	Sperimentazione dell'idrogeno per il trasporto stradale	0,23
	M2-C2	3.4	Sperimentazione dell'idrogeno per il trasporto ferroviario	0,3
	M2-C2	4.1	Ciclovie turistiche	0,6
	M2-C2	4.1	Ciclovie urbane	
	M2-C2	4.2	Sviluppo trasporto rapido di massa	3,6
	M2-C2	4.4.1	Rinnovo del parco autobus regionale per il trasporto pubblico con veicoli a combustibili puliti	3,64
	M2-C2	4.4.2	Rinnovo treni Tpl	
	M2-C2	4.4.2	Rinnovo Intercity al Sud	
	M2-C2	5.3	Supporto alla filiera dei bus elettrici	0,3
	M2-C4	4.1	Investimenti in infrastrutture idriche primarie per la sicurezza dell'approvvigionamento idrico	2
	M2-C4	4.2	Riduzione delle perdite nelle reti di distribuzione dell'acqua, compresa la digitalizzazione e il monitoraggio delle reti	0,9
	M3-C1	1.1	Collegamenti ferroviari ad Alta velocità verso il Sud per passeggeri e merci	4,64
	M3-C1	1.2 (sub. 1.2.1)	Linee ad Alta velocità nel Nord che collegano all'Europa (Brescia-Verona-Vicenza-Padova)	8,57

Table 38: Pnrr interventions and missions involving MIT. Source: Bergantino (2023)

Missione	Investimento	Descrizione	Risorse Pnrr
M2-C4-27	4.1	Semplificazione normativa e rafforzamento della governance per la realizzazione di investimenti nelle infrastrutture di approvvigionamento idrico	
M3-C1-1	1.1	Accelerazione dell'iter di approvazione del contratto tra Mims e Rfi	
M3-C1-2	1.2	Accelerazione dell'iter di approvazione dei progetti ferroviari	
M3-C1-21	2.1	Attuazione del recente «Decreto Semplificazioni» (convertito nella legge 11 settembre 2020, n. 120) mediante l'emanazione di un decreto relativo all'attuazione di «Linee guida per la classificazione e gestione del rischio, la valutazione della sicurezza e il monitoraggio dei ponti esistenti»	
M3-C1-22	2.2	Trasferimento della titolarità di ponti e viadotti delle strade di secondo livello ai titolari delle strade di primo livello	
M3-C2-1	1.1	Semplificazione delle procedure per il processo di pianificazione strategica	
M3-C2-2	1.2	Aggiudicazione competitiva delle concessioni nelle aree portuali	
M3-C2-4	1.3	Semplificazione delle procedure di autorizzazione per gli impianti di cold ironing	
M3-C2-10	2.2	Istituzione di una piattaforma strategica nazionale per la rete dei porti e interporti, al fine di sviluppare la digitalizzazione dei servizi passeggeri e merci	

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Missione	Investimento	Descrizione	Risorse Pnrr
M3-C1	1.2 (sub. 1.2.3)	Linee ad Alta velocità nel Nord che collegano all'Europa (Verona-Brennero-opere di adduzione)	
M3-C1	1.3 (sub. 1.3.1)	Connessioni diagonali (Roma-Pescara)	1,58
M3-C1	1.3 (sub. 1.3.2)	Connessioni diagonali (Orte-Falconara)	
M3-C1	1.3 (sub. 1.3.3)	Connessioni diagonali (Taranto-Metaponto-Potenza-Battipaglia)	
M3-C1	1.4	Sviluppo del sistema europeo di gestione del trasporto ferroviario (Ertms)	2,97
M3-C1	1.5	Potenziamento dei nodi ferroviari metropolitani e dei collegamenti nazionali chiave	2,97
M3-C1	1.6	Miglioramento delle ferrovie regionali (gestione Rfi)	0,94
M3-C1	1.7	Potenziamento, elettrificazione e aumento della resilienza delle ferrovie nel Sud	2,4
M3-C1	1.8	Miglioramento delle ferrovie nel Sud (gestite da Rfi nel Sud)	0,7
M3-C2	2.1	Digitalizzazione della catena logistica	0,25
M3-C2	2.2	Digitalizzazione della gestione del traffico aereo	0,11
M5-C2	2.3	Programma Innovativo della qualità dell'abitare - PinQuA	2,8
M5-C3	1.4	Investimenti infrastrutturali per le Zes	0,63
Riforme	M2-C2-37	5	Procedure più rapide per la valutazione dei progetti nel settore dei sistemi di trasporto pubblico locale con impianti fissi e nel settore del trasporto rapido di massa	-

	Missione	Investimento	Risorse totali	Risorse al Mezzogiorno	Amministrazione titolare
Rinnovo del parco autobus regionale per il trasporto pubblico con veicoli a combustibili puliti	M2-C2	4.4.1	2.415	-	Mims
Mobilità ciclisitca (TOT)			550	275	
Ciclovie turistiche	M-2C2	4.1	400	200	Mims/Mite
Ciclovie urbane	M2-C2	4.1	150	75	Mims/Mite
Porti (TOT)			3.760	1654,4	
Green ports	M3-C2	1.1	270	-	Mite
Sviluppo accessibilità marittima e resilienza delle infrastrutture portuali ai cambiamenti climatici	M3-C2	1.1	1.470	-	Mite
Aumento selettivo della capacità portuale	M3-C2	1.1	390	-	Mite
Ultimo e penultimo miglio ferroviario-stradale	M3-C2	1.1	250	-	Mite
Efficientamento energetico	M3-C2	1.1	50	-	Mite
Elettrificazione delle banchine (cold ironing)	M3-C2	1.1	700	-	Mite
Investimenti infrastrutturali ZES	M5-C3	1.4	630	630	Mimms/Pcm/ Min. Sud e Coes. Terr.
Intermodalità e logistica integrata (TOT)			250		
Login Business (Dotazione digitale e tecnologie abilitanti per le imprese nazionali di trasporto merci e logistica	M3-C2	2.1	175	-	Mims coordinato con Adsp e Pln
Login Center (Cabina di regia per la digitalizzazione della catena logistica nazionale)	M3-C2	2.1	30	-	Mims coordinato con Adsp e Pln
Reti portuali e terminal merci	M3-C2	2.1	45	-	Mims coordinato con Adsp e Pln
Aeroporti (TOT)			110		
Digitalizzazione manutenzione e gestione dati aeronautici	M3-C2	2.2	30	-	Mims coordinato con Enav
Digitalizzazione della gestione del traffico aereo	M3-C2	2.2	80	-	Mims coordinato con Enav

	Missione	Investimento	Risorse totali	Risorse al Mezzogiorno	Amministrazione titolare
Ferrovie (TOT)			26.666	10.213	
Alta velocità	M3-C1	1.1 - 1.2	13.210	4.640	Mims coordinato con Rfi
Connessioni diagonali	M3-C1	1.3	1580	1580	Mims coordinato con Rfi
Sviluppo del sistema europeo di gestione del trasporto ferroviario	M3-C1	1.4	2.970	-	Mims
Potenziamento dei nodi ferroviari metropolitani e dei collegamenti nazionali chiave	M3-C1	1.5	2.970	-	Mims
Ferrovie regionali	M3-C1	1.6	936	692,64	Mims
Upgrading, elettrificazione e resilienza delle ferrovie nel Sud	M3-C1	1.7	2.400	2.400	Mims
Miglioramento delle stazioni ferroviarie nel Sud	M3-C1	1.8	700	700	Mims
Sperimentazione dell'idrogeno per il trasporto ferroviario	M2-C2	3.4	300		Mims/Mite
Sostituzione treni diesel con treni a emissioni zero	M2-C2	4.4.2	800		Mims
Rinnovo parco treni regionale per il trasporto pubblico con veicoli a combustibili puliti	M2-C2	4.4.2	800	200	Mims
Strade (TOT)			1421,32		
Monitoraggio tecnologico opere d'arte stradali	M3-C1	-	450		Mims
Sperimentazione dell'idrogeno per il trasporto stradale	M2-C2	3.3	230		Mims/Mite
Sviluppo infrastrutture di ricarica elettrica su autostrade e centri urbani	M2-C2	4.3	741,32		Mims
Mezzi di trasporto pubblico (TOT)			6315		
Bus elettrici	M2-C2	5.3	300		Mims /Mise/Mita
Sviluppo del trasporto rapido di massa	M2-C2	4.2	3.600		Mims

Table 39: Summary table on infrastructure investments by transport mode (PNRR measures relating to infrastructure [missions 2, 3 and 5]). Source: Bergantino (2022 p. 99)

As reported in Tables 38 and 39, the overall framework of investments under the responsibility of the MIMS (Ministry of Infrastructure and Sustainable Mobility) by type of intervention shows a clear predominance of investments in railway infrastructure (about 55%), followed by 7% for local public transport, and 6% and 4% for port and road infrastructure, respectively. An important item is the capital contribution for vehicle renewal across all modes, accounting for about 11% of the total resources. Marginal items include cycling infrastructure, airports, and logistics, in addition to 16% for non-transport infrastructure.

Why are railways so important in the PNRR? The concentration of resources and investments in the railway transport sector stands out as a unique feature in the European landscape of mobility investments linked to Next Generation EU (Pavanini and Barbano 2021). Indeed, comparing the plan with international choices, it can be seen that the modal distribution of investments abroad is more heterogeneous, with investments more evenly distributed across different transport sectors (Hindriks et al. 2022; Pavanini and Barbano 2021). Although interventions such as electrification, general line upgrades, infrastructure digitalization, and the purchase of next-generation rolling stock are interventions that concern the railway sector across the board.

