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Intermediate Cities and Transport Systems in Embedding Global Agendas: A Multi-Level Approach to SDG Implementation

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Abstract

The implementation of the Sustainable Development Goals (SDGs) has revealed a persistent gap between globally defined targets and their effective translation into territorially embedded development processes.

This paper reframes the SDGs as an evolving architecture of multi-level socio-economic planning, the success of which depends on the capacity of sub-national governance systems to operationalise global goals within local economic structures. Within this framework, transport systems and mobility infrastructures emerge as critical enabling dimensions, shaping the spatial organisation of economic activity and simultaneously structuring the accessibility conditions underpinning social inclusion and service provision.

Focusing on intermediate cities, the study argues that these centres consitute strategic meso-level arenas in which policy translation, institutional coordination, and place-based development processes converge. Transport networks—both physical infrastructures (road, rail, intermodal) and organisational arrangements (mobility services, logistics, regulatory frameworks)—play a pivotal role in structuring these dynamics. They

function not only as spatial connectors, but also as integrative platforms linking regional production systems with global value chains, while simultaneously sustaining local accessibility.By adopting a conceptual/policy review, the analysis positions intermediate cities at European and Italian level, as key operational nodes for the delivery of global development agendas through context-sensitive planning. It concludes that the effectiveness of SDG implementation depends less on goal-setting than on the capacity to embed global agendas within territorially specific systems—an embedding process in which transport and mobility act as both catalysts and structuring elements of sustainable and inclusive development.

Keywords: Sustainable Development Goals; Multi-level governance; Intermediate cities; Place-based development; Socio-economic planning; Territorial policy implementation

Introduction

Global warming has accelerated significantly in recent decades, posing major challenges to sustainable development. Greenhouse gas emissions constitute a primary driver of climate change, intensifying the greenhouse effect (Antunes et al., 2023) and posing a significant threat to cities worldwide. Due to their concentration of population, infrastructure, and economic activities, cities both contribute significantly to climate change and are highly exposed to its impacts (Ye et al., 2021). Urban systems are responsible for approximately 70% of global CO_2 emissions (Luqman et al., 2023), and if global warming reaches 1.5°C, the health and well-being of more than 300 million urban residents could be significantly compromised by 2050 (Masson-Delmotte, 2018).Although urban areas occupy only approximately 2% of the Earth's surface, they are responsible for consuming nearly 75% of global natural resources (Madlener & Sunak, 2011). As urbanisation accelerates, particularly in rapidly developing regions, projections by the International Energy Agency indicate that cities will account for 73% of global energy demand and 76% of CO_2 emissions by 2030, while generating around 50% of global waste (UNEP, 2017). These trends highlight the crucial role of cities in climate mitigation and the need for integrated sustainability strategies balancing environmental, economic, and social goals (Ameen et al., 2015). Growing scholarly and policy attention has focused on intermediate cities as strategic actors in the localisation of the Sustainable Development Goals (SDGs). Positioned between metropolitan centres and rural territories, these cities mediate economic, infrastructural, and social flows across regions. In contrast to large metropolitan areas, intermediate cities operate as crucial mediating

nodes between regional economies, infrastructure networks, and community-level services. In this capacity.

Transport systems, in particular, play a pivotal dual role.On the one hand, they enhance economic competitiveness by facilitating flows of goods, labour, and knowledge; on the other, they contribute directly to the achievement of key SDGs—especially sustainable cities and communities (SDG 11), climate action (SDG 13), and reduced inequalities (SDG 10)—through the provision of accessible, low-carbon, and inclusive mobility solutions. Building on debates on multi-level governance and place-based development, this article proposes a conceptual framework linking institutional capacity, territorial integration, and effective implementation. Particular attention is given to mobility infrastructures as enabling tools for SDG localisation. From this perspective, transport governance is conceptualised as a critical cross-scale interface requiring alignment between national strategies, regional planning frameworks, and local mobility policies. Consequently, SDG achievement depends on the design of integrated mobility systems adapted to local territorial conditions. The relevance of intermediate cities within this framework is further clarified by existing institutional definitions. According to UN-Habitat (2015; 2020), an intermediate city is defined as an urban settlement that mediates the flows of people, goods, and services between rural areas and metropolitan centres. ESPON (2014; 2020) conceptualises intermediate cities as nodes embedded within broader Functional Urban Areas, organising territorial connectivity and service provision beyond administrative boundaries. Similarly, the OECD (2021) frames these area as key actors in promoting regional balance and cohesion through the diffusion of development across non-metropolitan territories. The article therefore examines mobility systems in intermediate cities as tools for implementing locally oriented sustainability policies. To substantiate this argument, the paper presents a set of exemplary European and Italian cases, focusing on the use of planning instruments and, specifically, the development of Sustainable Urban Mobility Plans (SUMPs).

