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ECO-SOCIAL INTEGRATION OF MOBILITY
POLICIES IN THE EU: HOW SUSTAINABLE URBAN
MOBILITY PLANS MERGE DIFFERENT POLICY
DIMENSIONS IN TWO ITALIAN CITIES

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Abstract

This study examines the eco-social integration of mobility policies within the European Union, with a specific focus on urban mobility. The European Commission recognizes that transportation is essential for fulfilling the free movement of individuals, services, and goods, and it plays a significant role in the EU's economy. However, as crucial gatekeepers, transportation systems are associated with various social and environmental challenges that policymakers should consider. While the transport sector contributes to significant environmental damages, it also creates social inequalities and challenges such as equal access to services, health issues, noise pollution, and job loss risk. The study highlights the need to balance economic, social, and environmental aspects in mobility policies and emphasizes the importance of integrating these dimensions. Moreover, this research explores the evolution of EU mobility policies and the increasing focus on Sustainable Urban Mobility Plans (SUMP) as a solution for addressing environmental and social concerns in the EU. In particular, SUMP are investigated at the micro level through the analysis of the case studies of Padova and Rome, to assess the influence of the scale on the integration of eco-social dimensions.

Introduction

In its 2009 Communication for a sustainable future for transports¹, the European Commission claimed that transports are the enablers of many of the EU's freedoms. In particular, they allow people to work, access different goods and services, trade and develop personal relationships. Therefore, although the European Union does not formally include it into its Charter of Fundamental Rights, mobility represents an essential freedom for European citizens. Indeed, especially in light of the EU's free movement of persons, services, goods and capital, mobility can be considered a key facilitator in this domain.

However, being means of transport crucial gatekeepers, they can be associated with a number of social aspects that policymakers should take into consideration while elaborating mobility policies. Some of them are related to the concept of social justice, as in the example of equal access to means of transports in terms of disability or reduced mobility, geographical distance, prices or ICT-literacy, in case of digitalised modes of transports. Other societal concerns to be taken into account are connected to environmental issues, such as poor health or diseases due to the exposure to high levels of greenhouse gas (GHG) emissions produced by transports, accidents caused by congestion, inconveniences created by noise pollution or job loss risk related to the greening and digitalisation of the transport sector. As a matter of fact, environmental damages connected to transports and mobility are considerable. Specifically, although between 1990 and 2021 GHG emissions in the EU have reduced by 30%, the transport sector is responsible for 25% of the total emissions². Interestingly, it is the only major economic sector in Europe that has experienced an increase in GHG emissions since 1990. Moreover, GHG emissions from transportation have consistently risen between 2013 and 2019.

¹ Commission of the European Communities, *“Communication from the Commission – A sustainable future for transport: Towards an integrated, technology-led and user friendly system”*, 2009, <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2009:0279:FIN:EN:PDF>.

² “Transport and mobility”, European Environment Agency, last modified May 12, 2023, <https://www.eea.europa.eu/en/topics/in-depth/transport-and-mobility>.

Furthermore, the importance of transports in the EU is determined also by its economic relevance. Indeed, in addition to being a major contributor to the promotion of European integration, the transport sector is a key driver of economy, accounting for over 9% of the EU's gross value added³. Data show that in 2016, transport services contributed approximately with €664 billion to the economy and employed around 11 million individuals. The Commission, indeed, since sustainability was inserted into mobility policies in 1992, had prioritised for a longtime the economic side of this sector, tackling social and environmental challenges respectively as secondary and tertiary aspects. Even if progress has been made towards the creation of more balanced eco-social policies, the EU seems to pursue a green growth approach, promoting the concept of ecological modernisation⁴. This means that growth is always at the centre of its policies, also in case of environmentally-friendly actions. In this context, growth is carried out through innovation and technological progress, while trying to stop the connection between development and ecological impact. This approach is reflected by the EU's most recent mobility policies, that have progressively attributed a key role to innovation, digitalisation, ICT solutions, alternative sources of energy in this field, in order to keep and renew the economic value of transports, while attempting to reduce their negative effects on environment and society.

Given these significant impacts of the transport sector, this study focuses on the analysis of the eco-social integration of mobility policies within the European Union, with a specific attention on urban mobility. Mandelli⁵ proposes to define eco-social policies as public policies which explicitly aim at achieving both environmental and social objectives in an integrated way. Indeed, literature in the field of eco-social policy shows that it is very common that policies aiming to address environmental sustainability can create

³ "Transport", European Union, https://european-union.europa.eu/priorities-and-actions/actions-topic/transport_en#:~:text=Transport%20is%20also%20a%20major,employ%20around%2011%20million%20people.

⁴ Mandelli, M. et al., "The EU's Potential For Promoting an Eco-Social Agenda" Report prepared for the project "Sustainable welfare societies: Assessing linkages between social and environmental policies", *European Social Observatory*, (December 2018).

⁵ Mandelli, Matteo, "Understanding eco-social policies: a proposed definition and typology", *European Review of Labour and Research* 28, no.3 (2022): 333-348, <https://doi.org/10.1177/10242589221125083>.

social and economic challenges, and vice versa⁶. An example in the transport field is the increase of fuel taxes, that created social discontent and protests in Europe, especially in France in 2018. In this context, fuel taxes have the objective of reducing environmental damages, without taking inequalities that can arise within society into account, if they do not make a distinction between different social groups. Moreover, in order to design adequate eco-social policies, it is fundamental to explicitly clarify synergies and conflicts between environmental and social issues⁷.

The first chapter of this study outlines the main issues of the academic debate around what integrating environmental and social aspects of a policy means. Indeed, although both environmental and social policy aim at tackling long-term challenges, risks and inequalities, they present considerable differences. While social security policies benefit from a more substantial governmental budget, are managed by dedicated public agencies and produce more tangible and short-term benefits, environmental policies dispose of a lower budget, are not always managed by specific dedicated administrative departments and their effects are perceivable in the long-run⁸. Their different nature, objectives, subjects involved and budgets allocated are useful points of departure in order to understand why their combination within the same policy domain is challenging. Moreover, policies which are consistent from the ecological point of view can be the source of social inequalities, giving birth to problems of injustice⁹. Therefore, it is fundamental to design direct and radical eco-social policies, identifying synergies and conflicts with the support of citizens and stakeholders¹⁰. In addition, a section of the first chapter is dedicated to the application of eco-social analysis to the field of mobility, where the main environmental issues created by the development of transports and the connected social problems to be tackled when designing a policy are explained. The

⁶ Koch, Max and Martin Fritz. "Building the Eco-social State: Do Welfare Regimes Matter?", *Journal of Social Policy* 43, no. 4 (2014): 679-703. doi:10.1017/S004727941400035X.

⁷ Pye, Steve et al., "Addressing the social dimensions of environmental policy - A study on the linkages between environmental and social sustainability in Europe", (European Commission: 2008).

⁸ Otto, Adeline, and Gugushvili, Dimitri, "Eco-Social Divides in Europe: Public Attitudes towards Welfare and Climate Change Policies", *Sustainability* 12, no. 1 (2020): 404. <https://doi.org/10.3390/su12010404>.

⁹ Garting, Lisa et al., "Sustainable Welfare in Swedish Cities: Challenges of Eco-Social Integration in Urban Sustainability Governance", *Sustainability* 12, no.1 (2020): 383, <https://doi.org/10.3390/su12010383>.

¹⁰ Pye, Steve et al., "Addressing the social dimensions of environmental policy - A study on the linkages between environmental and social sustainability in Europe", (European Commission: 2008).

chapter ends with an in-depth examination of EU's mobility policies in the period between 1992, when the strategy for mobility was connected to the concept of sustainability for the first time, and 2020, when the last Sustainable and Smart Mobility Strategy was proposed in the context of the European Green Deal.

From the analysis of the different mobility policies in the time-frame investigated emerges the increasing understanding of the relevance and potential of urban areas, where the conflicts between social inequalities and environmental pressures are more and more evident¹¹. This is the reason why the second chapter of this study focuses on Sustainable Urban Mobility Plans (SUMP), a solution which was first envisaged in 2013, in the context of the Communication of the Commission entitled "Together towards competitive and resource-efficient urban mobility"¹². In that period, indeed, around 23% of total EU CO₂ emissions was produced by transports in urban areas. In addition, cities require specific attention because, hosting 74% of EU population, they are the places where a considerable part of social challenges and economic activities are concentrated¹³. Therefore, urban areas are the centres of innovation, experimental solutions and technological advancement, opening up the possibility for an enhanced transition towards environmentally-friendly and just mobility policies. In particular, following the analysis of the first chapter, the second chapter explores Eltis' guidelines, Europe's observatory on urban mobility, for the design and the implementation of SUMP and their transposition in the Italian vademecum for the preparation of these plans at a local level. The other key components of eco-social transport policies, in addition to interconnectedness, urban areas and innovation, are local authorities. As a matter of fact, in parallel with the identification of urban mobility as the right approach to be adopted, the 2013 Strategy of the Commission recognised also the need to shift to lower scales in order to ensure the effectiveness of integrated policies. As a consequence,

¹¹ Amato, Chiara, *Il diritto alla mobilità – Riequilibrio territoriale, mobilità sostenibile e inclusione sociale nelle strategie di rigenerazione urbana*, Roma: Aracne Editrice, 2021.

¹² European Commission, "Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions – Together towards competitive and resource-efficient urban mobility", 2013, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A52013DC0913>.

¹³ European Environment Agency, "Urban sustainability in Europe – Avenues for change", 2021, doi:10.2800/36105.

SUMPs have to be adapted to specific circumstances of Member States and to peculiar features of cities. However, the Italian guidelines, despite giving the possibility to local administrations to select the specific instruments to put SUMPs into practice, impose the inclusion of a long list of macro-objectives and suggest a series of strategies that the plans have to conform to, revealing a centralised approach to the application of its indications.

The third chapter focuses on two case studies, that of the *Conferenza Metropolitana di Padova* and of that of the *Città Metropolitana di Roma Capitale*, two agglomerates composed of a main urban centre and bordering municipalities. These two areas are significantly different in terms of population, size, geo-morphological conformation and socio-economic characteristics, but present similarities as far as mobility-related and environmental issues are concerned. The SUMPs of the two urban areas are similar in terms of structure, objectives and strategic orientation, as prescribed by the Italian guidelines, but the high number of instruments proposed by the two plans are presented differently. Indeed, while the smallest context of Padua marginally highlights the linkages between environmental, social and economic effects of its interventions, the SUMP of Rome is characterised by a clear eco-social policy integration effort.