The reasons for the predominant role of railways in Italian investment choices are manifold and add to those already highlighted. eria and Pucci (2021) report three prevailing criteria for selection. Firstly, railways align with the principle of sustainability supported by the plan, in line with the DSNH (Do No Significant Harm) principle defined by EU Regulation 2020/852 (the so-called Taxonomy Regulation), according to which an economic activity is sustainable if it contributes to at least one of the six environmental objectives set by the same Regulation without causing harm to the remaining environmental objectives. Railways meet many of the current transition expectations, especially from a climate perspective, responding to the decarbonization challenges indicated by the European Union through the strategies linked to the European Green Deal and contributing to the achievement of the Sustainable Development Goals (SDGs) identified in the United Nations Agenda 2030. They also play a role in reducing social and territorial inequalities.

Another key principle that has guided the choices is the so-called readiness, meaning immediate project feasibility. Only projects already present on government agendas and in the infrastructure investment portfolio could meet the tight timeline required by the PNRR, which has a 2026 deadline. This made RFI (Italian Railway Network) a key player in the process and a privileged recipient of sustainable mobility funds. The final criterion relates to the need for investments to be widely distributed territorially, with a specific focus on Southern Italy. Railways thus become an optimal policy in this sense, as they represent a systemic investment both at the national level and locally,

addressing specific contextual needs (allowing, for example, 40% of the funds to be allocated to the South).

FS Group in the PNRR Economy

The FS Group has been called to play a fundamental role in the definition and implementation of the PNRR and the PNC. To date, €26.39 billion of funds have been allocated to FS Group companies—as implementing bodies and intervention managers—of which €24.8 billion (94%) in total (net of the impacts of the target rescheduling) have been allocated to RFI. The breakdown is as follows:

• €24.29 billion related to Mission 3: Infrastructure for Sustainable Mobility, Component 1, allocated for the development and enhancement of the national and regional railway network;

• €0.23 billion related to Mission 1: Digitalization, Innovation, Competitiveness, Culture, and Tourism, Component 3;

• €0.08 billion related to Mission 2: Green Revolution and Ecological Transition, Component 2;

• €0.24 billion related to Mission 5: Inclusion and Cohesion, Component 2 and Component 3.

Box 11: FS Group in the PNRR Economy

2023	16.423
2022	11.269
2021	12.537
2020	8.952
2019	8.499
2018	7.485
2017	5.625
2016	6.018
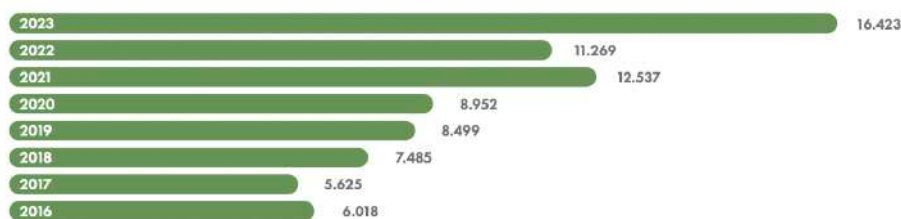
Figure 27: FS Group investment (Milion €) Source: Sustainability report (2023 p. 30)

From the perspective of the expected objectives of the railway sector, the large investments committed to the railway sector are part of the commitment signed between the ministry and the railways toward a just transition (Gruppo FS 2024).

As for the railway mode, the medium- and long-term planning defined in the PNRR and in current economic programming foresees a strong development of rail transport. The expected objectives focus on reducing greenhouse gas emissions and pollution, particularly in cities, but also on reducing territorial inequalities in terms of infrastructure and mobility services. This is outlined in terms of increased accessibility to the network thanks to planned investments, as highlighted by the maps (map

55) reported in the strategic document of the Ministry of Infrastructure and Transport titled "Sustainable Mobility and Logistics: Analysis and Strategic Directions for the Future" from October 2022, where the projected changes in railway accessibility across various provinces are illustrated.
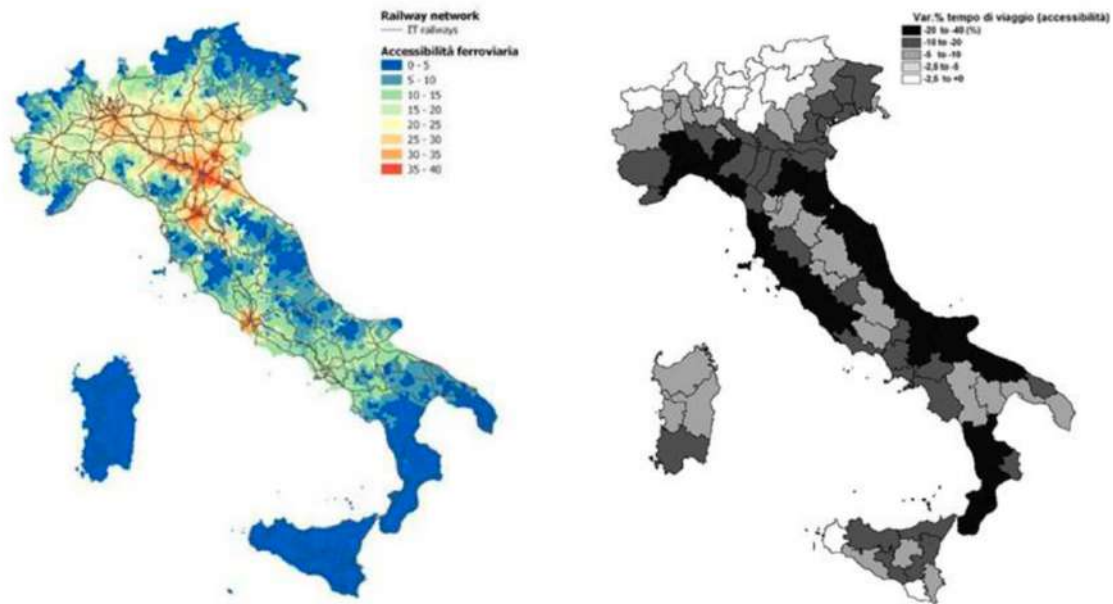
Nota: Nella carta a sinistra sono rappresentati i livelli di mobilità di medio lungo raggio offerti dalla rete ferroviaria italiana mediante l'analisi dei tempi di viaggio minimi offerti e in particolare calcolando il tempo medio per raggiungere, da ciascuna potenziale origine, il resto dell'Italia. Nella carata di destra è rappresentata l'accessibilità ferroviaria misurata in termini di tempo medio di viaggi ponderato per le diverse Province.

Map 55: Accessibility of the railway system (left) and percentage change in NRP impacts (right). Source: Sustainable mobility and logistics: analysis and strategic directions for the future, MIT, 2022

As highlighted by the maps, the areas of the country currently less accessible by railway infrastructure (such as the Adriatic corridor and the upper Tyrrhenian line, in addition to the Ligurian area and the connections with Calabria and Sicily) will benefit from a significant reduction in average travel times by rail.

To conclude, the Italian railway system has benefited substantially from the PNRR's interventions, allowing a renewed planning capacity at different scales, evident from the data reported, as well as being returned to the forefront of government agendas. Neverheless, som limits are also highlighted in literature. Regarding the general approach towards mega projects, the governance and the durability of the investments.

First, there is a general consensus on the benefits in terms of social and territorial equity related to railway development. However, the conception of infrastructures presented by the PNRR reflects a top-down approach to infrastructure investments. While these investments address territorial needs by being geographically distributed across the peninsula, they do not fully align with the territorial principle of integration with the local context, whether from the perspective of planning, the involvement of local actors, or the integration with other mobility services. More broadly, there is an emphasis on the lack of involvement of various players, each with different vocations and capacities, who could contribute to the development of the railway system. Projects are thus conceived as isolated initiatives within a broader set of general objectives, rather than being understood in relation to the multiple scalar levels to which they necessarily belong.

In light of this, the second limitation concerns the missed opportunity to establish new forms of infrastructure governance that would combine land use and transport policies, which remain separate spheres of intervention. In other words, the reform process initiated by the PNRR focuses solely on simplifying procedures, rather than strengthening opportunities for integrated, multi-level governance.

Summarizing these two points, the authors highlight that the conception of infrastructure, as conveyed by the plan, does not fully enable the capacity to generate added value for the territories through individual investments. In other words, the difficulty in "territorializing the plan" is emphasized. The third point concerns the long-term durability of the investments, and the heritage they will leave in terms of maintenance and management, as well as the limitations imposed by the rapid pace of planning and spending required for the extraordinary funds.

Another limitation, which closely relates to the topics of this study, lies in the risk of hyper-localization of the benefits arising especially from the secondary railway system's redevelopment. Rather than generating systematic benefits, these improvements may become exclusive to specific communities, increasing the risk of creating a widespread yet inefficient system in the long run (Beria and Pucci 2021).This raises interesting questions. As it is well-documented in the literature that smaller and secondary railway lines tend to be cost-inefficient due to their smaller and more dispersed demographic catchment areas, making them less attractive compared to private vehicles. Are these lines therefore destined to be overtaken by other modes of transport? To understand this, it is essential to examine the evolution of demand more closely. Indeed, among the reasons for the closure and suspension of minor lines are factors such as low passenger numbers, insufficient maintenance, and irregular or limited service (table 25). It will be important to assess how demand responds to new

investments, the improved service offering, and the overall restoration once the PNRR investments have taken root. Secondary railway lines represent an ambiguous subject whose political potential, representation, and presence within the multi-scalar landscape cannot be overshadowed by technical evaluations alone. This brings into play the nexus between territorial representation and voice in intermediate areas and the role of the railway system. On one hand, the representational potential of intermediate areas is significant and is linked to their political, economic, and social capacity to gain recognition within complex scalar scenarios. The issue of representation is also tied to the ability of intermediate areas to direct infrastructural change, whether from the perspective of institutions and economies or from the social standpoint of residents and users.