These cases illustrate how intermediate cities can implement global objectives through integrated transport planning, thereby strengthening their role within multi-level governance frameworks. However, this analysis is situated within a broader context characterised by a slowdown in global progress towards the SDGs.Despite the momentum created by the 2030 Agenda, progress toward the SDGs has slowed, especially after the disruptions caused by the COVID-19 pandemic and ongoing global conflicts.

The pandemic not only reversed progress in key areas such as poverty reduction, health, and education, but also exposed structural weaknesses in governance systems, contributing to what has been described as a post-COVID stagnation in SDG advancement (United Nations, 2020;

Yuan et al., 2023). At the same time, a persistent implementation gap remains between global SDG commitments and their effective translation into local policies and actions.

This gap is especially evident in cities, where local governments often face financial, institutional, and coordination constraints that limit effective SDG implementation (Valencia et al., 2019; Sharifi, 2022). These structural limitations reveal the extent to which sustainability transitions depend on institutional coordination mechanisms capable of integrating policy objectives across administrative and territorial scales. Within this context, intermediate cities—and their transport systems—emerge as critical arenas for experimentation and implementation. By examining the relationship between intermediate cities, mobility governance, and SDG localisation, this article contributes to current debates on the territorial implementation of global sustainability agendas.

The remainder of the paper is organized as follows. Section 1 presents the Theoretical framework. Section 2 discusses interpretation and policy implications. Section 3 concludes and outlines future perspectives.

Theoretical framework

The transition to low-carbon energy systems requires addressing interconnected social, economic, technological, and institutional challenges (Saraji et al., 2023). In this context, several studies highlight the importance of adopting quality-oriented improvement strategies as a means of advancing sustainability objectives (D'Alessandro et al., 2024).

The United Nations (UN) General Assembly established the 2030 Agenda for Sustainable Development as a global framework that integrates climate and development priorities through the Sustainable Development Goals (SDGs) (Georgeson & Maslin, 2018; D'Amato et al., 2024).

The Agenda includes 17 SDGs and 169 targets supported by monitoring and implementation mechanisms designed to guide global development towards more sustainable pathways. (Halkos & Gkampoura, 2021). Collectively, the SDGs aim to promote more sustainable development by addressing poverty, inequality, and climate change while improving access to education, healthcare, and responsible consumption practices. (Slimani et al., 2024), expanding access to education and healthcare, and supporting the emergence of more equitable and inclusive societies (Saxena et al., 2021). These SDGs are essential for achieving environmental equilibrium, social cohesion, and economic development at the global scale (Arora & Mishra 2019), impacting numerous nations worldwide. Although current patterns of economic, social, and cultural development have contributed to rising emissions and environmental degradation, businesses, institutions and governments should urgently

address these externalities in a more direct and incisive manner. SDGs are frequently employed as a coordinating framework for key dimensions of urban development (Kutty et al., 2020). Given heterogeneity of territorial contexts, each region, along with its provinces and cities, develops its own tailored sustainable agenda for implementation and ongoing monitoring (Alvarez-Risco et al., 2020; D'Amico et al., 2021).Urban areas play a decisive role in achieving these objectives through multiple, interrelated dimensions. Cities account for more than 70% of global CO_2 emissions and generate over 80% of global GDP, positioning them simultaneously as major contributors to climate change and as key agents of mitigation and transformation (Ye et al., 2021). Within this context, urban mobility and logistics systems emerge as critical operational domains, as they directly influence energy consumption, emissions, accessibility, spatial organisation, and economic productivity.

Sustainable urban planning, investment in public transport, and the deployment of renewable energy systems therefore represent key mitigation pathways, while mobility systems connect environmental, economic, and social sustainability objectives. Among the 17 SDGs, SDG 11 ("Sustainable Cities and Communities") is particularly relevant (D'Adamo et al., 2022), as it promotes inclusive, safe, resilient, and sustainable urban environments (Allam & Jones, 2021). A key dimension of this goal relates to reducing the environmental impacts of cities through the improvement of air quality and the development of sustainable transport systems (Pérez et al., 2024). SDG 11 emphasises sustainable mobility and improved air quality, while transport policies also contribute to health, economic productivity, infrastructure resilience, and climate action, contributing to SDG 3 (health, through reduced pollution and increased safety), SDG 8 (economic productivity and efficient logistics), SDG 9 (resilient infrastructure and innovation), and SDG 13 (climate action).