The goal of this research is twofold. First, it aims at understanding whether and how the European Union has integrated the environmental and social dimensions in its mobility policies since the introduction of the sustainable development mainstreaming principle in this field in 1992. In order to address this challenge, the first chapter initially elaborates a qualitative analysis of the main literature in the field, especially in light of John Dryzek's insight about social injustice concerns related to environmental policies¹⁴. After a careful presentation of environmental and social policies' possible points of contact and conflicts pointed out by experts in the field, an analysis of ecological and social issues of mobility is provided, mainly relying on relevant reports and datasets of the European Environment Agency (EEA). Taking account of the outcomes of these

¹⁴ Dryzek, John, "The ecological crisis of the welfare state", in Gough, I., Meadowcroft, J., Dryzek, J., Gerhards, J., Lengfield, H., Markandya, A. and Ortiz, R. (eds.), "JESP symposium: climate change and social policy", *Journal of European Social Policy* 18, no. 4 (2008): 325–344, <https://doi.org/10.1177/0958928708094890>.

investigations, the research continues with an examination of all transport and mobility policies proposed by the European Commission, starting with the 1992 Communication, COM(92) 494, and ending with its 2020 Strategy, COM(2020) 789. Finally, in the second chapter, updated Eltis Guidelines for the elaboration of SUMP are in-depth examined, in order to carry out an analysis at a meso-level, compared to the previous macro-level analysis of the European Commission's proposed policies. Similarly, a qualitative investigation of the Italian Ministry for Infrastructures and Sustainable Mobility's policy documents related to the preparation of SUMP is proposed, with the goal of assessing whether attention on integrated eco-social policies is translated within Italy's SUMP's policy.

In this context, a specification about the terms "mobility" and "transport" is required in order to avoid misinterpretations along the analysis. As the EEA underlines¹⁵, transport meets the demands for mobility arising from various activities such as residential and occupational needs, as well as the exchange, trade, and provision of goods and services. The reason why transport is necessary is that these activities typically occur in different locations. In essence, the term "mobility" refers to the need and opportunity to travel from one place to another, and transport serves as the means by which this requirement is practically fulfilled. However, although these words are used to describe different concepts, in this research paper they will be used interchangeably because of simplification reasons.

The second research objective is to understand whether and how the EU's goal of integrating social and environmental dimensions have been achieved at the local level, through the analysis of the SUMP of two Italian cities. Therefore, this research will trace the connection between macro (EU), meso (Eltis guidelines for the redaction of SUMP) and micro (local SUMP) levels. More specifically, the analysis focuses on the cases of the *Conferenza Metropolitana di Padova* and *Città Metropolitana di Roma Capitale's* SUMP and it draws on EU and local policy documents as well as on thematic reports

¹⁵ "Transport and mobility", European Environment Agency, last modified May 12, 2023, <https://www.eea.europa.eu/en/topics/in-depth/transport-and-mobility>.

and data collected by the Italian SUMP's Observatory¹⁶, that is managed by the association Euromobility and supported by the Italian Ministry for the Environment and Energy Security and *Rete Ferroviaria Italiana*. The purpose of the latter comparison is to understand if there are any similarities in the strategy of the two selected cities regardless the differences in their population size, geographic position and socio-economic challenges, and in light of their affinities in terms of environmental issues related to mobility.

¹⁶ For more information about the Italian SUMP's Observatory visit the official website <https://www.osservatoriopums.it/osservatorio/>

Chapter 1 Eco-social integration in the European mobility policies

1.1 Eco-social policy integration: a theoretical framework

Right from the birth of sustainable development concept, the ecological preservation and social protection have been presented as connected dimensions. According to the “Brundtland Report”¹⁷, sustainable development means ensuring the protection of the present needs without preventing future generations from meeting their own needs. This can be done improving the organisation and use of environmental resources, fixing some limitations. Therefore, human needs and environmental protection are intrinsic elements of the definition of sustainable development. However, the Report’s focus is on economic growth, which has to be managed differently from previous eras, taking the social and environmental needs into account, adopting an intergenerational and global perspective. The social dimension is particularly stressed in the report, highlighting that it is crucial to satisfy the basic human needs of all, although poverty is inevitable.

In this context, also the Degrowth Declaration of the 2008 Paris Conference¹⁸ recognised that degrowth shares sustainable development’s goal to carry out a transition towards a fair, participatory and environmentally sustainable society, aiming at meeting basic human needs and assuring a high quality of life¹⁹. So, also in this occasion, ecological sustainability was associated to social protection objectives.

According to Koch and Fritz²⁰, the transition towards increasingly sustainable production and consumption standards is likely to produce inequalities and conflicts in societies, that should be addressed by social policies. In doing so, State regimes should formulate

¹⁷ World Commission on Environment and Development, *Our Common Future*, 1987, <https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf>.

¹⁸ Research & Degrowth, “Degrowth Declaration of the Paris 2008 conference”, *Journal of Cleaner Production* 18, no. 6 (2010): 523-524, 10.1016/j.jclepro.2010.01.012.

¹⁹ Buch-Hasen, H. et al., “Shifting Priorities in Degrowth Research: An Argument for the Centrality of Human Needs”, *Ecological Economics* 138 (2017): 74-81, <https://doi.org/10.1016/j.jclepro.2010.01.012>.

²⁰ Koch, Max and Martin Fritz. “Building the Eco-social State: Do Welfare Regimes Matter?”, *Journal of Social Policy* 43, no. 4 (2014): 679-703. doi:10.1017/S004727941400035X.

policies which are in synergy with environmental objectives, identifying a way to establish a non-conflictual relationship between these policy dimensions.

Both social and environmental policies aim at addressing long-term challenges, such as capitalist development, industrialisation and urbanisation, modifying them by means of regulation, fiscal transfers and other tools²¹. This alteration of the market is justified by strong moral and pragmatic reasons. For instance, in the case of social interventions, motivations behind interventions can be social justice concerns or economic benefits, while environmental policies are formulated in support of the wellbeing of present and future generations and the ambition to avoid the tragedy of the commons²². Although both types of policies aim at dealing with risks and inequalities, they present substantial differences²³. Firstly, governments used to allocate different amounts of money for these two policy sectors. Indeed, in 2021, general government expenditure on environmental protection of EU countries was equal to 119 billion Euros²⁴, while general government expenditure on social protection of EU countries amounted to 2.983 billion Euros in 2021²⁵. Social policies in developed countries date back to mid-20th century, while environmental policies started to appear in the late 1960s. Social provisions are managed in specific government agencies, while environmental protection policies are usually assigned to agencies with other dominant tasks. Social benefits are provided through cash and in-kind contributions, while environmental interventions usually rely on regulations. Indeed, social benefits are tangible and immediate, while environmental advantages are long-term and more gradual. Moreover, social security policies are mainly a competence of the Member States, while environmental international agreements and EU regulations are the main way to manage environmental protection.

²¹ Zimmermann, Katharina, and Paolo Graziano, "Mapping Different Worlds of Eco-Welfare States", *Sustainability* 12, no. 5: 1819 (2020), <https://doi.org/10.3390/su12051819>.

²² Otto, Adeline, and Gugushvili, Dimitri, "Eco-Social Divides in Europe: Public Attitudes towards Welfare and Climate Change Policies", *Sustainability* 12, no. 1 (2020): 404. <https://doi.org/10.3390/su12010404>.

²³ Otto, Adeline, and Gugushvili, Dimitri, "Eco-Social Divides in Europe: Public Attitudes towards Welfare and Climate Change Policies", *Sustainability* 12, no. 1 (2020): 404. <https://doi.org/10.3390/su12010404>.

²⁴ Eurostat, Government expenditure on environmental protection, (February, 2023), [Government expenditure on environmental protection - Statistics Explained \(europa.eu\)](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Government_expenditure_on_environmental_protection_-_Statistics_Explained_(europa.eu)).

²⁵ Eurostat, Government expenditure on social protection, (February, 2023), https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Government_expenditure_on_social_protection.

Finally, it is thanks to economic growth that welfare policies could be formulated, whereas environmental problems arose because of increasing economic growth. These substantial differences can partly explain why governments and organisations have difficulty in finding trade-offs between these two policy dimensions.

As underlined by many scholars in the field²⁶, very often, those who can be considered the major responsible for some environmental issues do not have to bear the burden of consequences of such problems. The result of this process is the production of a “double injustice”²⁷, with social groups and countries which are less responsible for ecological issues coping with the consequences created by other (wealthier) countries. As Dryzek²⁸ points out, many policies which are consistent from the environmental point of view, influence the poorest negatively. In particular, Gough uses the terms “triple injustice” to refer to the poorest social groups experiencing more than other groups the negative effects of climate change, and those arising from policies which aim at combatting this global threat²⁹. For instance, poor and marginalised groups are affected by both direct and indirect impacts of environmental issues. Direct impacts can be associated to industries, waste plants, infrastructure and energy facilities, while indirect impacts refer to global environmental issues like climate change, deforestation, desertification and others³⁰. In addition, richer countries and social groups are the drivers of environmental pressures because generally they experience a more energy, travel-intensive and material lifestyle.

Environmental policies can not only be in contrast with the social ones, but they can also have a negative impact on social matters. Indeed, the original 1987 “Our Common Future”

²⁶ Gough, Ian, “Climate change, double injustice and social policy: A case study of the United Kingdom”, *UNRISD Occasional Paper: Social Dimensions of Green Economy and Sustainable Development* 1 (2011), ISBN 978-92-9085-083-0.

²⁷ Gough, Ian, “Climate change, double injustice and social policy”.

²⁸ Dryzek, John, “The ecological crisis of the welfare state”, in Gough, I., Meadowcroft, J., Dryzek, J., Gerhards, J., Lengfield, H., Markandya, A. and Ortiz, R. (eds.), “JESP symposium: climate change and social policy”, *Journal of European Social Policy* 18, no. 4 (2008): 325–344, <https://doi.org/10.1177/0958928708094890>.