Table 40: Suspension, reactivation process. Elaboration of the author

ACTIVE SECONDARY LINE	SUSPENDED SECONDARY LINE	RE – ACTIVATED SECONDARY LIVE
FEW PASSENGER LITTLE MAINTENANCE LITTLE OFFER IRREGULAR OFFER LITTLE CONFORT	MODAL SHIFT	INVESTMENTS MAINTENANCE RESTORING SERVICECS

WHICH ARE THE BEAHVIOURS OF THE DEMAND?
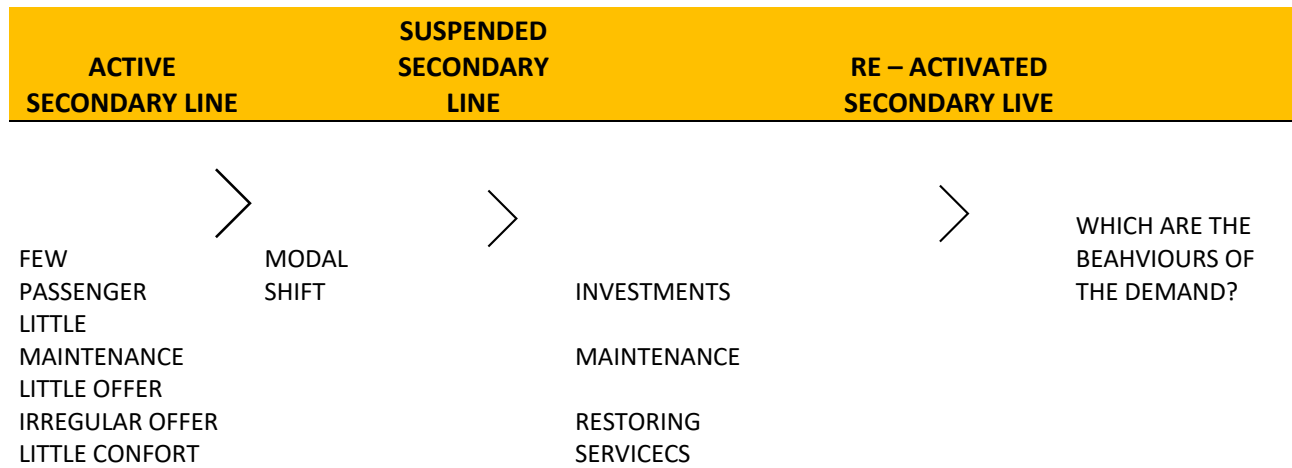
6.7 SUMMARY OF THE CHAPTER

Chapter 6 provided a portrait of the railway sector transformation occurred in Italy, highlighting the main actors involved and their relevance for the functioning of the sector. This portrait attempts to understand the multi-level and multiscalar presence of players involved, offering an idea about relations, history, numbers, geographies, territorial capacity, tools and main challenges.

Clearly, different kind of actors are involved readable from the political, economical, operational and technical point of view. A socio-territorial analysis is then relevant in order to understand these intertwined levels in their complexity, investigate their territorial, geographical and local scope and social implications. As emphasized in Chapter 2, infrastructure simultaneously mobilizes multiple levels of decision-making, which in turn affect different formal and informal spatial scales, with consequences for practices in space. What we have seen theoretically is tangible and visible in the case of railway operation. Moreover, this chapter attempted to re – read the railway infrastructural sector in the light of their analytic re - center in the mobility system of last years (cfr. 6.6.1, 6.6.2).

Moreover, this chapter can be read also differently. First it answers to the need of a reconstruction of relevant facts in a fast-changing sector: in few decades the scenario undergone a crucial transformation of which can be difficult to keep the track. This chapter, in this sense, tried to map and describe this according to different kind of sources. Scientific literature on the topic indeed, need to be combined with institutional reports, and official communication channels.

This led to the third topic of this summary that regard the representational dimension of the infrastructural sector, how the infrastructure speak and think about itself and which are the voices involved in this discourse.

 The interest on unpacking the railway sector in Italy can be traced back to the purpose of an *ethnography of infrastructure* (chapter 2.1.3) in theoretical chapter of the thesis, in the aim of turn the invisible (more) visible.

There are other elements that can be highlighted alongside this chapter.

In chapter 2.1.4 is mentioned how « infrastructure are meant to be modern, changing and progressive», at least symbolically. This chapter (and specifically 6.4) re frame in practice the non-synonymy of progress e modernism. On the other side, High speed, its development and flourishing answer and recall that enthusiasm of imagination (cap. 2.1.4 p. 62) by Mrazek (2002), that sense and feeling of promise kept at least for someone somewhere. Indeed, as last paragraph (6.6) tried to frame, *may we live in interesting times* for railways. As mentioned, a new stream of interest towards rail

sector at least in terms of financing, political agendas, innovations and public discourse is underlined. This leads towards two relevant point. First, maybe already obvious, is that further research will be needed in order to capture the extent of this promising season and if at the railway centrality in government agendas will correspond to a renewed centrality in 'people's lives' by enabling, at least for its concerning part, a less car dependent system of mobility.

The second point focuses on the happening in practice of the accelerations of the transformations. Indeed, assumed that transformation is constant and the evident transition underway highlights the different speeds at which it occurs and what it brings with it. From the brief overview presented, two accelerations in terms of the concentration of relevant events are underlined summarised and symbolized in 2012 and 2020 years. The first marks an acceleration in the shift from the railways of the past to the railways of the future, also involving the rewriting of geographies, timelines, and competencies. The second acceleration, 2020, concern the claimed urgency of ecologic transition, the investments, the discourses, the *readiness* and the strong need in the ground of visible changes.

Eventually, this reconstruction of relevant facts in railway sector deals with different stories whose roots can be find in the XIX Centuries, in the Risorgimento epoch, within and across states that no longer exist crossing decades and years. It is also a story from the Eighties and the *big* privatizations, the nineties and the approach to the word in a word always smaller. A changing scenario translated into ticket that change their price, their form and then become digital, relations reshaped, the advertising of the faster, more frequent and recognizable Frecciarossa[47]. Then, a leap: COVID, climate change, bicycles, the 15-minute city, proximity, and sustainability—fast and intense discussions once again. Everything becomes intertwined, as seen across four different temporal levels. The life of infrastructure and its implications are interwoven with the life of a person, their life rhythms, routines, and moments of transition. Building on this picture, the next chapter is introduced, where voices and bodies, moving at different speeds and with different styles and modes of transport, intertwine with the territory and the infrastructure.

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[47] Trenitalia commercial high speed launch (2009)
https://www.youtube.com/watch?v=rRo3AdlIQ50&ab_channel=Trenitalia90 last visit: 29/09/2024

CHAPTER 7 - PRACTICES OF MOBILITY: FOLLOWING THE RAILWAY MOBILITY STRATEGIES IN NORTHWEST ITALY.

7.1 METHODOLOGICAL INSIGHTS

The use of mobile methods reveals its potentiality more clearly at the micro level of the practices analysis in qualitative framework. Combined with the well-established tools of *qualitative* inquiry such as ethnography, interviews, observation and participant observation, following Urry (2007) suggestion about **mobile methods**, the research considered the *travel with* and the interview *while travelling/commuting* as crucial part of the methodological attempt. Moreover, other mobile tools used has been mobile methods ethnography, interviews, observation, participant observation, travel diary, life mobility maps. The micro scale of the practices of the actors (commuters, worker, travellers,..) allow indeed to see how these transformations happen in place. Analyzing railway sector and what happens in terms of practices, the *vector* is not considered exclusively as technical and material outcome but in their deep cultural, symbolic and meaning implications, that shape not only the people mobility patterns but also imaginaries, expectations and emergencies, the whole relation between people, infrastructures and territories. This is what guided most in choosing the whole qualitative methodologic approach.

In this research, I consider railway as a complex "field" where multiple layers and possible point of contact and force field exist. For example, this is translated in this research in not establishing an exclusive relationship with the institutional actors but taking care of all that "bottom up" point of access to the field. Starting from the triple perspective users, service, and environment, I considered a broad spectrum of possible respondents (interviewed) such as of course commuters, travelers but also retired workers, trade unions and associations. I considered the environment as well that revolve around railway - i.e. passionate, libraries, associations, modelist, people who participate in forum and social networks groups, that is not directly it but that at the same time produce knowledge about.

Following this approach, more than thirty semi structured interviews have been carried out, face to face directly in the people places of life or commuting. Observation along the whole research have been made in railway stations and in the trains, collecting notes. As mentioned, associations and public events had an important role in entering the field and gaining contacts for interviews and dialogues, in this sense some meetings of associations, public events – book launch, local events, historical train reenactments, visiting museums and locations of modeling associations have been

attended either by making explicit the role of researcher or not. Moreover, several data have been collected through social media such as Facebook groups and Whatsapp.