In this context, Sustainable Urban Mobility Plans (SUMPs) represent an important governance tool for coordinating land use, transport infrastructure, and mobility policies in support of SDG objectives. Urban logistics also remain a critical but often overlooked dimension of sustainability planning. Freight transport is responsible for a significant share of urban congestion, emissions, and land-use pressure; therefore, the adoption of sustainable urban logistics solutions—such as low-emission zones, urban consolidation centres, last-mile electrification, and digital freight platforms—becomes essential for achieving climate and efficiency targets (Percoco, 2023).Global initiatives such as ICLEI – Local Governments for Sustainability, the C40 Cities Climate Leadership Group, and UN-Habitat's New Urban Agenda reinforce the role of cities in advancing sustainable urbanisation. However, their effectiveness depends on

localisation processes and the capacity of local authorities to integrate transport and logistics within broader planning frameworks. According to OECD estimates, inadequate coordination with local and regional authorities could leave a substantial share of SDG targets unattainable (OECD, 2020a). This highlights the importance of multi-level governance and place-based policy approaches (Blasi et al., 2022), as well as the role of cities as mission-oriented organisations prioritising collective welfare (Ioppolo et al., 2014). SDG implementation can be understood as a multi-level process through which global objectives are adapted to local contexts. In this process, transport and logistics systems act as key operational interfaces through which abstract sustainability goals are translated into concrete mobility and logistics policies.

To support this operationalisation, the adoption of Key Performance Indicators (KPIs) becomes essential. In the context of Nocera Inferiore, KPI-based monitoring assumes particular relevance due to the fragmented institutional structure characterising the wider metropolitan and peri-urban system. Indicators related to modal share, public transport accessibility, intermodality, traffic emissions, walkability, and proximity to essential services may provide measurable benchmarks for evaluating the territorial effectiveness of SDG implementation. Furthermore, the integration of KPI frameworks within mobility planning instruments enables local administrations to strengthen evidence-based policymaking processes, improve transparency, and facilitate access to European funding mechanisms increasingly linked to sustainability performance and climate transition objectives. KPIs help cities evaluate policy outcomes through monitoring and benchmarking activities (OECD, 2020a; United Nations, 2022). Within intermediate cities context, where resource constraints require targeted interventions, KPIs are particularly valuable for prioritising investments and evaluating policy effectiveness.In the context of sustainable mobility and logistics planning, KPIs can be structured along four main dimensions. From an environmental perspective (SDGs 11 and 13), indicators such as per capita transport-related CO_2 emissions, modal share of sustainable transport, air pollutant concentrations (NO_2, PM10), and the diffusion of zero-emission vehicles capture the effectiveness of decarbonisation strategies. From an accessibility and social inclusion perspective (SDGs 3, 10, 11), indicators including access to public transport, travel time to essential services, affordability of mobility, and road safety provide insights into equity and quality of life.

From an economic and logistics efficiency perspective (SDGs 8 and 9), KPIs become particularly relevant for freight systems, including delivery reliability, vehicle kilometres travelled (VKT), load factors, last-mile emissions, and the adoption of low-emission logistics solutions. These

indicators are crucial in intermediate cities, where proximity-based logistics and smaller urban scales can enable more efficient distribution systems (MATEC Web of Conferences, 2024). Finally, from a governance perspective (SDG 17), indicators such as stakeholder participation, the degree of integration between transport and land-use planning, data availability, and implementation rates of SUMP measures reflect institutional capacity and coordination effectiveness.Within the multi-scalar architecture of SDG implementation, intermediate cities emerge as a strategic but underexplored level of action. Defined as urban centres with populations ranging between 20,000 and 500,000 inhabitants (Bolay & Kern, 2019), they function as meso-level governance nodes linking regional systems with local service provision. Their compact urban form and lower congestion levels facilitate the implementation of integrated mobility and logistics solutions.

Notwithstanding persistent structural constraints (Revi et al., 2014), intermediate cities offer significant opportunities for policy experimentation and innovation, particularly in the domain of sustainable transport. Their scale allows for faster implementation cycles, closer interaction between stakeholders, and more adaptive governance structures. As noted by Bell and Jayne (2009), these cities represent ‘alternative spaces of globalisation’, in which development processes can be more inclusive and territorially embedded. Empirical evidence confirms that intermediate cities can function as living laboratories for integrated mobility and logistics planning. European cases such as Freiburg, La Rochelle, and Vitoria-Gasteiz demonstrate how coordinated investments in public transport, cycling infrastructure, demand management, and sustainable urban logistics can significantly improve environmental performance and urban liveability. These experiences highlight the importance of integrating passenger and freight transport within coherent and unified planning framework.