²⁹ Garting, Lisa et al., “Sustainable Welfare in Swedish Cities: Challenges of Eco-Social Integration in Urban Sustainability Governance”, *Sustainability* 12, no.1 (2020): 383, <https://doi.org/10.3390/su12010383>.

³⁰ Garting, Lisa et al., “Sustainable Welfare in Swedish Cities”.

report on sustainable development developed the intuition that current social standards are not compatible with the pillars of ecology and global and intergenerational justice³¹. Indeed, the importance of identifying a synergy between environmental and social policies is evident in the example of the French Gilet Jaunes 2018 protests. One of the main reasons for their contestations was government's decision to increase fuel taxes in order to facilitate the Country's green transition. This shows how problematic formulating an environmental policy which does not take into account social consequences can be. The substantial difficulty in integrating the ecological and social dimensions in policies is highlighted also by Gough³², who presented the distributive dilemma linked to some mitigation measures, such as the increase of energy prices. Indeed, the rise of domestic gas and electricity prices are likely to foster fuel poverty (i.e. a lower-income individual living in a house which cannot be kept warm at a reasonable price). The United Kingdom, according to the author, experienced a problem of income inequality because of carbon mitigation policies. One of them was the *Climate Change Act* and *The UK Low Carbon Transition Plan*, which showed a conflict between environmental sustainability and social fairness objectives. Moreover, Gough points out that problems of these kinds arise not only in case of formulation of environmentally-friendly policies, but also in the attempt to cope with social impacts of those policies. Indeed, using social policy to compensate those who are harmed by environmental measures does not necessarily result in enhanced equality between social groups. The reason is that the variety of housing and households does not guarantee the disappearance of gainers and losers. Specifically, even employing a use of revenues from carbon taxes that aim at achieving social improvement would not be beneficial to up to a third of low-income households³³. Each alternative presented by the author includes some challenges. Indeed, an expansion of a comprehensive programme of eco-social investment, such as the European Green Deal, can be an effective means to tackle the eco-social issues in an integrated way, producing also some new job opportunities for

³¹ Koch, Max et al., "Sustainable Welfare in the EU: Promoting Synergies between Climate and Social Policies", *Critical Social Policy* 36, no. 4 (2016): 704–15, <https://doi.org/10.1177/0261018316654614>.

³² Gough, Ian, "Climate change, double injustice and social policy".

³³ Gough, Ian, "Climate change, double injustice and social policy".

society. However, while this programming strategy could be beneficial for the society in the long-run, the short-run social issues are often not considered, with the need of an ongoing compensation for the “losers” of this situation. The author suggests to use a low-income price index to identify the regressive effect of increasing domestic energy prices, therefore employing a separate index that can be useful to assess the situation of low income people, retirees and minimum wage workers. In addition, social energy pricing adjusting the energy costs of different socio-economic groups can be a convincing method.

Moreover, Gough³⁴ explains that the EU Emission Trading System (ETS) can be an effective tool to produce more equitable outcomes, but it cannot guarantee that the export of emissions does not occur. Indeed, he calls for more radical policies which contain explicit and direct reference to the integration of the environmental and social dimensions of policies. Personal carbon allowances and trading can be an option, with energy having both a money and a carbon price. Nevertheless, problems of fairness which have to do, for example, with people living in inefficient housing or in areas where the use of car is a must, are not addressed by this type of measure. Besides, the reduction of working hours mentioned by Gough, that would correspond to a reduction in incomes, expenditures, consumption and emissions can be a valid measure. However, the issue of “time inequality” could occur, with the poorest suffering from the harmful effects of a reduced working timetable and salary. Finally, a system where everyone has to show his or her impact on an environmental level could push the richest social classes to commit themselves to improving their performances. However, it is possible to argue that being a non-binding measure, such a system does not have certain results on an eco-social level. These examples are evidences that the eco-social integration is complicated, and that it needs to be addressed in an innovative way, considering each possible social, environmental and economic consequence of a policy.

³⁴ Gough, Ian, “Climate change, double injustice and social policy”.

In addition to the discrepancies and the conflicts that can arise between these two policy dimensions, environmental matters are often overlooked in social policy debates³⁵.

Until recently, the European Union had not explicitly argued the possible conflicts between its ambitious climate goals and its social policies, often including potentially clashing policy goals in the same strategies³⁶. The Joint Research Centre suggested to use the “Sustainable Society Index” to measure States’ level of sustainability in a broad sense, considering human, environmental and economic wellbeing. However, the three dimensions calculated by this tool are not aggregated into one overall index score, leaving the three policy fields separated, lacking an integrated analysis. Therefore, sustainability performances are considered as three main building blocks, as if the EU takes the compatibility between the three dimensions for granted.

A 2008 study³⁷ financed and prepared for the use of the European Commission, underlined that there is the need for formulating and implementing mutually reinforcing policies in both the environmental and social dimensions because they are deeply interlinked. Indeed, according to the analysis, environmental interventions influence society from different points of view, while society have an impact on the environment. In particular, the main issues when coping with this policy interference are the following:

- The distribution of environmental quality: it deals with investigating whether some socio-economic groups suffer from poorer ecological quality rather than others and whether policies focus on such disparities;
- The drivers of environmental quality: it aims at identifying the groups which tend to have the worst effect on environment and whether they pay for their impact;
- The equity of environmental policy: it deals with understanding whether the financial burden of the policies and the ability to pay are equal.

³⁵ Koch, Max et al., “Sustainable Welfare in the EU”.

³⁶ Koch, Max et al., “Sustainable Welfare in the EU”.

³⁷ Pye, Steve et al., “Addressing the social dimensions of environmental policy - A study on the linkages between environmental and social sustainability in Europe”, (European Commission: 2008).

The authors of the study pointed out a series of recommendations to allow the creation of environmental policies which do not harm the social sphere and vice versa:

- The guiding principle of EU and Member States policies should be “environmental justice”, in order to create environmental policies that take social concerns into consideration;
- The impact assessment process should investigate whether environmental inequalities are addressed in the design and implementation of a specific policy, considering the European, national and local levels;
- Good quality data are fundamental in this domain, and further investments are needed to ensure an efficient data space;
- Differences in consumption patterns, depending on different socio-economic groups, should be identified in order to design targeted policies;
- Environmental policies should try to reduce financial impacts, finding an equilibrium between environmental effectiveness and economic efficiency;
- It is crucial to identify eco-social synergies and conflicts at the local level, involving stakeholders participation in policy design and delivery.

The concept of environmental justice in this study is understood as a good environmental quality for every individual and a fair participation in the design and implementation of environmental policies. Moreover, according to the UK Sustainable Development Research Network (SDRN)³⁸, the concept of environmental justice means ensuring equity in the access to environmental quality and to the participation to the decision-making that has an impact on environmental quality. Furthermore, the network underlines how justice in environmental field has to do not only with the interaction between ecological sustainability and social inclusion, but also with the drivers of environmental problems. Indeed, the “polluter pays” principle and the possibility to benefit from greener goods and services are also central questions in the creation of eco-social policies.

³⁸ Lucas, K. et al., “Environmental, Health and Social Justice Review. Report for Department for Environment, Food and Rural Affairs”, (2004), <http://www.sd-research.org.uk/>.

According to a report published in 2018³⁹, the main issue at the EU level is that, at least until the end of the Europe 2020 Strategy, the European eco-social agenda does not have internal coherence. Indeed, the implementation of policies within this framework has shown that ecological and social objectives are disjointed. In addition, it is possible to state that the European Union gets close to a green growth approach, where growth has the supremacy over other dimensions. Therefore, growth, despite being decoupled from carbon emissions and resource use, is the overarching goal of every strategy. However, this approach has the potential to create synergies between economic, ecological and social goals, producing environmental benefits, economic opportunities while preserving social protection. The authors of the study suggest that the EU, in order to provide a convincing strategy that better integrates ecological, social and economic aims, should improve the connections between green growth and just transition policies.

1.2 Eco-social integration in the mobility sector

Transport and mobility policies need to be addressed in an integrated eco-social direction because many of its challenges are interrelated. According to the European Environment Agency, from the ecological point of view, the transport sector is responsible of considerable negative effects on the environment, producing greenhouse gas (GHG) emissions, air and noise pollution and landscape fragmentation⁴⁰.

In particular, the EU transport sector is strongly dependent on fossil fuels and is among the main contributors to GHG emissions in the 27 Member States. In 2019 the exhaust emissions generated by transports were equal to 25.9% of the overall GHG emissions in the EU. Differently from other sectors, GHG emissions of transports have increased by 33% (except for the 2020, characterised by extraordinary conditions due to the COVID-

³⁹ Mandelli, M. et al., "The EU's Potential For Promoting an Eco-Social Agenda" Report prepared for the project "Sustainable welfare societies: Assessing linkages between social and environmental policies", *European Social Observatory*, (December 2018).

⁴⁰ "Transport and Mobility", European Environment Agency, last modified May 12, 2023, <https://www.eea.europa.eu/en/topics/in-depth/transport-and-mobility>.

19 pandemic, when lower emissions were registered compared to 2019, but still 7% higher than 1990 levels). These data do not take into account GHG emissions linked to the production and distribution of electricity and fuels for transports and the impacts other than CO₂ related to the aviation sector, which would further worsen the scenario. Considering the whole sector, in 2019, the 43.9% of GHG emissions derived from car transport. Although forecasts estimate that emissions produced by road transport will decrease in the future, the transport sector will continue to be the major contributor to GHG emissions in Europe⁴¹.

There are several social aspects connected to the aforementioned environmental challenges. A 2021 study by Gavurova, Rigelsky and Ivankova⁴² showed how CO₂ emissions can be considered as a factor damaging health in general and also a driver of Disability-adjusted life years (DALYs)⁴³. Thus, these researchers recognised the significant connection of CO₂ emissions and public health, underlying the urgency to put effective policies into practices, with the aim of improving health and environment. This study also highlights the need to adopt a more comprehensive investigation of the links between GHG emissions and people's health, calling for a multidisciplinary approach to this question. One of the suggestions proposed by this study is the implementation of improved carbon taxes, which, however, could be a challenge in terms of social justice, issue that will be examined later.

Moreover, the EU transport sector is the major contributor to the creation of nitrogen oxides (NO_x) emissions, the most relevant air pollutant⁴⁴. Specifically, road transport produced 37% of NO_x emissions in 2020. Although NO_x emissions decreased by 48% in the period between 2005 and 2020, they continue to be a source of concern not only

⁴¹ European Environment Agency, "Transport and Environment Report 2022 – Digitalisation in the mobility system: challenges and opportunities", 2022, doi:10.2800/47438.