7.1.1 The sample and its characteristics

1. Choices on interlocutors
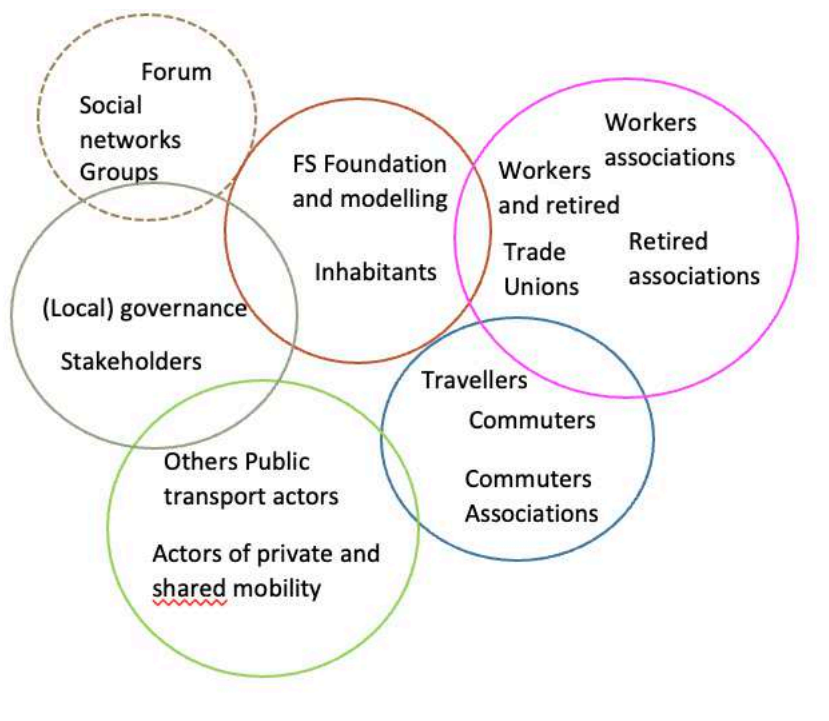
Figure 28: Typologies of actors involved

As mentioned in the introduction the qualitative part of the research attempted to reach the multiple voices behind the railway sector in all its parts. Figure above resume the kind of actors, gatekeepers, interlocutors that this work dealt with. The groups needs not to be considered as completely separated since some overlapping are present, for example an informant can be of course an inhabitant and a commuter and a retired from railway.

A snowball sample have been built, starting from people closer, relatives. A first exploratory stage of interviews has been carried with people closer and then expanded the network. Consideration was given to vary the sample in terms of demographics and origin. These aspects are particularly true for commuters that are widespread in the networks but less for the other selected informants. On the

choice of interviewing workers there was an ethical reasoning, in fact, in the end it was decided to interview either personnel belonging to associations and intermediate bodies or retired. This choice has also proved fruitful for the possibility of taking a long-term view of the railway's transformations, although it has the limitation of taking a limited and inward-looking view of the current generation change. The choice on relying on commuter, modelling, historical association it has been firstly instrumental in opening the field, making contacts and connections for interviews. Indeed, the interest on investigating the environment of railway associationism arise later during the field, looking at their activities, their organizations and claims. Indeed, at the same time an interest from them towards my work arrived directly, in order to gain voices in their activities and reasoning about for example the importance of secondary lines. Moreover, the research overlapped temporary with that important movement around local railway and revitalization in touristic scope seen in Chaper 6. Activities, interests, grow constantly around me while I was approaching the field. The context describes in latter paragraph of chapter 6 about a new flourishment around railway in intermediate areas accompanied the research on the side by providing insights and finding interest in the interlocutors. Of course, in this sense critical aspects on positionality needs to be taken in consideration. In fact, to avoid the risk of instrumentalizing the research work, I have always tried to keep a certain distance from the associations. Although I attended events consistently at least at an early stage of the research and interviewed the main people, I gradually left this research channel, although the so-called 'saturation of the field' was not reached. This choice was also dictated by reasons of gender and age. The railway association environment (in all its component) is in fact largely male, and the absence of age and gender proximity did not allow for a fully successful field.

Commuter as a unit of analysis is a quite dispersive label for approaching a relevant sample, not having defined more clearly the characteristic of this unit of analysis is a first limit of the sample that need to be improved in further research. On the other hand, due to the exploratory aims of the work I decided to leave the unit to be larger to have a sight, although partial, on several different perspective, territorial and social. In general, an attempt of the sample selection was to reach at least some people for category for each relevant node of the intermediate railway network. In this sense, the origin of the contacts has been an important discretionary element. The relevant nodes of the research and the sample characteristics are described in following tables. Each name has been anonymized in the analysis. Combined to the mapped interviews there are several informal dialogues that I had on the move, while travelling and at the stations.

Last aspect to be mentioned is that in addition to the list of interviews here reported there's the body of the first wave of research conducted between 2017 and 2019, mentioned in the first chapter. In that case in a smaller area have been performed 35 semi structured interviews. Some results emerged from

that research body are still relevant today and some of the questions here investigated are the result of that study. In two cases I conducted a second interview for the present study as a test for the list of questions and for "breaking the ice" of the field.

In the appendix there are three life mobility maps used during the interviews, additional material that I tested but at the end of the day the tool was no longer useful for the purpose.

Limits concerns as well the breadth of the selected area, in fact I have tried to systematise information from a large body of railway lines that can be traced back to the intermediate areas of piedmont. however, the breadth of the area did not sit well with the micro and ethnographic vocation of the methods. However, I stress first, how the same associative actors were simultaneously part of the same network that could be defined as 'of the intermediate piedmont', with frequent exchanges. Second, the railway lines as a mediator among multiple scales helped me as far as possible to maintain a multiplicity of gazes from the hyperlocal to the network system.

Codice identificativo	LUOGO	PSEUDONIMO	SESSO	TIPOLOGIA	Settore	ruolo/associazione	Materiali aggiuntivi
VC-MAR--A	Vercelli	Mara	F	Abitante	Utente	Abitante	
MI-GIUF89P	milano	Marta	F	Pendolare	Utente	pendolare	life mobility map
MI-ASSMOD	Milano	Luigi	M	Associazionismo	Multi	Associazione fermodellismo	
PC-ASSMC	Piacenza	Marco	M	Associazionismo	Multi	associazione giovanile	
CH-MARTG	Chivasso	*Martina*	F	Ambiente ferr	Servizio	commerciante stazione	
BL-LAUB--A	Biella	Marina	F	Altri attori mobilità	Servizio	imprenditore settore mobilità	life mobility map
BI-PAOF--P	Biella	Daniele	M	Pendolare	Utente	pres associazione pendolari	
VC-ALDR---	Vercelli	Sergio	M	Associazionismo	Abitante	storico ferrovie	
AT-NIC084P	Asti	Thomas	M	Pendolare	Utente	pendolare	life mobility map
BL-MARC93P	Biella	Michele	M	Abitante	Utente	biella abitante e pendolare	
PIE-COMIS	online	Nicola, Simon	M	Pendolare	Utente	Riunione associazioni	
AT-ALEG92P	Asti	Mattia	M	Pendolare	Utente	pendolare	
PIE-ASSMUS	Savigliano		M	Associazionismo	Multi	conservazione ferroviaria	
AT-FULB--P	Savigliano	Antonio	M	Pendolare	Utente	associazione pendolari	
BL-LORB--A	Biella	Alessandro	M	Altri attori mobilità	Servizio	sindacato	
TO-ESTM91P	Torino	Maria	F	Pendolare	Utente	Pendolare	life mobility map
AT-SILM--P	Asti	Alessia	F	Pendolare	Utente	servizio	life mobility map
ATMARD--F	Asti	Gianluca	M	Ferrovia	Servizio	servizio	
CM-GIUS91P	Online	Alice	F	Pendolare	Utente	pendolare	
RORFIMARV	Online	Matilde	F	Ferrovia	Servizio	Analista territoriale / ferrovie	
AC-SERP--P	Alessandria	Cecilia	F	Pendolare	Utente	Pendolare	life mobility map
VG-SELP--P	Voghera	Margherita	F	Pendolare	Utente	pendolare	
TNMICS93F	Milano	Lorenzo	M	Ferrovia	Servizio	ferrovia	
VS-SIMN80A	Varallo	Elia	M	Associazionismo	Multi	associazione ferroviaria	
MI-ANTA--F	Milano	Salvatore	M	Ferrovia	Servizio	associazione ferroviaria	
TNGIOV--F	Rovereto	Vittorio	M	Ferrovia	Servizio	servizio	
TNRENS--F	Rovereto	Cesare	M	Ferrovia	Servizio	servizio	
TNMICHT--F	Rovereto	Corrado	M	Ferrovia	Servizio	servizio	
MI-TOBA--P	Online / Cremona	Silvano	M	Pendolare	Utente	pendolare	
CM-MAUS--P	Online / Casale Monferrato	Jacopo	M	Pendolare	Utente	Pendolare	
CNCLAM--P	Online /Cuneo	Nicola	M	Pendolare	Utente	associazione pendolari	
TOANDI--P ;	Online / Torino	Simone	M	Ex Servizio	Servizio	associazione pendolari	
TOMARS--P	Online / Torino	Alessio	M	Ex Servizio	Servizio	associazione pendolari	
AT-DANM82P	Online /Asti	Camilla	F	Pendolare	Utente	Pendolare	
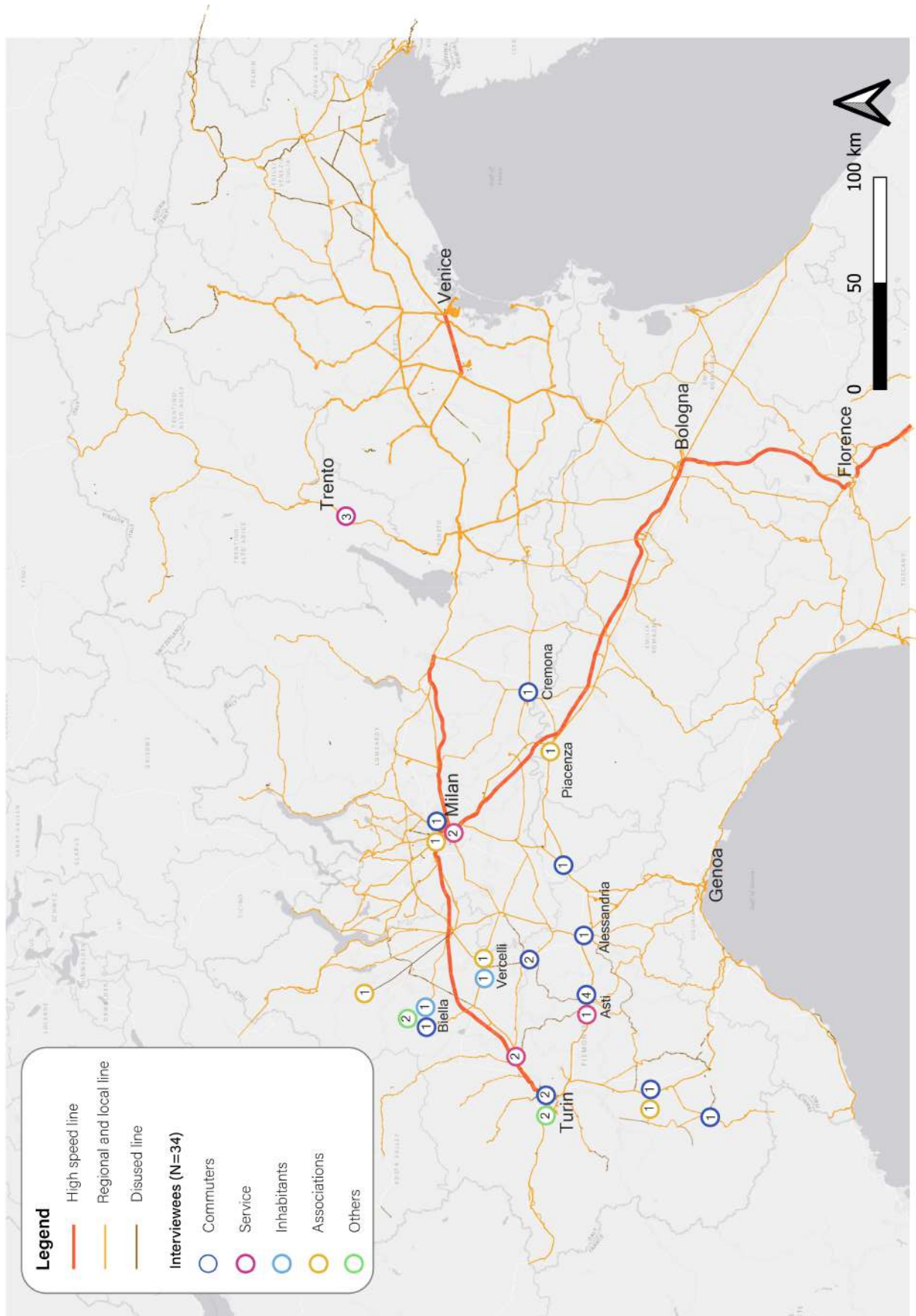
Map 56: Geographical distribution of interviews and typologies.