In Italy, intermediate cities play a crucial role due to administrative fragmentation and the need for inter-municipal coordination. They operate as key hubs for education, healthcare, and economic activities, while also providing a suitable scale for implementing integrated planning instruments such as SUMPs and urban logistics strategies. National and European programmes (URBACT, CIVITAS, Urban Innovative Actions) have further demonstrated their capacity to lead sustainable transitions.

Empirical evidence from Southern Italy—including Brindisi (port-city logistics integration), Salerno (low-emission freight systems), Potenza (urban accessibility through vertical mobility), and Cosenza–Rende (active mobility and light rail integration)—illustrate how adapted to local contexts mobility and logistics strategies can address territorial constraints while contributing to SDG targets (Percoco, 2023; Telesca, 2020; MATEC Web of Conferences, 2024). These cases demonstrate an increasing capacity among

intermediate cities to adopt integrated approaches that combine environmental sustainability, economic efficiency, and social inclusion.Within this framework, Nocera Inferiore represents a relevant case of an intermediate city in transition. Its Sustainable Urban Mobility Plan reflects an effort to align local transport policies with SDG objectives, particularly in terms of emission reduction, accessibility, and territorial cohesion. The city's role within a densely urbanised and administratively fragmented context highlights the importance of integrating mobility and logistics planning at the inter-municipal scale, while also strengthening participatory governance mechanisms.Finally, despite global commitments such as the Paris Agreement, progress towards SDG achievement remains insufficient (OECD, 2020a; United Nations, 2022; Sachs et al., 2023). Within this context, the strengthening KPI-based mobility planning in intermediate cities is therefore a strategic priority, as it provides concrete mechanisms for translating global sustainability goals into locally measurable and implementable actions. Achieving these goals will require stronger institutional capacity, better data, and more targeted financial support.

The Paris Agreement and proliferation of city and youth networks demonstrate that the concerns of cities and local governments continue to grow. However, in many instances, the adoption of climate change policies is voluntary and lacks binding obligations (Campos et al., 2017). Table 1 summarises potential governance factors that could guide climate actions in intermediate cities.

Table 1: Factors enabling for climate action in intermediate cities

Good governance	Participatory
	Collaborative
	Adequate local capacity
Local champion	Leadership
	Political coherence
	Productive alliances
Trigger factor	Disaster event
	Long term spatial and urban planning traditions
	Externally driven climate interventions
Local capacities and resources	Human resources
	Financial resources
	Technical know-how
	Data and information
Decentralisation	Delegating power and resources to local authorities
	Local authorities are the best to respond to the local needs
	The process needs to be carefully managed
National governments	Policy Coherence (horizontally and vertically)
	Supporting and scaling local climate actions
	Establishing and enabling governance framework

International organizations	Facilitate pilot policy experimentations
	Provide platform for peer learning
	Can help local climate actions

Source: Intermediary Cities and Climate Change: An Opportunity for Sustainable Development (OECD/UN-Habitat, 2022)

As mentioned above, statistical tools for measuring SDGs are essential for enabling consistent data comparison and supporting evidence-based decision-making aimed at their effective implementation.The guide project 'REGIONS2030: Monitoring the SDGs in the EU regions - closing the data gaps' (Lella & Osés Eraso, 2023), launched in 2022 by the European Commission's Joint Research Center (JRC), in which 10 European regions participated, is a recent and up-to-date reference for the construction of the monitoring indicator set. The ten regions to be explored are North Aegean (Greece), Western Macedonia (Greece), Navarra (Spain), Andalucía (Spain), Piemonte (Italy), Puglia (Italy), Pomorskie (Poland), Centro (Portugal), Nord-Vest (Romania), and Manisa, Afyonkarahisar, Kütahya, Uşak.

The 17 Goals were unanimously adopted by all United Nations Member States in 2015 to achieve them within a 15-year horizon (2030) to eridicate poverty, safeguard the planet, and bolster the livelihoods and opportunities of citizens worldwide. The pilot project took the form of defining a common set of indicators for monitoring SDGs at the regional (European) level and within the countries participating in the project. A detailed analysis of all these indicators (definitions, scope, availability, harmonization), as well as their data sources (supranational, national, and/or local) and type (official or experimental), led to the selection of 116 common indicators. Furthermore, properly mainstream SDGs, the EU needs to break silo-thinking and promote policy coherence. This means that all EU institutions should work together and coordinate their policies to ensure that they are aligned with the SDGs. This require breaking down barriers between policy areas and promoting a holistic approach to decision making. By doing so, the EU can ensure that its policies are consistent with sustainable development goals.