⁴² Gavurova, Beata et al., "Greenhouse Gas Emissions and Health in the Countries of the European Union", *Environmental health and Exposome* 9, (2021), <https://doi.org/10.3389/fpubh.2021.756652>.

⁴³ DALYs correspond to the deprivation of one year of optimal health. The DALYs attributed to a specific disease or health condition are calculated by adding the years of life lost due to premature mortality and the years lived with a disability caused by prevalent cases of the disease or health condition within a population.

⁴⁴ European Environment Agency, "Transport and Environment Report 2022".

from an environmental point of view, but also for public health reasons⁴⁵. Indeed, epidemiological and toxicological studies in recent decades, have shown that air pollution related to transports has significant effects on people's health. Specifically, transport-related air pollution is associated with a higher risk of death, especially because of cardiopulmonary causes. Some of these include respiratory symptoms and diseases, an increased risk of developing allergies, myocardial infarctions, an increased incidence of lung cancer, adverse effects on pregnancy, asthma attacks and bronchial hyperreactivity. Therefore, measures which aim at reducing air pollution can also have a positive effect on life expectancy. People forced to face high levels of exposure to air pollution are the most impacted by this environmental issue. Some of those exposed the most include people living close to busy roads, road users and people who have to spend a longtime on the roads because of job reasons.

Researchers in the field call for an integration of environmental and health aspects in urban planning and policy-making, in order to create more complete policies, that fully take into consideration all possible consequences of crucial issues.

In addition, one of the consequences of landscape fragmentation for transport-related infrastructure construction is biodiversity loss⁴⁶. Biodiversity is fundamental for ecosystem functioning and the supply of goods and services crucial for people's health and well-being⁴⁷. For instance, our food production systems depend on different species of organisms, which rely on different services provided by ecosystems, such as water quantity and quality and clean air.

These are just some examples that show how transport-related environmental issues are linked to society health and well-being. Therefore, designing policies that fully take into consideration ecological issues' consequences on society is fundamental to address the

⁴⁵ Kryzanowski, Michal et al. (eds), *"Health effects of transport-related air pollution"*, World Health Organization Europe, 2005, <https://apps.who.int/iris/bitstream/handle/10665/328088/9789289013734-eng.pdf?sequence=3&isAllowed=y>.

⁴⁶ European Environment Agency, "Landscape fragmentation in Europe", 2011, <https://www.eea.europa.eu/publications/landscape-fragmentation-in-europe>.

⁴⁷ World Health Organization and Secretariat of the Convention on Biological Diversity, *"Connecting Global Priorities: Biodiversity and Human Health"*, 2015, ISBN 978 92 4 150853 7.

different angles of such problems. As different experts underline in the studies illustrated above, different policy sectors should work in synergy in order to create integrated policies which simultaneously address social and environmental issues .

Projections show that despite implementing current planned sustainable mobility policies, domestic transport emissions will go below their 1990 level only in 2029. However, in recent decades, transports' emissions of air pollutants have decreased thanks to policies related to several transport modes, except for shipping and aviation sector. Moreover, the use of energy from renewable sources used in the transport sector increased, as well as the share of electric vehicles in circulation. These data are particularly encouraging because they show that sustainability policies in the mobility sector can be beneficial on the environmental level.

As far as society is concerned, transports link people, culture, cities, countries and continents⁴⁸. Transport is also part of essential public services and matters a lot for the quality of life. Besides, the transport sector is vital for EU's economy, employing 10.4 million people and bringing an added value equal to 510.3 billion Euros in 2019, without taking upstream and downstream activities into account. It represents the most considerable household expenditure after housing. In terms of social challenges, in addition to health, this sector has negative impacts on accidents, congestion, noise pollution. Also, Mattioli⁴⁹ argues that benefits derived from mobility activities producing emissions of present generations will affect future generations negatively, creating a problem of global and intergenerational justice. Justice challenges involve also inequalities in the access to services and opportunities linked to transports, leading to social exclusion. Indeed, questions of justice in the field of transport have to do with the concept of basic needs, which Mattioli⁵⁰ defines as a series of needs that are the same

⁴⁸ European Environment Agency, "Transport and environment report 2022 Digitalisation in the mobility system: challenges and opportunities", Luxembourg: Publications Office of the European Union, 2022, <https://www.eea.europa.eu/publications/transport-and-environment-report-2022/transport-and-environment-report/view>.

⁴⁹ Mattioli, Giulio, "Transport needs in a climate-constrained world. A novel framework to reconcile social and environmental sustainability in transport", *Energy Research & Social Science* 18 (2016): 118-128, <https://doi.org/10.1016/j.erss.2016.03.025>.

⁵⁰ Mattioli, G., "Transport needs in a climate-constrained world".

for all individuals. An example of this is access to paid labour, that in most societies represents the source of income that allows the satisfaction of other needs. Therefore, transports are a key opportunity for the fulfilment of this essential need, ensuring social inclusion.

In addition, recent digitalisation of transports is presenting some challenges to society, such as digital inclusion, data protection, and cybersecurity. On the one hand, digitalisation has the potential to enhance social inclusion. Some examples are the development of accessible transport solutions for disabled people or people with limited mobility, or the provision of online transparent information for all, fostering a socially inclusive information. On the other hand, digitalisation of transportation can lead to social exclusion. For instance, technology can represent a barrier for individuals who do not have access to it or are not proficient in using it. Another social issue linked to digitalisation is linked to data privacy and the ownership by transportation companies of personal data of customers. Moreover, many digital platforms are concentrated in urban areas, reinforcing the disparities with rural communities, who have a limited access to digital solutions.

Addressing the eco-social dimension of the transport sector can be highly challenging, as in the case of car dependence⁵¹. Car dependence is a phenomenon that occurs when there is a high level of difficulty in avoiding car use even if awareness of the negative impacts of cars is rising. In particular, it is possible to identify car dependence when car use is fundamental to access services, opportunities and social networks that are crucial to satisfy human needs. Indeed, on the one hand, formulating environmental policies such as increasing fuel taxes or road pricing can be considered unfair for those living in rural areas, who cannot benefit from access to public transportation or cannot afford electric vehicles. On the other hand, promoting car ownership decreasing carbon taxes, for example, in favour of those who do not live in urban areas, has a negative impact on environment. Therefore, because of this conflictual relationship between different policy

⁵¹ Mattioli, G., "Transport needs in a climate-constrained world".

angles, a big formulation effort and a multi-faced approach are needed in order to identify synergies between social and environmental policy dimensions.

As Garting points out⁵², in the framework of urban governance, where local decision-making and the implementation of mobility policies occur, many challenges arise. Indeed, one of the main issues in this area is implementation deficits, linked to resource scarcity, gaps in expertise, institutional inertia and conflicts in public administration. As a matter of fact, public administration usually disposes of a separated and fragmented structure that hinders synergies between different policy domains. Van Stigt⁵³ identified five obstacles to policy integration:

1. The qualitative multiplicity of urban sustainability (i.e. its multi-faceted character);
2. The necessity to adopt a bounded rationality in decision-making because of connected policy issues;
3. The limited use of expert knowledge and the fragmented character of different professions;
4. The limited possibility to act of local authorities;
5. The inadequate and unclear devolution of authority.

In addition to these challenges, eco-social integration is a politically embedded issue which very often depends on political debates, compromises and balancing decisions⁵⁴.

1.3 Eco-social integration: an overview of the EU's mobility policies

This section analyses the main EU policies in the mobility sector, with a focus on urban transports. In particular, the way in which the European Commission has dealt with the eco-social dimension of policy problems in a long-term perspective will be illustrated .

⁵² Garting, Lisa et al., "Sustainable Welfare in Swedish Cities".

⁵³ Van Stigt, Rien, "Contemplating 'Quality Street' : integration of environmental quality in planning sustainable urban development.", PhD diss., (Utrecht University, 2016).

⁵⁴ Garting, Lisa et al., "Sustainable Welfare in Swedish Cities".

The research covers the evolution of EU transport policies from 1992, when the Communication for the future development of the Common Transport Policy was issued until 2020 when the Smart Mobility Strategy was approved within the framework of the European Green Deal (EGD).

1.3.1 The first efforts towards the adaptation of sustainability to the transport system

The 1992 Communication for the future development of the Common Transport Policy⁵⁵ starts recalling the article 2 of the recently signed Maastricht Treaty, which pursues a sustainable growth, which respects the environment, protects employment and society, raises the standard and the quality of life and economic and social cohesion, while producing economic success. The intention is, therefore, that of adapting this integrated logic to transport policy in the EU. However, it is evident that, at least on a communicational point of view, the social dimension is prioritised, with a majority of social aspects highlighted (employment, social protection, standard of living, quality of life, cohesion, solidarity), while only the respect for the environment is mentioned in the article. Nonetheless, 1992 is considered by the document as the starting point for the integration of environmental objectives into other policy fields.

The second chapter of the 1992 Communication includes a section dedicated to current environmental and other pressures. The main environmental issues identified are the following:

- Energy consumption;
- Operational pollution;
- Land intrusion;
- Congestion;
- Risks inherent to the carriage of dangerous goods;

⁵⁵ Commission of the European Communities, “*Communication from the Commission – The future development of the common transport policy: a global approach to the construction of a Community framework for sustainable mobility*”, 1992, <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:51992DC0494>.

- CO2 emissions;
- NOx emissions;
- Particulates;
- HC emissions;
- Water and soil pollution;
- Depletion of natural resources;
- Environmental degradation at global level.

Among these problems only some are explicitly associated to social issues, being detrimental to human health, such as for example, hydrocarbon emissions, which have carcinogenic effects. However, social issues in the field of transport are mainly described separately from the environmental ones.

Social issues linked to mobility, listed in the second chapter of the Communication, not associated to the environmental dimension, are the following:

- Physical damage to persons and property like fatal accidents;
- Social cohesion (disparities between regions and backwardness of the least favoured ones);
- Accessibility of the regions to transports;
- Safety.

These social issues are considered independently from the environmental dimensions and even if they are numerically less than the environmental problems identified, they are stressed more than once in the chapter. For instance, safety is the social aspect which is oftentimes repeated in the text.