This last part moves around three main questions related to (1) how mobility practices are configured in contexts of multilevel transformations and (2) how in a context of transformation (territorial, infrastructural and socio economical) are renegotiated the practices and strategies of mobilities?

Different answers regarding different aspects are here provided.

7.2 USERS Infrastructural and mobility transformation from the perspective of users and the mobile strategies of users in a context or remodulation of the service or suspension of a railway line

The first level of the qualitative material analysis focused on the infrastructural transformation from the users' point of view, investigating strategies in a context of service remodelling and discontinuation. First, it is possible to distinguish between individual and collective strategies. Some diagrams will help in the explanation of the results.

INFRASTRUCTURAL TRANSFORMATION LEVEL

1) INFRASTRUCTURAL TRANSFORMATION FROM THE PERSPECTIVE OF "USERS"

RQ: WHICH ARE THE STRATEGIES OF "USERS" IN A CONTEXT OF REMODULATION OF THE SERVICE OR SUSPENSION OF A RAILWAY LINE?

COLLECTIVE STRATEGIES

- WHATSAPP GROUPS SOCIAL MEDIA INTERACTION
- SHARING OF PRACTICES
- PUBLIC EVENTS
- LOCAL COMUNITY ENGAGMENT
- DIFFERENT KIND OF ASSOCIATIONS
- ASSOCIATIONISM
- COALITION CREATION
- ADVOCACY AND PRESSIONS
- MOBILIZATION OF SHARED AND COLLECTIVE MEMORIES
- TERRITORY AS A RESOURCE
- LOCAL ACTIVISM

INDIVIDUAL STRATEGIES

- CAR USAGE
- MODAL CHANGE
- RELOCATION
- IMMOBILITY
- CHOICE OF NOT TO MOVE
- BIOGRAFICAL FRAME
- TRAJECTORIES OF LIFE

>>>

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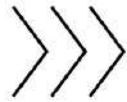
As it is possible to see in the figure, the answer is thus twofold, from the side of *individual choices* where different behaviors are highlighted: it is possible to see a modal shift to another mean of transport such as car and the private ones, or otherwise there's the strategical immobility: the explicit choice of not to move or move less. The individual pattern are thus investigated with the interesting biographical approach as it will be detailed later in the text.

On the side of collective strategies, it is possible to see different practices such as community creation and associationism (Community involvement through collective and shared memory). What is outlined is the emerging of formal and informal associations with different purposes: sharing information, practices, but also lobbing and advocacy towards different kind of actors: local institutions, railway actor in different parts: who manage the infrastrcture directly in order to find new solution on service but also to question the choices. The interest of formal and informal local associations, the interest of passionate people and former employees also leads to the second strategy which is the involvement of the local community through the mobilisation of a collective and shared memory about the withdrawn or suspended railway. This has led to a new interest on the part of the institutional actor FS Foundation (Chapter 6) with the creation of a special division for historical, museum and archive projects and the interest of these lines in tourism. This mobilisation of history and of the memory of the old or suspended lines came about simultaneously from above and from below: from below, local associations kept the memory of these lines and their territorial role alive with events, publications, etc., and the establishment of a foundation for historical, museum and archive projects by Ferrovie dello Stato accelerated this process and created a national network of railway associations (in which enthusiasts, commuters, etc. converge) and a the already seen common project *Binari senza tempo*.

What is emphasized by these associations is how keeping the memory of these suspended lines alive and emphasizing their importance also as a tourist vector can be a way of keeping the line active and clean while waiting for it to be restored to passenger service.

Within the association, however, there are not only users or former users of the lines but also railway passionate (who use other means of moving daily), which makes the analysis of these groups not free from bias. Following table give a sight on the main aspects here outlined.
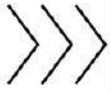
INFRASTRUCTURAL TRANSFORMATION LEVEL

1) INFRASTRUCTURAL TRANSFORMATION FROM THE PERSPECTIVE OF "USERS"

COLLECTIVE STRATEGIES

RQ: WHICH ARE THE STRATEGIES OF "USERS" IN A CONTEXT OF REMODULATION OF THE SERVICE OR SUSPENSION OF A RAILWAY LINE?

DIFFERENT KIND OF ASSOCIATIONS

ASSOCIATIONISM

WHATSAPP GROUPS SOCIAL MEDIA INTERACTION

SHARING OF PRACTICES

MEETINGS WITH MOBILITY STAKEHOLDERS

ADVOCACY AND PRESSIONS

COALITION CREATION

LOCAL COMUNITY ENGAGMENT

PUBLIC EVENTS

MOBILIZATION OF SHARED AND COLLECTIVE MEMORIES

WHAT HAS HAPPENED IN PIEDMONT IN TERMS OF MOBILITY?

LOCAL ACTIVISM

WHAT IS YOUR COMMUTING HISTORY?

WHAT ARE THE MAIN CHANGES YOU HAVE SEEN ON THE LINE YOU COMMUTE MOST FREQUENTLY? OR IN YOUR *COMMUTING CAREER*?

TERRITORY AS A RESOURCE

HAS THIS INTERACTED WITH YOUR LIFE AND YOUR MOBILITY CHOICES? IF SO, HOW?

«Here we found ourselves in 2016 one day, one evening, sitting at the --, with the Unione --, the Fondazione --, the various associations, and in the end it came out, after a series of meetings, two or three meetings, a report in which exactly the territory, as an industrial association, a travellers' association, asked for the identification and connections with Turin and Milan. That was brought to the political level, meaning to the regional political representative of the area, rather than to the member of parliament at that time, to the mayor, and he said, look, this is what the community wants.» (Michele)

In this quotation there's an example of process of the advocacy strategy, the interest on doing networks and building coalitions of interest among different kind of authors, obtaining visibility and political relevance. Indeed, the action of pression and advocacy regarding secondary railway line and mobility in Piemonte provinces is an important reference of the discourse that comes and goes during the whole period of the research, invisibile from the other scales, and from the other lines such as the main branches between Genoa and Turin or between turin and Milan.

On one hand, there are the responses, the collective strategies to respond to change, while on the other hand, there are the individual responses, which can be summarized in three main ways of reacting to change. First and foremost, the modal shift, whether imposed or collective, with the transition from train to road transport, or, in most cases, the shift to private vehicles. The following table summarizes the main aspects related to individual choices.

INFRASTRUCTURAL TRANSFORMATION LEVEL

1) INFRASTRUCTURAL TRANSFORMATION FROM THE PERSPECTIVE OF "USERS"

INDIVIDUAL STRATEGIES

RQ: WHICH ARE THE STRATEGIES OF "USERS" IN A CONTEXT OF REMODULATION OF THE SERVICE OR SUSPENSION OF A RAILWAY LINE?

RQ: HOW WAS THE INFRASTRUCTURAL TRANSFORMATION PERCEIVED BY USERS AND TRAVELERS?