The combined use of operational planning instruments—such as the Sustainable Urban Mobility Plan (PUMS), the Regional Mobility Master Plan 2021–2030, and Provincial Territorial Coordination Plans (PTCP)—together with national and regional sustainable development strategies, provides a structurally coherent yet operationally heterogeneous framework for addressing the challenges of intermediate cities like Nocera Inferiore (Italy). In the case of Nocera Inferiore, the alignment between SDG-oriented planning and mobility governance becomes particularly evident through the interaction between local, regional, and national policy instruments. The Sustainable Urban Mobility Plan (PUMS) operates not merely as a technical

transport document, but as a territorial governance mechanism capable of translating global sustainability targets into operational urban policies. More specifically, the local mobility framework contributes directly to SDG 11 through the promotion of accessible and integrated transport systems, to SDG 13 through emission reduction strategies and modal shift policies, and to SDG 9 by strengthening infrastructural resilience and digital innovation in mobility services. At the same time, the integration between mobility planning and territorial cohesion policies reflects the principles of SDG 10, particularly in terms of reducing spatial inequalities between central and peripheral urban areas.

The PUMS of Nocera Inferiore represents the most locally grounded instrument, characterised by an integrated and place-based approach that combines active mobility, public transport, and digitalisation strategies. Its alignment with EU frameworks (e.g. Urban Mobility Package) and national guidelines enhances its potential to attract funding and implement sustainable interventions. However, its effectiveness is constrained by fragmented implementation processes, limited inter-municipal governance, and weak monitoring systems—factors that directly undermine progress towards measurable SDG targets.

At the regional level, the Mobility Master Plan 2021–2030 introduces a comprehensive and dynamic vision, integrating environmental assessment, multimodality, electrification of transport systems, and Intelligent Transport Systems (ITS). These elements contribute significantly to SDG 13 (Climate Action) and SDG 7 (Affordable and Clean Energy). Nonetheless, application complexity, financial uncertainty, and insufficient operational integration with local SUMP may limit its overall effectiveness,, particularly in polycentric territorial contexts such as the Agro nocerino-sarnese. Provincial Territorial Coordination Plans and area-based plans provide a necessary supra-municipal perspective, enabling the identification of infrastructural corridors, intermodal nodes, and functional linkages between Nocera Inferiore and neighbouring urban systems such as Naples and Salerno. This territorial dimension is essential for advancing accessibility and spatial equity, key components of SDG 11. However, the effectiveness of these instruments is constrained by their outdated nature, weak binding capacity, and lack of operational detail, which hinder their ability to guide short-term priorities and investment decisions.Italian national and regional sustainable development strategies further strengthen this framework by introducing cross-cutting ’vectors of sustainability‘, including participation, multi-level governance, innovation, and capacity building. These vectors are particularly relevant for intermediate cities, where governance fragmentation and limited administrative capacity frequently represent structural constraints. In this context, participatory approaches—especially involving younger

generations—can enhance policy legitimacy, promote behavioural change towards sustainable mobility (e.g. active travel, shared mobility), and and support more inclusive urban regeneration processes.

Despite these strengths, the overall framework remains characterised by a high degree of abstraction, extended execution timelines, and challenges in monitoring and evaluation at the local scale. The absence of standardised and operational indicators further constrains the capacity to assess progress towards SDGs in a consistent and measurable way.In synthesis, although the integration of planning tools and sustainability strategies provides a robust strategic foundation, their effectiveness in intermediate cities such as Nocera Inferiore ultimately depends on three critical factors:

- strengthening multi-level governance and inter-municipal coordination,
- improving administrative and financial implementation capacity,
- developing of coherent monitoring systems aligned with SDG indicators.

Addressing these gaps would enable intermediate cities to act not merely as recipients of policies, but as active laboratories for sustainable, inclusive, and low-carbon mobility transitions.

In addition, the EU should establish a dedicated financial instrument to support and finance sustainable projects. Such a mechanism would provide the necessary resources for the implementation of the SDGs and promoting sustainable development. The EU can also use this mechanism to incentivise and support Member States in their endeavours to achieve SDGs. By instituting a specific funding mechanism for sustainable projects, the EU would reinforce its commitment to the SDGs and provide the necessary resources for their application.

Finally, the European Commission should play a leading role in promoting sustainable public expenditure and in supporting projects designed to address sustainability challenges. This can be achieved through a range of mechanisms, including the provision of guidance and technical assistance to Member States, promoting sustainable investment opportunities and incorporating sustainability criteria into funding decisions.In this way, the EU would incentivise Member States to prioritise sustainability-oriented initiatives and thereby strengthen their contribution to the achievement of the SDGs.