Despite the fact that environmental and social issues in the mobility sector identified by the Communication are described quite separately from each other, the majority of them is related to each other. That is why they should be considered in a broader perspective in order to insert in the policy documents all the possible consequences that such issues can cause. For example, in the field of transports, clean and sustainable energy sources and public transports are more environmentally-friendly than fossil fuels

but their introduction and development in the sector can create disparities among society, with marginalised groups who live in rural areas having a limited access to public means of transports and not able to afford electric cars. Moreover, congestion can represent a problem both for pollution and CO2 emissions, and for the quality of life and safety of citizens.

Therefore, considering these issues from the social perspective only means underestimating several other aspects related to them.

The Communication's section dedicated to policy responses to environmental problems stresses that environment and society are mainly considered in a sectorial way.

As far as energy consumption and operational pollution is concerned, the Commission elaborates instruments that have to do with higher standards, stricter requirements and inspections, promotion of R&D, development of cleaner fossil technologies, accelerated deadlines, and the development of the "polluters-pay" principle.

The Commission deals with congestion by optimizing spare capacity, promoting collective transports through an enhanced accessibility and information campaigns, fostering the use of bicycles and e-cars and discouraging citizens from using private cars, for example by reducing accessibility to city centres.

The carriage of dangerous goods is the only issue that has been explicitly linked to environmental damages due to its relevance for human life and safety. This problem is tackled through harmonisation of labelling and packaging, technical systems for their location and an improved liability regime.

Similarly, the section dedicated to policy responses to social issues shows a fragmented approach as well. Indeed, the actions highlighted to tackle social issues do not show any connection with environmental problems. For instance, the Commission aims at promoting social dialogue and collective bargaining in the field of mobility policies, in order to foster public participation in policy formulation about access to profession, training, living and working condition, as well as employment protection. Furthermore, action is taken in the area of recognition of qualifications and in order to improve living

and working condition at different levels of transports, such as roads, railways, civil aviation and maritime. Once again, the accent is on measures to increase workers' safety.

All in all, the Communication summarizes the main actions to be taken in the context of the Common Transport Policy. Initiatives which aim at integrating the ecological and social dimensions are the following:

- Creation of an action programme which integrates citizens and workers' safety, social issues and environment. However, it does not specify in which way these two dimensions will be jointly tackled and with which instruments within the action programme;
- In the field of intermodal transport the Commission wants to have a favourable tax treatment for road vehicles which respect safety's norms and environmental standards;
- As far as airports are concerned, the Communication claims that noise pollution have an impact both on the environment and on the population living around, with the need of the establishment of standard and systematic monitoring methods to control the levels of noise pollution.

All the other environmental and social issues connected to transport policy are tackled separately, without creating connections between their different impacts.

1.3.2 2001 White paper: economic growth as the overarching principle in the pursuit of sustainability

The second policy document under analysis is the Commission's 2001 White paper "European transport policy for 2010: time to decide"⁵⁶.

From the first lines of the document it is possible to understand that the social dimension is central in this policy proposal. Indeed, the Commission highlights the contradiction

⁵⁶ Commission of the European Communities, "White Paper – European transport policy for 2010: time to decide", 2001, <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52001DC0370&from=SL>.

between societal demand for more mobility and negative public opinion about the poor quality of transport services in the EU.

The first paragraph also mentions the need to undertake a sustainable development approach and to create a modern transport system that has to merge the economic, social and environmental dimensions. Therefore, as the 1992 Communication, this White Paper has the intention to build a mobility system that is integrated from an eco-social point of view. The second paragraph focuses on the economic importance of transport sector, accounting for more than 10% of the European GDP.

It can be argued that the first explanatory part of the policy document places the social and the economic dimensions at the centre. Indeed, a brief description of social issues related to transports is provided, such as the unsatisfaction of the users and the low quality of services. In addition, a short explanation of the economic benefits deriving from this sector is given, for example the share of people employed and the high expenditure associated with transports. Nevertheless, the need to tackle the environmental impacts of transports is just mentioned and not described as in the cases of the social and the economic dimensions.

One of the main issues identified by the policy document is congestion. For example, airports delays are associated with an extra consumption of 1.9 billion litres of fuel per year. However, consumption is primarily associated with an economic loss, while environmental damage and accidents are only mentioned.

Section IV under the chapter dedicated to the guidelines of the White Paper is entirely dedicated to the need to deal with transports adopting a sustainable development approach. The main issues of this sector are presented as follows:

- In 1998 the transport sector was responsible of 28% of CO₂ emissions in the EU;
- CO₂ emissions are expected to rise by 50% by 2010;
- Road transport is the main source of CO₂ emissions;
- It is necessary to stop oil dependence and rely on alternative fuels: this is an ecological necessity and a technological challenge;

- It is necessary to preserve air quality and fight against noise pollution in order to meet the needs of environment and the discontent of the people without damaging the economy.

The main problems described to be tackled through a sustainable development strategy in this section seem quite poor, identifying air quality and noise as the only issues characterised by ecological, social and economic issues. As a matter of fact, CO2 emissions are considered as an environmental problem alone and the elimination of fossil fuels are seen as an environmental need and a technological challenge for finding new substitutes. The social dimension here is just briefly mentioned but not analysed. For instance, the replacement of fossil fuels could have a big impact on people working with these kinds of energy sources, or can generate higher costs that cannot be afforded by low-income individuals.

Section V deals with the need for a comprehensive mobility strategy administered at the national and local levels. As far as the social dimension is concerned, it calls for:

- A better urban and land-use planning, that takes the distance between home and work into consideration;
- An improved social and education policy that regulates working and school hours in order to better manage overcrowding roads.

While as to the environmental dimension, the policy aims at finding a balance between modernisation of public transports and a more rational use of personal car in order to reduce CO2 emissions. All the other elements presented in the strategy deal with the economic dimension of this sector.

Also, in this section, the ecological and social policy fields are tackled separately and are poorly taken into account compared to the economic aspects of this sector.

The White Paper, therefore, draws up a very long action programme which deals with the interaction between the social and environmental in a quite superficial way.

Indeed, in its first pillar “Shifting the balance between modes of transport”, the main social aspects considered are:

- The promotion of the necessary skills and of satisfactory working conditions in the road transport profession;
- The promotion of a regulatory framework for safety controls for passengers and social rules to be observed in maritime and inland waterway transport system.

The main environmental aspects which are tackled by the policy document are the following:

- The urgency to reduce environmental impacts, especially greenhouse gas emissions, in airports and to balance growth in air transport and the environmental preservation.

As far as the revitalisation of the railways system is concerned, the White Paper identifies the gain in energy efficiency and the consequent reduction in emissions of pollutants, as well as the need to safeguard of users' rights, obligations and safety and to reduce noise emissions generated by trains. The railway system is one of the only sector in which both environmental and social concerns are considered, even if not in an explicitly and interconnected way. An example of an integrated approach to railways could be promoting the use of trains to produce environmental benefits, such as the reduction of the circulation of private vehicles, that would reduce greenhouse gas emissions and, consequently, influence people's health and safety positively. This promotion should be combined with an improvement of rail connections in order to guarantee the possibility for all to access such a service. In this way, in addition to environmental gains, human health and social justice conditions are also taken into consideration.

An entire section of the document is dedicated to the social component of the White Paper, aiming at assigning the users a central position in transport policy. In this part, the most crucial aspects are road safety, transparency about costs arising from the use of infrastructure, the reduction of pollution and congestion, users' rights and the promotion of the principle of subsidiarity. As far as transparency is concerned, the document calls for a fairer taxation system. Indeed, it suggests to opt for "user pays" and "polluter pays" principles, rather than an indistinct taxation system. This is an example of environmental justice approach, where those creating more damages to the

environment are supposed to pay more than those who produce less environmental impacts.

Yet, transport is described not only as a commodity of the market, but also as a public service, aimed at creating benefits for society. From these lines it is possible to understand that this sector is mainly conceived in economic terms, with its social aspect being secondary but in need of further attention. In terms of user-friendly efficiency, the document aims at enhancing integrated ticketing, baggage handling and continuity of journeys. Furthermore, users' rights are mainly described in terms of compensation for delays, and obligations with respect to irresponsible behaviour.

All in all, the most cited environmental actions to be undertaken in this framework are:

- The reduction of greenhouse gas emissions;
- The promotion of environmentally-friendly modes of transports, vehicles and infrastructures;
- The promotion of energy efficiency;
- The increase of alternative fuels.

Similarly to the 1992 Communication, environmental and social problems are considered in a quite disconnected manner. Besides, in this White Paper, the identification of environmental issues is limited to greenhouse gas emissions, ignoring other important ecological problems such as landscape damages, biodiversity loss, soil wastes⁵⁷. Likewise, social aspects mainly focus on safety, while health, justice and skills concerns are only partly tackled. Furthermore, the integration between the economic, environmental and social levels occurs in a few cases and it is not explicitly underlined.

1.3.3 2006 Communication: a first concrete step towards sustainability

⁵⁷ OECD, "The Environmental Impacts of Increased International Road and Rail Freight Transport Past trends and future perspective", 2008, <https://www.oecd.org/greengrowth/greening-transport/41380980.pdf>.

The 2006 Communication of the Commission⁵⁸ represents a step towards a more integrated approach to EU mobility policy. Indeed, it underlines the connection between the environmental, social and economic dimensions several times and for different mobility policy issues.

The policy documents' first lines claim that EU transport systems need to deal with the economic, social and environmental needs of society, and that effective transportation systems have relevant effects on economic growth, environmental protection and social development. Therefore, on a communicational level, this document unambiguously stresses the connection between the three policy dimensions and the need to tackle them in a comprehensive manner.

However, after having emphasised this linkage, the focus shifts to the economic relevance of the transport industry. Indeed, this sector corresponds to 7% of European GDP and for 5% of employment in the European Union. In addition, the last line of the first paragraph of the Communication highlights that mobility is considered an essential right. Thus, even if the importance of addressing the three dimensions of mobility policies is mentioned in the opening, an assessment of the environmental problems related to transports is missing in the first part of the document. This, indicates that priority is given to the economic and the social dimensions.