RQ. WHAT ARE PEOPLE REPRESENTATIONS AND EXPECTATIONS RELATED TO MOBILITY AND RELATED INFRASTRUCTURE?

CAR USAGE

CAR USAGE

MODAL CHANGE

RELOCATION

IMMOBILITY

RETIREMENT

CHOICE OF NOT TO MOVE

WHAT IS YOUR COMMUTING HISTORY?

WHAT ARE THE MAIN CHANGES YOU HAVE SEEN ON THE LINE YOU COMMUTE MOST FREQUENTLY? OR IN YOUR COMMUTING CAREER?

HAS THIS INTERACTED WITH YOUR LIFE AND YOUR MOBILITY CHOICES? IF SO, HOW?

BIOGRAFICAL FRAME

WHAT IS YOUR COMMUTING HISTORY?

TRAJECTORIES OF LIFE

These aspects were also investigated through a biographical approach: in fact, infrastructural and territorial changes intertwine with life trajectories. Analyzing mobility careers, mobility choices throughout one's life, such as in a professional career, allows us to understand modal changes and life choices more broadly from a more complex perspective and allows for a more accurate contextualization of the outcomes mentioned above. In this sense, a long excerpt from an interview with Jacopo, a commuter between Casale Monferrato and Milan, is provided. He reflects on his commuting life from the 1970s to today (the interview was conducted in the spring of 2022). Without much prompting, Jacopo recounts in about ten minutes his journeys, the modes of transport, the routes, the timetables, and how these have intertwined with the events of his life: university in the beginning, the birth of his children, moves, telecommuting, and smart working, and finally, retirement."

FIRST PERIOD:

1976 – 1980 "prehistory"

Student at University in Pavia

Weekly commuter.

Son of railway worker: free ticket and potential modal choice driver

«With my father being a railway worker, practically when I was little, they already used to take me on train rides [...] My father even let his licence expire at one point, he only travelled by train. I went after him.»

Two options with one stop from Casale M. to Pavia:
1) Casale – Mortara – Pavia
2) Casale – Valenza – Pavia

Quality is quantity: «*a lot of option during the whole day, including Sundays*»
« *trains ran at all hours, including evenings*»

SECOND PERIOD **1984**

Worker, living in Milan but not in the same area of the workplace.

Coming back home once a week or in two weeks visiting the parents.

Rail options used:

1) Casale M. – Mortara – Milano Pta Genova
2) Cuneo – Milano an historical line:

«by the way, at that time there still existed, I remember well that I took it more than once, a historical littorina that left Cuneo in the morning, I think around 5 a.m. and arrived in Milan around 9 a.m., so it was a line, it did Cuneo, Asti, Casale, Mortara and Milan Porta Genova, so one sat on the train and arrived directly in Milan»

THIRD PERIOD **between 80's and 90's**

Worker in Milan, living in Pavia for 5 – 6 years.

Lower rent in Pavia than in Milan for the same travel time. Living with his wife (school teacher).

Everyday commuter

Modal choices:

1) Rail: Pavia – Milano Lambrate + company coach
2) Personal or company car: for atypical shift

Ticketing: Discounted prices

«There were still the famous season tickets for workers, in a sense that you travelled the whole week, I think, for the price of a couple of rides»

FOURTH PERIOD: **from 1994 – 95 – to 2020**

Worker in Milan,

Multilocal: main relocation in Casale M.

Second home in Milan used a few days a week.

Born of the two children

I settled here with the family, in the nineties, I was from Casale, the wife too, I have roots here, grandparents. Not least the fact that the quality of life in a small provincial town is always better, especially when there were children. In the end this choice was made, my wife had her job behind the house. I tried a bit to make do.

Weekly commuter

« I got into this world of weekly commuting, typically leaving on Monday morning, and returning home on Friday. Initially I also used to do a few stops in between, then at some point I gave up because it became progressively more inconvenient and more expensive. »

Ticketing: Less appealing and gradual strictness, subsequently kilometre tickets

1) «Those were the years when there began to be an increase in ticket prices and a gradual reduction.»

Modal choice: rail
1) Milano Pta Genova – Mortara – Casale M.
2) Milano – Vercelli – Casale M.
3) Milano – Valenza – Casale M. (few trains just on peak hours)

Three option and one ticket as a strength:

«The advantage at the beginning of these three options was that practically with a single ticket for the longest line one could decide at the last moment which way to go. Then there was at some point a progressive tightening up, perhaps first the reduction of trains or these ticket stiffeners, which gradually tightened up the system.»

First important changes **early 2000's**:
- Internet

«I used to decide maybe by casting an eye over the internet when it started to be, if there was some delay on one side, I would go on the other side, using this alternative a bit»

- Abolition of kilometre tickets and advance organisation duty combined with reduced rides

«I suffered a little from this inflexibility, because apart from the reduction in rides, even this strictness of tickets, when in our case of Casale where one could use more than one line»

- Growing difficulties with coincidences:

«In the sense that since the very concept of coincidence was abolished at a certain point, it happened that one would enter the station with the train from Milan, with the regional train, slightly late and see the train leave for Casale under one's nose.»

2010:

- Reduction of the offer
- Replacing trains with buses first during the summer period

«when it gradually began for economic reasons, after reducing the number of runs a little, it began in the summer period to replace trains with coaches».

- Complete replacement of the Casale - Mortara line with buses

Modal choice: rail
1) ~~Milano Pta Genova – Mortara – Casale M.~~
2) Milano – Vercelli – Casale M.
   Milano – Valenza – Casale M. (few trains just on peak hours

«I settled at that point either on Valenza or on the via Vercelli line, because if nothing else then if I had to travel in the morning or in the evening the Valenza line could be fine, in the sense that there were two or three trains, a couple of interesting combinations, either to go up or to come back in the evening. On the other hand, the other line, the one via Vercelli, was very interesting because from Milan to Turin there were trains practically every hour, so once one wanted to get to Vercelli, one had to go to the bank at 9 am, one wanted to get to the office later. Let's say that the only line left was to go to Milan with a certain flexibility of schedule, that is, not to do the classic office hours, when you get to the office at 8.30-9.00. So at that point…»

- Strengthen of the main rail axes (Milan – Turin) and progressive obligation of users towards those lines

2015:

- Relocation nearby the station
- New modal choice: direct bus Casale M. – Milan

  «I started to betray the State railways a little! »

*«Then I **slowly** discovered an alternative, which was a direct bus that runs between Casale Monferrato and Milan Famagosta. It leaves in the morning and returns in the evening. Obviously, this is the constraint because there is only one in the morning, but I found it quite convenient, because at the end of the day you get on it and have another nap.»*

- Rail and "national rail" as the main vector considered even in a context of closure and downgrading.

FIFTH PERIOD: 2019

Change in status: end of the multilocal living.

- *Telelavoro* (teleworking) for familiar care reasons and because of work seniority
- Moved out from the second home in Milan.
- Two/three times a week commuter

  Modal choice mixed:
- Direct bus: Casale M. – Milano Famagosta (+ green metro line)
- Full Rail: Casale M. – Valenza – Milano
- Rail + replacement bus Casale M. – Vercelli - Milano

«At that time, in 2019, I was already teleworking, there were family problems, at a certain point, seeing that I was approaching retirement, I asked for this telework formula, which we had, and since I had a very high score, in quotes, so given the distance, I began, let's say, to work 2-3 days at the headquarters and the rest at home, I left my home in Milan I began to travel 2-3 times a week using either this bus going to Famagosta or the Valenza route, or sometimes via Vercelli.»

Change (from 2013): replacement of the Casale – Vercelli rail with bus

«because since 2013, as you know, that Casale-Vercelli line has been de facto cancelled, using highway buses, quite fast, but they always continue at half an hour compared to the 18 minutes, I think, because the very old white and blue littorina of yesteryear, because the route is about 20 kilometres, I remember at the time there was a lot of protest precisely because of that, not so much because of the bus, the highway was also convenient, but it practically doubled the journey time, in the sense that to travel 20 kilometres by train it was easy to reach Vercelli in just over a quarter of an hour here you could make connections at the drop of a hat, with the bus clearly taking half an hour, plus clear 10-15 minute connections with the regional is more difficult»

SIXTH PERIOD: 2020

Covid 19 Pandemic, retirement end of the mobile career.

Passage from teleworking to smart working with rare trips to the office.

Modal choice: car

*«At that point I went straight to smart working the last few months before retirement, at the end of 2020, at which point those few times I went to headquarters **I was always in the car**, so let's say with covid I abandoned both the train and the bus. Also because let's say at that point we started rotating in headquarters with permanencies. The department had no more than 10-20% attendance. I was already equipped for telework, so **I was practically already doing almost everything from home,** except for a few little things I still had in the lab, so I was practically only going maybe two or three times on the fly […] Let's say I retired in 2020, I no longer used trains, maybe once or twice to visit colleagues, but not much more. That's kind of my whole life.»»*

Finally, it is interesting the summary of Jacopo mobile career as portrayed by himself:

«Let's say that I've seen a bit of the evolution of the railways, characterised precisely by this progressive reduction in the number of runs, tightening up on the way increases are made, and also difficulties. Elimination of some lines, which were perhaps first made to dry up, in the sense that it reduced the number of runs, then bom no longer runs, so we replace them with buses. However, I

have noticed that in other areas the trains have been maintained, I see for example in Alessandria and Pavia, there is still now, it makes all the villages, and I have the impression that Casale has been particularly penalised by the way it was before, where we had four or five lines, because there was the line to Alessandria, there was the line to Vercelli, there was the line on Mortara, there was the line on Vercelli, there was the line on Chivasso, and there is only the Vercelli-Casale-Chivasso route left there, but everything else is coaches and not even that frequent, apart from the Casale-Vercelli run there is one every hour, it seems to me that both on Mortara and Asti there is very little. .[...] what the system has been lacking a bit is flexibility, that's what has been missing, it has tried to improve the single segment, it has tried to improve the single segment, but for those who had to make changes, if they had to go to a city like Milan or go elsewhere, they felt lost »

A long extract from the interview is given here:

F.: If you could briefly tell me about your experience as a commuter, from when to when, which lines you used most frequently, how you got into commuting, why you always chose the train, and if you combined it with other means of transportation...