Results and Discussion

The development framework of regional sustainable development strategies has a very different international and global context. The strategies are essential for driving inclusive economic growth and improving residents'

quality of life. These approaches prioritize coordinated efforts and collaboration among diverse stakeholders to set long-term objectives and implement effective policy interventions. From the experiences of involving different countries and stakeholders at the international level, the main results are as follows.The OECD report 'A Territorial Approach to the Sustainable Development Goals' (2020a) indicates that successful involvement and collaboration with local and regional governments are essential for the achievement of at least 105 out of the 169 SDGs targets (Yigitcanlar & Dizdaroglu, 2015); hence, the important work on observing the territorial dimension of the fulfilment of the SDGs through the achievement of regional sustainable development strategies, represents an implementation tool for bottom-up, participatory, holistic, and multi-sectoral territorial development change. To enhance the clarity and accessibility of the research findings, we report the results in concise diagrams.

Among the findings related to territorial engagement, it emerges that the capability of the SDGs to redesign sustainable development policies must consider (as shown in Table 2 below): place-based priorities, budgeting decisions, and private sector engagement.

Table 2: The potential of SDGs for reshaping sustainable development policies

Place-based priorities	Identification	SDGs provide a framework for identifying place-based priorities for sustainable development
	Re-orientation	SDGs can help re-orient existing strategies and plans
	Synergies among sectoral policies	SDGs can promote synergies among sectoral policies to achieve consistent social, economic, and environmental outcomes
	Civil society and citizen engagement	SDGs can boost engagement with civil society and citizens, particularly youth, in co-designing visions and strategies with local stakeholders
Budgeting decisions	Resource allocation	SDGs can drive better budgeting decisions by allocating resources based on prioritized goals and targets
	Vertical coordination	SDGs can foster vertical coordination between national and subnational governments to align priorities and resources
Private sector engagement	Incentivizing sustainable business models	SDGs can incentivize public-private partnership to drive more sustainable business models for people, places and firms

Source: authors' elaboration

Among the main findings, the research shows that recently the main disparities in specific SDGs between cities and regions in the OECD are related to quality and gender equality. In terms of performance, it is noteworthy that the OECD has developed a set of indicators to track the

progress of regions and cities in achieving the SDGs. The average SDG Index score of EU countries in 2023 is 72 percent, with northern European countries (Finland and Denmark) playing a leading role. Evidence from 2022 indicates that in terms of distance to suggested end values for 2030 between OECD regions and cities shows that the majority of regions in OECD countries have not yet achieved the suggested end values for any of the 17 SDGs. This persistent gap, compounded by multiple overlapping crises since 2019, has contributed to stagnation and, in some cases, a reversal of progress on "Leave No One Behind" indicators, particularly with regard to the measurement of within-country inequalities.

Weaknesses in progress at the European level persists with environmental and biodiversity objectives, including sustainable food and land systems, including sustainable food and land systems (SDG 2, SDGs 12–15). The SDGs Index score for Italy in 2023 is 69.9 (Finland 80.6 in first place and Turkey 57.1 in last place of OECD countries), placing 21st out of 34.The findings indicate that effective sustainable development policies must be grounded in local priorities, supported by strategic budget allocation and supported through active engagement with the private sector.

A central insight emerging from this research is the marked differences in performance and disparities between cities and regions in the OECD.

The significant disparities in SDG progress between regions and cities within the OECD underscore the need for tailored approaches that address local challenges and leverage unique strengths to ensure equitable and sustainable development. (Table 3).

Table 3: SDGs for local and regional development

Defining and shaping development visions	Using SDGs as a Framework	Cities and regions can use the SDGs to guide their development visions and strategies
	Addressing local challenges	The SDGs can help cities and regions tackle specific challenges such as clean transportation and affordable housing
	Engaging in voluntary National Reviews	Regions and cities should participate in Voluntary National Reviews to reflect progress and address regional disparities
Aligning policy priorities and incentives	Multi-level governance	The SDGs can promote better coordination between national, regional and local governments
	Managing trade-off and synergies	The SDGs can help governments balance competing priorities and find ways to work together for greater impact
	Using budgeting processes	Governments can use SDGs to guide budget allocations and determine policy continuity
Leveraging data and indicators	Guiding policies and actions	SDGs data and indicators can inform decision making and help cities and regions improve people's lives

	Combining data at different scales	Cities and regions can use data from different sources to obtain more comprehensive understanding of progress toward SDGs
	Enhance accountability and transparency	SDGs can promote stakeholder engagement and transparency in policymaking processes
Engaging local stakeholders	Using various tools	Cities and regions can use various of methods, such as awareness campaign and fiscal incentives to engage stakeholders in SDGs initiatives
	De-risking investments	Governments can reduce the risk that private campaigns will invest in SDGs solutions through grants and loans
	Promoting innovations	SDGs encourage the development of innovative sustainable solutions in cities and regions

Source: elaboration by the authors

Sectoral studies also provide operational guidance regarding the implementation of SDGs at the local and regional levels, as summarised in Table 3. Successful SDG application requires a comprehensive approach that involves defining clear development visions, aligning priorities and incentives, leveraging data and indicators, and fostering active engagement with local stakeholders.