One of the goals of the policy is encouraging the development of efficient transportation systems that safeguard the environment, guarantee energy security, advocate for fair labour practices within the industry, and protect the passengers and citizens. Within this goal, the Commission specifies that environmental issues connected to transports have had a negative impact on health and environment. In addition, the social area of this objective is understood as the promotion of the improvement of employment quality, the qualifications of workers, safety and security of European citizens. This objective

⁵⁸ European Commission, "Communication from the Commission to the Council and the European Parliament - Keep Europe moving - Sustainable mobility for our continent - Mid-term review of the European Commission's 2001 Transport White Paper", 2006, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A52006DC0314>.

integrates environmental and social components, even if they are disconnected and put together without an straightforward link.

As far as environment is concerned, the main pressures are understood as:

- Air pollution
- Energy inefficiency;
- Greenhouse gas emissions.

Indeed, environmental aspects are mentioned in a quite general way, repeating several times the need to find alternative and innovative solutions to build environmentally friendly transports and modes. Along the text, other environmental challenges are mentioned, such as noise pollution and land use.

Furthermore, the document links the objectives of the Communication to the Lisbon Agenda for growth and jobs (2001) which, as also the title suggests, prioritized the economic and social policy dimensions.

The section dedicated to the context of EU transport policy points out that the main environmental issues of the densely populated and industrialised central and western parts of Europe are pollution, land use and congestion. Another major problem is accessibility, which is a relatively newly issue to the EU agenda in the field of transport.

Also, the Communication stresses that the field of transport is a high-technology demanding industry, with innovation having the potential to achieve the greening of land and air transport, the modernisation of air traffic management, decongestion, safety, security and competitiveness. This mention shows that in the framework of this policy there is the possibility to identify innovative solutions that have the potential to solve environmental, social and economic matters.

At the same time, the document recognises that the 2001⁵⁹ White Paper's expectations about progressive economic growth did not happen, and that the dispositions outlined

⁵⁹ Commission of the European Communities, *"White Paper – European transport policy for 2010: time to decide"*, 2001, <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52001DC0370&from=SL>.

were not sufficient, at least to deal with the negative environmental impacts of the transport industry.

The section dedicated to the impacts of the transport sector includes an analysis of the environmental and social costs. For instance, it mentions that air quality, is not in compliance with the EU standards in many cities, and that the infrastructure needs to be designed respecting nature. Besides, despite the reduction in emissions of NO_x and particulates in the last 15 years, CO₂ emissions and noise pollution are expected to increase. Also in the aviation sector, greenhouse gas emissions have worsened.

As far as the social dimension is concerned, the impacts are conceived in terms of safety, which, despite having improved, is problematic in road transport. Indeed, the policy document suggests the stimulation of a comprehensive debate on the future of mobility in order to develop tools for an integrated sustainable transport approach. Hence, the impacts of this sector are collected in the same section and the possible solution is seen as a set of comprehensive tools. However, although there is the willingness to bring these elements together, the link between the two dimensions are not underlined.

In the framework of the internal market, some social aspects to be implemented in the sector are mentioned:

- Road transport:
 - common professional qualifications;
 - common rules on working conditions;
- Rail sector:
 - Better market access rules;
 - Better rules on access to the profession;
- Waterborne transport:
 - Increase in quality employment.

Furthermore, the document explains how it is possible to develop a sustainable mobility for citizens. The first sub-sections deal with the social dimension, where the main aspects to work on are employment, working conditions, training, the stimulation of the motivation of youngsters, passengers' rights (included those with limited mobility), road

safety and security. The sub-section dealing with urban transport puts together the three different dimensions, addressing the environmental (CO2 emissions), social (road fatalities) and economic (increasing mobility) challenges. This part shows that urban areas are the places where social, environmental and economic problems are more evident and where the link between them is most visible. However, once again, these three policy aspects are mentioned in the same section, but they are not clearly and explicitly connected.

The section devoted to energy and transport calls for a decreased dependency on imported fossil fuels and opting for biofuels, natural gas, hydrogen and/or electricity. The paragraphs dealing with infrastructures stress the potential to cope with the eco-social dimension in a more integrated way. Indeed, the Communication underlines that the presence of congestion and pollution poses significant threats to economic growth, the environment, and the overall quality of life. According to the Commission, the tool that can tackle the three dimensions is intelligent mobility. Intelligent transport systems, indeed, could allow the tracing and tracking of flows in order to design policies that deal with both environmental and security matters. Also, smart infrastructure charging can have the benefit to employ revenues for future infrastructure investments, to fight congestion, discounting environmentally efficient vehicles and ensuring non-discriminatory and fair prices for citizens.

Finally, a novelty of the document is the introduction of the accessibility topic in the social dimension of mobility policies. Indeed, in the Communication it is underlined that peripheral areas need to be helped through transport policy instruments and state aids in order to improve their competitiveness and to link them better with urban areas.

All in all, the Communication “Keep Europe Moving – Sustainable mobility for our continent – Mid-term review of the European Commission’s 2001 Transport White Paper” seems a first concrete step towards the introduction of the eco-social dimension in the EU’s mobility policy. Nevertheless, the approach is still superficial and quite sectorial, dealing with only a limited number of topic in an integrated way.

1.3.4 A turning point for the environment, a step back in terms of eco-social policy integration

As the title “Greening Transport” suggests, the main focus of the 2008 Communication⁶⁰ is improving the environmental dimension of the EU’s mobility policy, with a specific attention to climate change. Indeed, it is important to point out that in March 2007 the European Council stipulated an agreement⁶¹ with the aim of cutting EU’s emissions to 30% below 1990 levels by 2020, which is considered a pivotal moment for the EU’s climate and energy policy. The “2007 EU Climate and Energy Package”, indeed, set ambitious targets that aimed at reducing greenhouse gas emissions, increasing energy efficiency and fostering the use of renewables. Some of the main goals were the following:

- Reduction of emissions by at least 20% below 1990 levels by 2020;
- Achievement of 20% share of renewable energy by 2020;
- Increase of 20% in energy efficiency by 2020;
- Improvement of EU Emission Trading System.

These demanding goals are reflected in the Communication in the field of transport that compared to the previous Communications is almost entirely devoted to climate change objectives.

The 2008 document starts with a brief introduction about mobility as a key part of the quality of life dimension and a crucial element for the European Union’s competitiveness, underling, as in the previous cases, that transport policy is about economy and society first. However, the document also underlines the important impact that this sector has on society and on environment. Indeed, it highlights how damaging emissions are for

⁶⁰ European Commission, “Communication from the Commission to the European Parliament and the Council – Greening Transport”, 2008, <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2008:0433:FIN:EN:PDF>.

⁶¹ Commission of the European Communities, “Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee of the Regions – 20 20 by 2020: Europe’s climate change opportunity”, 2008, <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2008:0030:FIN:en:PDF>.

human health, local environment quality and climate change. Also, noise and traffic are considered as threats to citizens' wellbeing and safety in terms of accidents.

The crucial solution foreseen by this Communication is adjusting prices so that they take into account the real costs of mobility, in order to affect citizens towards a less costly behaviour, the use of cleaner vehicles, less congested infrastructure and differentiated travel times to avoid the creation of congestion. It can be argued that this approach is totally environment-oriented and does not take into account the social consequences of potential increase of users' prices. Moreover, it charges citizens with the environmental costs of the sector, as if they were the only responsible, and all equally responsible, for the ecological damages connected to mobility. At the end of the first section, indeed, it is stressed once again that the main goal is that of achieving the targets of the 2007 package, and that transports have to strongly contribute.

The Communication identifies the following five main negative impacts of transports:

- Climate change, which is described as the primary environmental issue, that needs to be tackled through actions to restrict CO₂ emissions from new cars, the inclusion of the aviation sector in the EU Emission Trading System, the application of differentiated circulation and registration taxes for cars on the basis of their emissions and increasing the share of renewable energy in road transport;
- Local pollution;
- Noise pollution;
- Congestion;
- Accidents.

It is clear that environmental effects of transports are prioritised over the social ones and are considered independently from their social and economic impacts.

The two main macro-measures identified to tackle these five issues are:

- Internalising the external costs of transports, taking noise, congestion, greenhouse gas emissions and other environmental problems into consideration when charging vehicles or infrastructures;

- Road charging, establishing a differentiated system based on the efficiency and the environmental performance of transports and providing Member States with a framework to better vary charges based on local pollution and congestion.

In addition, the Communication calls for complementary actions which include:

- Reducing rail noise in order to make this sector more acceptable by society and allowing its growth;
- In the climate change context, a legislation on NOx from aviation is proposed and a reduction in CO2 emissions in the road sector;
- As far as local pollution is concerned it suggests the exploitation of volatile organic compounds for their beneficial effects on emission limitation of smog during refuelling at petrol stations, as well as the reduction of the sulphur content of liquid fuels;
- Improvements in noise reduction in the rail and aviation sector, because of their negative impact on health;
- Tackling congestion through electronic toll systems (in addition to smart road charging systems);
- Cross-cutting actions, such as an action plan on urban mobility considering the five negative effects mentioned above and giving importance to the subsidiarity principle. Moreover, an action plan on Intelligent Transport System for Road to tackle congestion, increase safety and fuel efficiency is proposed. Another measure listed is decreasing the construction of new infrastructures to avoid habitat fragmentation and soil sealing.

To sum up, the Communication “Greening Transport” represents a turning point on an environmental level because it is far more specific on environmental issues and solutions than the previous policy documents. However, it can be also considered as a step back from the integration of the eco-social dimension level in comparison to the previous 2006 Communication, because it gives the absolute priority to the environmental side of the policy and confines the social dimension to safety and health, without giving any further details. No connections are built between the three dimensions, even if the

proposal of the action plan of urban mobility has the potential to be a comprehensive solution to the eco-social issues.

1.3.5 2009 Communication: eco-social insights but sectorial actions

Following the path of the 2008 Communication “Greening Transport”, the 2009 Communication⁶² on transport policy recognises more and more the need to work on environmental impacts caused by mobility modes and to create a transport system that takes the social issues related to it into account.

An innovative element of the Communication under analysis is that its introduction presents the transport sector as a complex system which includes a multitude of factors and impacts. Therefore, in contrast to the economic analysis that described mobility primarily as a source of economic growth for Europe and, later, as a right for European citizens, this Communication identifies the multi-faceted nature of transport policy. This vision is a fundamental prerogative for an eco-social approach, that conceives issues as complex and in need of multi-dimensional solutions.