Jacopo: Let me share a bit of my story. Going back in time, I started systematically using the train as a weekly commuter when I was a student in Pavia. The first route I took was the Casale-Mortara-Pavia or Casale-Valenza-Pavia line, while I was a student from 1976 to 1980. At that time, I had two options to get to Pavia: one was via Mortara, where you would take a train on the Vercelli-Pavia line, a route that still exists today, and the other was via Valenza, where you'd catch the Alessandria-Pavia line. I mostly used the Mortara option, but sometimes I took the other. I was the son of a railway worker, so I used the special tickets that railway workers' children had, allowing us to travel for free. This first experience was characterized by a lot of options. I remember that on Sundays, there were so many trains that you could return to Pavia even in the evening. I lived in a dormitory in Pavia, and we often spent the week there, going home on Friday night and returning to Pavia by train after dinner on Sunday. Trains ran at all hours, even late at night. That's the "prehistory" of my commuting experience, more than 40 years ago.

After graduating, I left Italy for a few years and stopped using the train regularly, except for international trips. I returned to work in Milan in 1984 and initially lived in the city. I used to visit my family in Casale every week or every other week. At that time, I mainly used the Casale-Mortara-Milan Porta Genova line. I even remember taking a historic "littorina" train a few times, which started

from Cuneo at around 5 a.m. and arrived in Milan at 9 a.m., passing through Asti, Casale, Mortara, and finally Porta Genova. This train arrived a bit late, but it fit my flexible office hours at the time.

After a few years of this, I moved to Pavia and spent about five or six years commuting daily on the Pavia-Milan Lambrate line. These trains were very important because they ran on one of the main routes, Milan-Genoa, which was quite convenient. I chose to live in Pavia because, at the time, the place I found in Milan was on the opposite side of the city, near the Fiera district. So, in terms of travel time, it took about the same amount of time to get from Pavia to Lambrate by train as it would have taken to commute within Milan. I made this choice mainly for economic reasons, as rents were cheaper in Pavia. During those years, I mainly used the train unless I had to work odd hours due to my job as a plant engineer, where I had to manage systems running 24/7. In those cases, I drove, but during regular office hours, I always opted for the train. This was during the late 1980s and early 1990s.

Then I moved back to Casale around 1994-1995 after my second child was born. At that point, I became a weekly commuter again, leaving on Monday mornings and returning on Fridays. Initially, I made some midweek trips, but I eventually gave that up as it became more inconvenient and expensive. I mostly traveled on the Mortara line, using the Milan Porta Genova-Mortara-Casale route. From Casale to Milan, there were three main options: via Mortara, via Vercelli, or via Valenza. The advantage of these options was that with a single ticket, I could decide at the last minute which route to take. However, over time, there were reductions in train services and stricter ticket rules, which made commuting more difficult. For example, if I bought a ticket via Vercelli, I couldn't use it to travel via Mortara.

Eventually, I started using "kilometric tickets," which were more flexible. But these were later abolished, and commuting became more rigid. I also noticed a reduction in services, especially during the summer, when trains were replaced by buses on both the Mortara and Vercelli lines. Over time, the Casale-Mortara line was completely replaced by buses, which made it less convenient, so I began using the Valenza or Vercelli routes more often.

Towards the end of my commuting years, I discovered an alternative direct bus between Casale Monferrato and Milan Famagosta. This bus was quite convenient, even though it only ran once in the morning and once in the evening. I used it occasionally, especially on Mondays and Fridays, as it allowed me to relax and even nap during the trip. By 2019, I was already working remotely part-time,

so I only traveled to the office two or three times a week, using either the bus, the Valenza line, or sometimes via Vercelli.

In 2020, due to COVID-19, I fully switched to remote work, and I stopped using trains altogether. Since then, I haven't commuted much, as I retired at the end of 2020. Occasionally, I took the train to meet up with colleagues, but that's about it. And that's pretty much the story of my life as a commuter.

A relevant aspect of the location is the closure of the station during Sundays, highly symbolic moment for the commuting claimed to me from several parts. Nevertheless, Jacopo haven't told me about this aspect in its narrative, then I ask for clarifications about it.

«Once, Sunday was a day, I wouldn't say like any other, but there were still special trains, and the station wasn't closed like it is now. I don't remember this exactly, because I didn't travel systematically, so I couldn't pinpoint the exact date. However, when they started replacing trains with buses, this line, the Alessandria-Chivasso-Turin line, remained active, but no trains run on Sundays, so at that point, there was almost nothing left. As far as I know, on Sundays, there are only four buses to Vercelli and nothing else, and it has been this way for several years now. So, if I need to travel on a Sunday, I'm in extreme difficulty. I can only use one of those four buses, or I have to take the car and go. In fact, I still remember with S., I used to drive her on Sundays, and I drove them to Valenza by car. And those who studied in Pavia were also driven to Valenza by car, because that train, the Alessandria-Valenza-Pavia line, still runs to this day with a certain number of trips, mainly used by arriving students»

Summary of chapter 7

Two other elements worth interest are the analysis of the service transformation from the perspective of "service" , as mentioned in the premises Infrastructural and mobility transformation analysis has a lot of potential if investigated from the perspective of workers and former workers. Indeed, looking at the perspective of the company, it is possible to say that the transformation not regards esclusively the reformulation of services but in general a more deep cultural change of the company and the sector that is embodied by workers retired.

Here it is highlighted how railway work turned from being a "family thing" to a company as many others and the internal relations changed. Moreover, privatization and general precarization of the workforce changed the scenario since railway sector has always been highly unioned sector and this change notions of solidariety and mutualism (Maggi 2017).

 Per gli anziani questa è Mamma Trenitalia, per noi è Trenitalia SPA, punto, fine. (Young conductor)

Another element worth of interest for the continuation of the research regard the analysis of the VECTOR as a perspective for understanding the Infrastructural and mobility transformation. As partially chapter 6 already explained the transformation happened at different speeds and in different ways also within the railway sector and inside the service sphere. Some elements are considered. Looking at the third layer from the persective of the processes that occurred in railway sector such as privatization, regionalization, launch of Hs lead to other reformulation of practices and strategies.

Regionalization led to a grey zone between different regional competences that correspond to intermediate areas: travelling between regions in local lines became hard:

Beside the choice of using fast (and more expensive) connections means bear changes and difficult connections. Regarding the first point is highlighted how HS is attractive that means the attraction to the nearest main metropolitan pole that is served by Hs.

This has consequences both socially (who remained excluded for economical reasons) but also territorial in terms of accessibility of Hs and the reformulation of territorial nodes once crucial "provincial" hubs or the changing role of *intercities.*

Last element regard more explicity the territorial outcome of the infrastructural and mobility transformation, some elemts have been provided in the thesis especially with the data analysis (chapter 5), nevertheless, these aspects claim for more interest also from the qualitative perspective. This conveys the relation between infrastructural and territorial transformation that can be seen in residential practices where Covid 19 marked another transition.

If before covid the strategies in front a housing prices always more expensive in metropolitan cores if compared to provincial areas have lead to broader catchment areas and commuting zones, after Covid 19, it is possible to see the emergence of different strategies that regards the riformulations of multilocalism practices, the implementation of home and smart working, making mobile dynamics and residential choices more complex.

Last aspect considered regards the different strategies in front of the territorial transformation.
Some elements that further research can investigate regard student mobilities and the answer strategies of younger generation that decide to move, before temporary, through commuting, secondly permanently. Second point regards the political aspect – that is possible to see as well from recent elections (both administrative 2022 and national) and regards the sovranist and far right eruption as possible answer to the limitated possibility to be agent and as an answer to a perceived reduced capacity of voice individual and territorial.

Assuming transformation in mobility infrastructure and the reformulation of local lines in intermediate areas as a co - agent of potential processes of territorial marginalization the role of railway infrastructure is still ambiguous and further investigations are needed. Here is underlined the possibility of polarized answers: from one side who consider mobility infrastructure as the way to overcome marginality and agent of territorial agency; on the other side the risks of a more deep peripherization due to better connection towards main cores.