Table 4: Roles of different actors in achieving the 2030 Agenda

Business and private sector	Need for innovative financing sources	Insufficient public investment
		The private sector and investors can provide innovative financing sources to bridge this gap
		Including the private sector perspective early in the development process can align priorities and create shared value and impact
Civil society, citizens and youth	Role of civil society organisations	Civil society can drive progress toward SDGs and hold governments accountable for their communities
	The importance of informed citizens	Informed citizens can change their daily habits to support sustainability such as transport, water, waste management and consumption
	Youth Engagement	Youth, including youth councils, are increasingly engaged with the 2030 agenda and its implementation
Universities	Collaboration with governments and communities	Universities can collaborate with governments and communities at the local level
	Generating and disseminating knowledge	Universities can contribute to the SDGs by generating and disseminating knowledge, co-designing policies, and monitoring progress
	Educating and training future leaders	Universities can educate and train students on sustainable development and SDGs to prepare them for becoming future leaders

	Emergence of university networks and initiatives	Networks and initiatives of universities, such as the sustainable development solutions network, are emerging to address the 2030 agenda

Source: elaboration by the authors

Finally, it seemed important not only to define what actions are required but also to identify the main actors involved in addressing the SDGs at the local level (Table 4). In this regard, local authorities play a pivotal role in implementing policies and programs that align with the SDGs, as well as international organizations like the United Nations, the World Bank, and other global institutions providing funds, technical assistance, and policy guidance, supporting local efforts to meet SDG targets. Equally important is the role of the media that plays a crucial role in raising awareness, spotlighting successful initiatives, and ensuring transparency and accountability in the implementation of SDG-related projects.A key enabling factor for effective sustainable mobility planning lies in the clarity of regulatory frameworks and performance indicators within instruments such as PUMS. Clearly defined targets and monitoring systems facilitate the systematic tracking of progress and the recalibration of policies, directly supporting SDG 11 (Sustainable Cities and Communities)—particularly target 11.2 on accessible and sustainable transport systems—and SDG 13 (Climate Action) through improved emissions monitoring and mitigation strategies. This is closely linked to the importance of political and technical continuity. Regularly updated plans, periodic revisions, dedicated administrative structures, and coordinated governance bodies ensure that strategies are consistently implemented over time.

Such institutional stability, as evidenced in cities like Freiburg and Vitoria-Gasteiz, contributes to SDG 16 (Peace, Justice and Strong Institutions) by strengthening governance capacity, transparency, and policy coherence. Equally important is the strategic and targeted allocation of financial resources, particularly those associated with EU programmes. Effective approaches prioritise experimentation, evaluation, and the scaling-up of successful measures, thereby enhancing resource efficiency and innovation. This approach is consistent with SDG 9 (Industry, Innovation and Infrastructure) and SDG 12 (Responsible Consumption and Production), as it promotes more efficient allocation of public investments and supports the transition towards sustainable infrastructure systems.

A shift from isolated, “spot” interventions towards network-based solutions is also critical. Infrastructure such as tram systems, cycling lanes, or superblocks is significantly more effective when conceived as interconnected and visible networks. This systemic approach enhances urban accessibility and liveability, contributing to SDG 11, while also generating

co-benefits in terms of public health and environmental quality (SDG 3 – Good Health and Well-being). Digitalisation plays a crucial enabling role in this transition. The integration of real-time information systems and unified payment platforms reduces user friction, improves accessibility, and increases the attractiveness of sustainable transport modes.

These innovations contribute to SDG 9, by fostering smart infrastructure, and to SDG 10 (Reduced Inequalities), by lowering access barriers to mobility services. In contexts where it is relevant, the integration between port systems, urban environments, and logistics chains—such as in cities like Brindisi or Salerno—can contribute to reducing emissions in sectors that are traditionally difficult to decarbonise. This is particularly relevant for SDG 13, as well as SDG 8 (Decent Work and Economic Growth), by supporting more sustainable economic activities, and SDG 14 (Life Below Water), through the mitigation of port-related environmental impacts.Addressing the complex challenges of sustainability requires the cultivation of critical thinking and decisive action through collaborative and transdisciplinary learning processes (Puertas et al., 2023).

Indeed, need for sustainable practices to safeguard the environment and conserve natural resources has become increasingly evident in contemporary lifestyles (Onorati et al., 2024).