Indeed, the Communication claims that the economic objectives pursued by the previous strategic documents have been achieved, with a substantial contribution to the development of the EU economy and its competitiveness. In addition, it underlines that improvements have been done also in terms of safety standards, security, passenger rights and working conditions. Thus, following the Lisbon Agenda for Growth and Jobs, the main social dimensions identified by the previous policy documents on transport policy and the economic goals are not the main priority of the present Communication because they already reached a satisfying level of success.

Indeed, according to the Commission, the major concern of the European transport system is sustainability, which is not a characterising feature of the sector yet. Transport

⁶² Commission of the European Communities, “*Communication from the Commission – A sustainable future for transport: Towards an integrated, technology-led and user friendly system*”, 2009, <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2009:0279:FIN:EN:PDF>.

is the sector that has increased its greenhouse gas emissions the most compared to 1990 levels. As a matter of fact, despite some progress has been achieved in air pollution reduction and road accidents, more action is needed to lower emissions of NOx and fine particles in urban areas. The Communication also recognises the particular damage that fine particles have on human health. Infrastructure expansion in the field of transport has also caused problems for habitat loss and landscape fragmentation. Moreover, 97% of energy sources in this sector still depend on fossil fuel, and air and noise pollution are identified as key and persisting challenges.

Climate change is described as a major problem for the transport sector, needing adaptation measures to deal with the vulnerability of the coastal infrastructures and ports and the safety of all modes.

A new social challenge identified by the Commission is the European phenomenon of ageing, which could represent a problem for public finances directed at maintaining transport infrastructure and funding public transports. In addition, an old population needs safer, more secure and comfortable transports.

Another novelty on a social level is the explicit conception of mobility as a fundamental freedom. Indeed, this sector is associated to the freedoms to work and live, to enjoy different goods and services, to trade and to establish personal contacts. This assumption gives transports an importance that goes beyond the mere economic and growth sphere, but makes this sector crucial for European citizens' lives. Indeed, transport policy not only pursues people's health, but also their well-being. In addition, the question of gender is introduced in the policy, aiming at fostering women's participation to jobs in the transport sector.

Furthermore, the questions of privacy and data protection are introduced as new rights in this field, since mobility policy has started to envisage technological innovation as a key solution to environmental and social issues. Indeed, the Communication calls for an improved virtual accessibility through information technology to public services, that can replace travel (therefore limited congestion, emissions, noise pollution, health problems connected, accidents, etc.).

Another novelty of this Communication is the special attention to the education of users about the effects of the transport system, with the goal of affecting their behaviour towards more sustainable modes. Importance is also given to the involvement of stakeholders and citizens in the process of decision-making and the recognition of the fundamental role of local authorities in the context of urban areas.

Also in this policy document, urbanisation is seen as an multiplier of economic, social and environmental challenges, where technology and ICT solutions produce more comfortable services, improve safety and security and reduce negative ecological effects, while at the same time promoting growth and protecting jobs. The Communication calls for the creation of an Action Plan on Urban Mobility that is presented more deeply in a subsequent Communication⁶³. Urban areas are recognised as crucial places for growth and employment, where sustainability, environmental and competitiveness issues, as well as health problems, needs of persons with limited mobility, families and children have to be addressed.

The Action Plan suggests to tackle these issues respecting the principle of subsidiarity, in a tailored way, designing the actions based on the specificities of the different urban areas. Moreover, it launches some short and medium-term specific actions to be programmed in an integrated way, which will allow for the creation of a future society which pays attention to citizens' needs, a harmonious living, people's quality of life and sustainability.

The promotion of integrated policies is one of the main topics of this action plan. The section dedicated to this theme, indeed, links an integrated approach with the complex feature of urban transport systems. Complexity is determined by governance issues, the connections between cities and their environs, transport modes' interdependence, the limits of urban space and the role of urban areas in the overall European transport system. In addition, an integrated approach is needed to insert transport policy in the

⁶³ Commission of the European Communities, *“Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions – Action Plan on Urban Mobility”*, 2009, <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2009:0490:FIN:EN:PDF>.

fields of environmental protection, land use planning, healthy environment, accessibility issues, social aspects of mobility, housing and industrial policy.

It is possible to assume the two aforementioned policy documents have been extremely important for the recognition of the need to address economic, environmental and social issues of the EU mobility policy in an integrated way. Indeed, the most important steps of the Action Plan on Urban Mobility of 2009 are as follows. On the one hand, an in-depth study of urban areas is advocated. The acknowledgement of the multi-faceted nature of these places in the field of transports can lead to a more efficient analysis of the eco-social dimension of mobility policies, since this approach is intrinsically complex and multi-dimensional. On the other hand, social issues are deepened and identified as more complex in comparison to previous Communications. Indeed, social issues related to transports are not confined to safety and security issues, but they are enriched with other aspects never considered before, such as ageing, public transports as a fundamental freedom and as carriers of well-being, privacy and data protection and gender equality. The recognition of the multiple social concerns related to transports give them a more equal importance with respect to environmental problems. Having a similar status, the environmental and the social dimensions (as well as the economic one, whose key importance is taken for granted), can be recognised as equally significant for society and environment, so that they can be tackled in an integrated way.

However, while some steps forward have been taken, paving the way to a better eco-social policy-making, integration is mentioned but not explained in the concrete measures proposed by the Action Plan. Indeed, it involves a series of separate and fragmented actions that address the different dimensions without putting them together in compound measures. Even if the first topic addressed is about fostering integrated policies, there are other two separated sections respectively dealing with citizens and the greening of urban transports. This shows that despite having in mind the need for a process of eco-social integration in the field of mobility, the Commission still conceives these branches as not completely linked to each other.

1.3.6 2011 White Paper: More ambitious actions, but a poor eco-social policy integration

The 2011 White Paper⁶⁴ starts acknowledging the importance of transports for economy and society. In particular, they are crucial to ensure citizens' life quality, economic growth and jobs at one condition: their sustainability. The document also points out that it is necessary to improve the EU response to its citizens' needs, as well as those of economy while taking account of environmental and resource limitations.

This premise shows that another environmental issue that has been mentioned since the Brundtland Report, but which was not really considered by previous transport policies is the concept of resource scarcity. This is, indeed, one of the main focus of this policy document, with oil dependency representing a problem for economic security and people's ability to travel. As a matter of fact, this sector is called to employ less and cleaner energy.

The White Paper continues to stress the fact that transport system cannot be considered as sustainable and it draws attention to the possible devastating scenario if status quo policies will continue to be implemented. In this framework, oil dependence, CO2 emissions, congestion and its environmental and social costs will remain central issues in the transport sector, with renewable energy representing only about 10% of the sources used.

The policy document calls for the reduction of greenhouse gas emissions of at least 60% by 2050 compared to 1990 levels in order to limit climate change, as well as to tackle noise and local air pollution. Vehicles have to be clean, with an improved energy efficiency and performance, focusing on the employment of sustainable fuels and propulsion systems. New technologies are seen as the key solution to greening the transport sector while increasing its competitiveness.

⁶⁴ European Commission, *"White Paper - Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system"*, 2011, <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2011:0144:FIN:en:PDF>.

Infrastructure investments are described as having the potential to formulate an integrated response to different issues of the mobility sector. Indeed, they can have positive effects on economic growth, creating wealth and jobs and facilitating trade, as well as promoting accessibility and the mobility of people. At the same time, infrastructure need to be planned reducing the environmental damages at the minimum level, respecting crucial natural assets like water, ecosystems and land.

Urban areas are considered once again as places where economic, environmental and social problems converge, but also where better solutions can be facilitated by vehicles size, connection and availability and the higher population density. As in previous policy documents, the main problems of cities are identified in congestion, air quality, noise pollution, CO2 emissions and road accidents.

In these areas it is possible to foster cycling and walking through mobility and infrastructure design, as well as the use of road passenger vehicles of reduced size, weight, with a higher degree of specialization, and public transports. Indeed, one of the key objectives of this White paper is halving the use of conventionally-fuelled cars by 2030 in urban areas, and eliminating them by 2050. Moreover, the employment of electric, hybrid and hydrogen technologies will reduce emissions and noise, allowing means of transports to travel by night, tackling the problem of daily congestion.

These solutions do not take possible social implications into account. Indeed, the introduction of vehicles which work thanks to new technologies could be too expensive for low-income social groups. At the same time, promoting public transport could be problematic for those living in the suburbs or in areas which are not connected to the urban centres though an efficient network of transport. The Communication talks about the need to improve modal shifts and connections between different means of transport but does not mention these specific social issues related to this necessary measure.

Therefore, even if the White Paper aims to achieve an improved convergence and enforcement of rules concerning safety, security, environment, service standards and users' rights at the EU level, and synergies between cleaner energy and health benefits,

air quality and competitiveness, a real connection between different policy dimensions is not provided.

The main components of the social dimension continue to be quality jobs, working conditions, skills, security, safety, ageing, accessibility, reliability of services, intermodal integration and passengers' rights. However, these issues are not described in relation to other environmental problems, but as separate and independent matters.

Furthermore, road charges are seen as a valuable option to collect money directed at influencing traffic and travel behaviour. Nonetheless, this indiscriminate measure can be a problem in terms of social inequalities, especially for those who are forced to use their car to reach their workplace and are part of low-income groups.

These are just some examples that show how environmental policies can create social inequalities in a vital sector, that enables society to satisfy their fundamental rights.

1.3.7 2013 Communication: the introduction of Sustainable Urban Mobility Plans

Urban mobility is the main focus of the 2013 Communication from the Commission⁶⁵. It can be seen as a step towards an enhanced integration of different policy domains, since, as it was analysed in the previous sections, urban areas are the nodes where economic, environmental and social issues converge. Indeed, urban mobility is considered by this policy document as the most problematic aspect of mobility policy, but also the one that can be tackled in the most innovative way, since 70% of EU population live in cities, where over 80% of GDP is produced.

The Commission calls for a strategy focused on urban areas, and not on the different modes of transport. It indeed recognises the need to achieve a step-change in this field

⁶⁵ European Commission, *“Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions – Together towards competitive and resource-efficient urban mobility”*, 2013, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A52013DC0913>.

in order to develop a sustainable transport sector. If the EU wants to reach this goal, the Commission underlines that it is crucial to go over the fragmented approach employed until now and go towards an improved integration.