INDEXES OF FIGURES, GRAPHS, MAPS AND TABLES

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APPENDIX

Ente promotore	Livello territoriale	link	Nome banca dati	TAG
ISTAT	NAzionale	https://www.istat.it/it/informazioni-territoriali-e-cartografiche	INFORMAZIONI TERRITORIALI E CARTOGRAFICHE (pagina di sintesi)	territorio ; contenitore
ISTAT	Nazionale	https://amisuradicomune.istat.it/aMisuraDiComune/	A MISURA DI COMUNE	contenitore ; comuni ; territorio
ISTAT	Nazionale	asti.istat.it	ASTI- Atlante statistico infrastrutture italiane	infrastrutture
ISTAT	Nazionale	http://asc.istat.it	Atlante statistico dei comuni	
ISTAT	Nazionale	https://www.istat.it/it/archivio/192693	Allegato statistico - Studenti e bacini universitari	matrice OD ; mobilità studentesca
ISTAT	Nazionale	https://www.istat.it/it/archivio/157423	MATRICI DI CONTIGUITÀ, DISTANZA E PENDOLARISMO	matrice OD ; mobilità studentesca
ISTAT	Nazionale	https://www.istat.it/it/archivio/139381 ;	Matrici pendolarismo censimento 1991	pendolarismo ; mobilità
ISTAT	Nazionale	https://www.istat.it/it/archivio/139381	Matrici pendolarismo censimento 2001	pendolarismo ; mobilità
ISTAT	Nazionale	https://www.istat.it/it/archivio/139381	Matrici pendolarismo censimento 2011	pendolarismo ; mobilità
ISTAT	Nazionale	http://dati.istat.it/Index.aspx?QueryId=20771	Imprese e addetti	imprese ; territorio
ISTAT	Nord ovest	http://dati.istat.it/Index.aspx?QueryId=20771	Imprese e addetti Nord Ovest	imprese ; territorio
ISTAT	Nazionale	https://www.istat.it/it/archivio/199520	TAVOLE - FORME, LIVELLI E DINAMICHE DELL'URBANIZZAZIONE IN ITALIA	fua
ISTAT	Nazionale	https://www.istat.it/it/archivio/16777	INDICATORI TERRITORIALI PER LE	coesione territoriale ;

			POLITICHE DI SVILUPPO	
ISTAT	Naziona le	https://www.istat.it/it/statistiche-politiche-sviluppo	STATISTICHE TERRITORIALI PER LE POLITICHE DI SVILUPPO	politiche di sviluppo
ISTAT	NAZION ALE	https://imprese.istat.it/	STATISTICHE IMPRESE	imprese ; territori o
ISTAT	Naziona le	http://demo.istat.it/bil/index2.php?anno=2018&lingua =ita	DEMO ISTAT	Demogr afia
Agenzia delle entrate	Naziona le	https://www.agenziaentrate.gov.it/portale/web/guest/ schede/fabbricatiterreni/omi/banche-dati/quotazioni- immobiliari	OSSERVATOR IO DEL MERCATO IMMOBILIAR E	immobili ari ; territori o ; casa
ISTAT	Naziona le	https://www.istat.it/comunicato-stampa/laccessibilita- dei-comuni-alle-principali-infrastrutture-di-trasporto/	L'accessibil ità dei comuni alle principali infrastrutture di trasporto	Accessib ilità ; trasporti , infrastru tture
Istat	Naziona le	https://www.istat.it/classificazione/classificazione-dei- comuni-in-base-alla-densita-turistica/	Classificazion e dei Comuni in base alla densità turistica	turismo ; territori o ; covid19
Istat	NAziona le	https://www.istat.it/comunicato-stampa/indice-di- fragilita-comunale-ifc/	Indice sintetico di fragilità	fragilità; territori o ;
EUROSTAT	Europa	https://ec.europa.eu/eurostat/web/cities/data/database	Database Eurostat - Urbanizzazio ne	Europa ; urbanizz azione
EUROSTAT	Europa	https://ec.europa.eu/eurostat/documents/7116161/718898 2/DEGURBA-LAU-2018-Population-Grid-2011.pdf	Degree of urbanisation for local administrativ e units (LAU	Europa ; urbanizz azione
EUROSTAT	Europa	https://ec.europa.eu/eurostat/web/gisco/geodata/reference -data	GEODATI EUROSTAT (SINTESI)	Europa ; gis
Governo Italiano Pres idenza del Consiglio dei Ministri	Naziona le	https://www.urbanindex.it/	Urban Index. Indicatori per le Politiche Urbane	policy ; contenit ore
Agenzia per l'Italia Digitale	Naziona le	https://geodati.gov.it/geoportale/	REPERTORIO NAZIONALE DEI DATI TERRITORIALI	contenit ore
Agenzia per l'Italia Digitale	NAZION ALE	https://www.dati.gov.it/	I dati aperti della pubblica	contenit ore

				amministrazi one (pagina di sintesi)	
Agenzia per la Coesione territoriale	Naziona le	https://www.agenziacoesione.gov.it/lacoesione/dati-statistici-sulla-politica-di-coesione/	Dati statistici sulla politica di coesione	coesione territori ale ;
Agenzia per la Coesione territoriale	Regiona le	https://www.agenziacoesione.gov.it/comunicazione/pubblic azioni/analisi-socio-economica-schede-regionali/	(2016, 2017, 2018) Analisi Socio-economica: Schede regionali	coesione territori ale ;
SNAI	Naziona le		Classificazion e comuni 2014	aree interne
SNAI	Naziona le	https://www.agenziacoesione.gov.it/strategia-nazionale-aree-interne/la-selezione-delle-aree/	Indicatori per la "Diagnosi aperta" delle aree-progetto: indicatori utilizzati durante l'istruttoria	aree interne
MIT / MIMS	Naziona le	http://dati.mit.gov.it/catalog/dataset/grafo-stradale-anas/resource/03b00add-fcde-4818-b5e9-cdc02033fd13	Grafo ANAS in formato ESRI Shapefile	Mit ;
RFI	Naziona le		Mappa stazioni georef	ferrovie ; qgis
Ministero dell'Universi tà e della Ricerca	Naziona le	http://ustat.miur.it/opendata/	Portale dei dati dell'istruzion e superiore	universit à ; scuola ; mobilità student esca
MIUR	Naziona le	https://anagrafe.miur.it/index.php	Anagrafe Nazionale Studenti	universit à ; scuola ; mobilità student esca
IRES PIEMONTE	Regioni	https://www.regiotrend.piemonte.it/2014-06-02-08-38-26/le-altre-regioni	Link banche dati statistiche regionali	contenit ore
IRES PIEMONTE	Regione Piemont e	https://www.regiotrend.piemonte.it/pandora-web	Banca dati Pandora web	piemont e
IRES PIEMONTE	Regione Piemont e	https://www.regiotrend.piemonte.it/cruscotto-ait	CRUSCOTTO AIT	regione piemont e ; ait
IRES PIEMONTE	Regione Piemont e	https://www.demos.piemonte.it/	Osservatorio Demografico Territoriale del Piemonte	Piemont e ; demogr afia

Regione Piemonte	Regione Piemonte	http://www.cittametropolitana.torino.it/cms/sit-cartografico/sportelli-cartografico/sportelli-gitac-servcarto-dett	Cartografia – Regione Piemonte	piemonte ; cartografia ; qgis
Regione Piemonte	Regione Piemonte	http://www.ruparpiemonte.it/infostat/index.jsp	PIemonte STAtistica e B.D.D.E.	piemonte ; data
Città di Torino	Comune di Torino	http://geoportale.comune.torino.it/web/	Geoportale e governo del territorio	piemonte ; cartografia ; qgis
POLIS	Regione Lombardia	https://www.polis.lombardia.it/wps/portal/site/polis		contenitore
Regione Lombardia	Regione Lombardia	http://www.asr-lombardia.it/asrlomb/	Annuario statistico regionale	contenitore
Comune di Milano	Comune di Milano	https://dati.comune.milano.it/organization/comunedimilano	Dataset comune di MILANO (sintesi)	contenitore
AIDA	Nazionale	https://aida.bvdinfo.com/version-2021129/Home.serv?product=AidaNeo	AIDA. Analisi Informatizzata delle Aziende Italiane	Companies ; aziende
Area politiche attive del lavoro Unioncamere	Nazionale	https://excelsior.unioncamere.net/	Sistema informativo per l'occupazione e la formazione	lavoro ;
OPEN STREET MAP	internazionale	https://wiki.openstreetmap.org/wiki/Map_features#Stations_and_Stops	LEGENDA OSM	OSM ; gis
SCIAMLAB	internazionale	https://sciamlab.com/opendatahub/dataset	SCIAMLAB	contenitore
SCIAMLAB	internazionale	https://sciamlab.com/opendatahub/group/tran	SCIAMLAB /TRANSPORT	contenitore
Climate-data.org	internazionale	https://en.climate-data.org/	BANCA DATI CLIMA	clima
Associazione Italiana Greenways Onlus	Nazionale	https://www.ferrovieabbandonate.it/	Ferrovie abbandonate	ferrovie ; storia
ISPRA	Nazionale	https://annuario.isprambiente.it/sys_ind/726	CAPACITÀ DELLE RETI INFRASTRUTTURALI DI TRASPORTO	strade ; infrastrutture
ISPRA	Nazionale	https://annuario.isprambiente.it/content/annuario-dei-dati-ambientali-2021	Annuario dei dati ambientali 2021	Ambiente ;

ISPRA	Naziona le	https://www.isprambiente.gov.it/it/attivita/suolo-e-territorio/suolo/il-consumo-di-suolo/i-dati-sul-consumo-di-suolo	Il consumo di suolo	Ambient e ; territori o
Camera di Commercio	Naziona le	https://www.tagliacarne.it/	Centro Studi delle Camere di commercio Guglielmo Tagliacarne	Economi a ; camere di commer cio
Fondazione Slala	Locale	https://www.slala.it/	Il sistema logistico del Nord Ovest d'Italia	Alessand ria ; logistica ; nord ovest
AGCOM	Naziona le	https://maps.agcom.it/	Qualità della connessione internet	digitale ; banda larga ; territori o
Regione Lombardia	Regione Lombar dia	https://www.regione.lombardia.it/wps/portal/istituzio nale/HP/DettaglioServizio/servizi-e-informazioni/Imprese/Imprese-di-trasporto-e-logistica/ser-matrice-od-infr/matrice-od	Matrice OD Lombardia	pendola rismo ; mobilità
Agenzia per la mobilità piemontese	Regione Piemont e	https://mtm.torino.it/it/dati-statistiche/indagini/	Matrice OD Piemonte - IMQ 2022	pendola rismo ; mobilità