While the 2030 Agenda outlines a pathway towards a more sustainable future, its successful implementation requires the collaborative efforts of businesses, governments, and civil society organizations. The private sector is well-positioned to contribute significantly to achieving SDGs by leveraging its strengths in innovation, adaptability, efficiency, and the provision of specialized skills and resources (Scheyvens et al., 2016).Moreover, a fundamental shift in socioeconomic systems is imperative to secure a sustainable future. As demonstrated by Puertas et al. (2023) environmental education plays a pivotal role in fostering citizen awareness and action. Early-stage education is particularly significant, as it can contribute to the development of generations that are more strongly committed to sustainability principles.

In addition, university campuses are at the forefront of sustainable practices, demonstrating innovative approaches to energy conservation, waste reduction, and green transportation. Education is key to inspiring a population that is both aware of the climate crisis and motivated to act (Puertas et al., 2023).

Furthermore, municipal governments are actively implementing strategies to transition cities toward a more sustainable model. These efforts include reducing carbon emissions, promoting green infrastructure, and enhancing energy efficiency (Pamučar et al., 2023).

By working together with businesses, educational institutions, governments, and citizens, we can create a more sustainable future for all.

Conclusions

This research examines the potential of intermediate cities to contribute to the achievement of the UN Sustainable Development Goals. While recognising the challenges faced by larger cities prone to urban sprawl, intermediate cities -defined as urban centres with populations between 20,000 and 500,000 inhabitants- offer unique opportunities for the experimentation with sustainable development solutions. Their scale fosters a more balanced governance approach, allowing for citizen participation and innovative solutions for urban development and social cohesion. The Italian case study demonstrates the importance of regional strategies and collaboration between national and local governments.

The endorsement scheme and interactive consultation tool represent excellent examples of facilitating this collaboration. Further research is necessary to fully understand the specific role of intermediate cities in achieving the SDGs across various contexts. Nonetheless, the Italian experience underscores the importance of place-based priorities, budgeting decisions, and private sector engagement in this process. In addition, the path to a sustainable future lies in collaboration among businesses, educational institutions, governments, and citizens.

Finally, the adoption of place-based solutions remains essential. Interventions tailored to local morphological and socio-economic conditions—such as vertical mobility systems, science–city corridors, or cycle networks designed as “metropolitan-style” systems—enable context-sensitive responses while maintaining strategic coherence. When embedded within a broader, standardised planning structure, these approaches support adaptive replicability and contribute holistically to SDG 11, SDG 9, and SDG 13, reinforcing the role of intermediate cities as laboratories for sustainable and inclusive mobility transitions.

The research provides concise guidelines for participatory governance, harmonisation of financial instruments, different actors to be involved and redefinition of local policies aimed at achieving the SDGs targets. In the context of contemporary global crises, there is an increasing imperative for local and intermediate city-level policies to foster participatory processes that promote sustainable living for all, particularly given the current stagnation—and in some cases regression—of progress towards sustainability objectives.

Future research could focus on the study of the harmonisation of indicators for monitoring sustainability targets, since such harmonisation is not yet implemented today. Furthermore, the findings indicate that urban

centres (cities and metropolitan areas) benefit from several notable advantages, such as a modern network of roads, public transportation, and utilities that facilitate the efficient movement of people and goods. From an environmental standpoint, robust regulatory frameworks contribute to improved air quality, promote effective waste management, and safeguard green spaces.

Nevertheless, urban centres also exhibit high densities of built structures and frequently experience severe traffic congestion. The combination of dense populations and industrial activities contributes to elevated levelsof air and noise pollution. Conversely, regional areas (rural and less densely populated regions) typically present a low level of infrastructure and limited funding for environmental projects. Without the benefit of strict environmental regulations, regional areas may suffer from lower air quality, influenced by agricultural practices and less rigorous industrial oversight. Addressing these spatial disparities requires targeted and context-sensitive policy strategies. The experience of Nocera Inferiore confirms that intermediate cities can play a strategic role in embedding global sustainability agendas within territorially specific development trajectories. In this regard, transport and mobility planning should not be interpreted exclusively as sectoral policy domains, but rather as cross-cutting governance instruments capable of connecting environmental sustainability, economic competitiveness, and social inclusion.

The alignment between SDGs and mobility planning instruments demonstrates that local transport policies can contribute simultaneously to climate mitigation, accessibility enhancement, territorial cohesion, and institutional innovation. Nevertheless, the effectiveness of this alignment ultimately depends on the capacity of local authorities to integrate planning tools, monitoring systems, stakeholder participation, and multi-level governance mechanisms within a coherent implementation framework. By leveraging the potential of intermediate cities and strengthening collaboration across all governance levels, it is possible to advance a more sustainable, equitable, and prosperous future for present and future generations.

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