According to the Commission, the path started with the 2009 Action Plan on Urban Mobility was successfully implemented, stimulating a broader debate on the topic of urban mobility, an exchange of best practices, financial support for projects in the field of urban transports and research and innovation. However, there is the need to move the actions from the broad European level to Member States, and in particular to cities.

The Commission calls for a new approach which has at its core the Sustainable Urban Mobility Plans (SUMP), where the EU's role is that of supporting local authorities with guidelines and concrete suggestions on how to successfully implement these plans. The development of SUMP should involve integration between various policy areas and sectors such as transportation, land-use and spatial planning, environment, economic development, social policy, health, and road safety. It should also involve cooperation among different levels of government and administration, as well as with authorities in neighbouring urban and rural areas. The innovative aspect of this approach, indeed, is that in order to ensure a connection between different policy domains, an integration between different layers of government and governance is needed. Thus, policy-makers, civil servants and politicians working in different policy areas should join forces in order to ensure an integrated approach to deal with mobility sector.

SUMPs, which will be analysed in detail in the following chapters, have a strong eco-social integration potential. However, the Commission does not explain how different policy issues are connected and neither how mobility policies can tackle interconnected eco-social problems.

The analysis of environmental and social issues related to the transport sector is not the core of this document. As a matter of fact, almost the entire Communication is dedicated to SUMP and other initiatives that can work as guiding lights in this sustainable path.

1.3.8 2016 Communication: lowering emissions as the main goal

The 2016 Communication “A European Strategy for Low-Emission Mobility”⁶⁶ is entirely dedicated to lowering emissions produced by EU mobility, as the title suggests. As a matter of fact, contrarily to previous policy documents, whose introduction focused mainly on the economic and social importance of the transport sector, this Communication starts with the assertion of the cruciality of diminishing the production of emissions in this sector. Indeed, this focus on lowering emissions works in parallel with the recent adoption of the First circular economy action plan⁶⁷ in 2015, which states the potential of circular economy in this domain. Besides, in the introduction, the EU’s commitment to the Paris Agreement on climate change and the 2030 Agenda on Sustainable Development is stated. The document reflects a period of strong efforts towards a general environmental improvement in Europe, where in the field of transport the ambition is achieving a reduction of 60% of greenhouse gas emissions by mid-century, compared to 1990 levels. By contrast, the social dimension of this policy is totally overlooked, while the Communication clearly states that the priority is reducing emissions generated by transports and working on air pollution. The other sectors contribute to this goal, but they are not considered to be central for this policy.

Another relevant aspect related to emissions reduction is exploiting the opportunities brought by new technologies. Indeed, the latter are seen as the potential drivers of decarbonisation but also of sustainable growth. They can make European car manufacturers and companies the leaders of global standards and incentivise exports. In addition, the introduction of technology can create new jobs. Digitalisation is seen as a potential solution for transport safety, efficiency and social inclusion. However, no

⁶⁶ European Commission, “Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions – A European Strategy for Low-Emission Mobility”, 2016, <https://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX%3A52016DC0501>.

⁶⁷ European Commission, “Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions – Closing the loop – An EU action plan for the Circular Economy”, 2015, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52015DC0614>.

details are given to explain how digital technologies can put together different issues related to mobility.

An example of the lack of integration between the social and the environmental domains can be found in the charging system proposed by the Communication. Indeed, it suggests to employ a distance-based road charging system in order to put the polluter-pays and the user-pays principles into practice. However, such a system does not take into account people who cannot afford living in the city centre and are forced to go to work by car, driving for longer distances, and an alternative is not provided. An option could be the improvement of public transport like buses and coach services, which is one of the goals of this document. However, in order to be considered an integrated policy, solutions should be presented in a connected way, showing how they can tackle a social problem arising from a policy tool (road charging) that deals with environmental impacts of car use. Instead, the strengthening of lorries, buses and coaches is merely considered on an environmental level. Indeed, the Commission aims at developing a certification of CO2 emissions and fuel consumption of public transports, as well as measures to reduce their emissions. The adoption of buses based on zero-emission technologies is also proposed through public procurement.

Furthermore, one of the main measures proposed by this Communication is the promotion of the use of innovative energy sources through the rolling-out of electric recharging infrastructures, natural gas and hydrogen filling stations. Vehicles based on clean energy, according to the Commission, need to become more and more significant in the market by 2030.

The only section dedicated to a social aspect is that devoted to skills. Nonetheless, they are not presented as connected to job loss because of the introduction of new technologies and the disincentive to rely on fuel-based transports, but just as an important tool to follow the transition towards clean mobility.

Finally, the Communication claims that the success of the Strategy depends a lot on cities and local authorities' actions, that will be carried out through sustainable urban mobility plans and the holistic approach enshrined in them.

1.3.9 The European Green Deal: a sustainable and smart mobility strategy

The Communication “The European Green Deal”⁶⁸ of 2019 has a section devoted to smart and sustainable mobility. The European Green Deal is the new green growth strategy of the EU that aims at tackling climate and environmental challenges, eliminating net greenhouse gas emissions by 2050 and decoupling growth from resource use, while ensuring a just and inclusive transition.

One of the pillars of this Strategy pursues the speeding up of the transition towards a sustainable and smart mobility. This objective puts users at the first place, with cleaner, more affordable, healthier and accessible options for their mobility. Indeed, the Green Deal Communication requires the creation of a new Strategy for mobility, where urban areas continue to be the central places where new solutions should be implemented.

In December 2020 the Commission published its Strategy for mobility⁶⁹ within the framework of the New European Green Deal. The first part of the document, entitled “Our vision”, differently from the former strategies which started with the introduction section, is peculiar if compared to the previous policies for European mobility. In addition to the title, the incipit of the first section is highly personalised, giving the social sphere a particular relevance. Indeed, the first sentence states that mobility and transports are important to “us all” because they are fundamental for going to work, meeting family and friends, as well as carrying out economic activities such as tourism, global supply chains for products in “our” shops and industrial production. Therefore, transport is a crucial facilitator of social and economic life of European citizens. Nonetheless, the Commission points out that costs related to mobility are considerable. Some of them are

⁶⁸ European Commission, “Communication from the Commission – The European Green Deal”, 2019, <https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1588580774040&uri=CELEX%3A52019DC0640>.

⁶⁹ European Commission, “Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions – Sustainable and Smart Mobility Strategy – putting European transport on track for the future”, 2020, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020DC0789>.

greenhouse gas emissions, noise, air and water pollution, biodiversity loss, accidents, road crashes, having a negative effect on people's health and wellbeing.

The Communication claims that all these negative consequences of mobility were not tackled by previous strategies, with greenhouse gas emissions having been constantly increasing along the years. Thus, mobility has to go through a greening process, fostering affordable high-speed rail network, increasing the installation of recharging and refuelling infrastructure of clean vehicles and the availability of renewable and low-carbon fuels, stimulating clean and active mobility in cities and supporting the improvement of health and wellbeing of people in Europe. Digitalisation will be one of the core tools in this process, useful to boost security, safety, comfort and reliability. Finally, mobility should be affordable, accessible for people with limited mobility and disabled people, rural and remote areas should be better linked, and the transport sector should provide good social conditions and attractive jobs, as well as the possibility for workers to reskill. These are the main features of this Strategy.

The first part of the Strategy, which summarises the essential areas around which actions should be taken, shows that the Commission aims at connecting environmental, economic and social issues of mobility policies. In particular, health and wellbeing are presented in relation to the main environmental problems of transports. Digital solutions are described as tools that potentially tackle social aspects, while other social needs like affordability, accessibility, better connection and job conditions are addressed separately. The Strategy is structured around 10 flagship actions that address the specific aspects of mobility.

The first pillar, which deals with accelerating the adoption of vehicles with zero emissions, promoting the use of renewable and low-carbon fuels, and developing the necessary infrastructure, focuses on these environmental challenges, with little attention to social issues connected. The only aspect analysed in an integrated way is the need to promote high-performing tyres because they could tackle noise pollution and the production of microplastics, contaminating waters and entering the food chain.

The second flagship activity, which has the goal of reaching zero-emissions in airports and ports is mainly dedicated to make these areas clean, increasing substantially zero-emissions cars, lorries, buses, heavy-duty vehicles, vessels and aircraft.

The third backbone of the Strategy shows its integration ambition right from the title, having the objective of increasing interurban and urban mobility's sustainability and health. This part is introduced by the acknowledgement that boosting sustainable transports alternatives should be associated with reasonable costs, an increased availability, an equal speed, as well as an improved safety, competitiveness and affordability. Rail are an example of sustainable option that should be made more available. The Commission underlines that it is possible to enhance their appeal to customers through the promotion of fair and equitable access to travel information, for example through ticket offers. This is how the Commission attempts to push for sustainable transports use through improved conditions for society. Moreover, this section calls for the promotion of collective transport, cycling and walking and automated, connected and multimodal mobility in order to decrease pollution and congestion while also enhancing people's health and well-being. However, this statement does not go into the details of possible provisions that could combine the solutions of such problems and does not explain why these issues are connected to each other. The only indication provided is that cities should be the guiding figures in the promotion of these integrated actions. Once again, the great potential of urban areas is recognised.

Flagship four is entirely devoted to the process of greening of freight transport, while the fifth deals with pricing carbon and offering improved incentives for users. This last section supports fair and efficient pricing in each transport mode, based on the "polluter pays" and "user pays" principle, as well as the elimination of fossil-fuel subsidies and the implementation of effective charging for infrastructure use. No attention is given to possible negative impacts of increasing taxation on low-income people.

The sixth and seventh flagships address the transition towards a connected and automated mobility and the promotion of innovation, data and artificial intelligence to make mobility smarter. Digital solutions, indeed are said to be potential contributors to

sustainability and safety, without explaining how they can deliver such results. Another key action in this framework is the facilitation of electronic ticketing and paperless options, which will contribute to the green transition of the sector. However, the possible social concerns that can arise from digitalising the sector, such as accessibility of services by people with low skills in IT literacy or old people, considering also the issue of ageing in Europe, is not addressed in this section. Indeed, this and other social issues are taken into account in the ninth section, dedicated to the creation of a fair and just mobility. In this part of the strategy many social issues possibly related to previously mentioned environmental problems are grouped. Some of them are costs of transports for low-income people, accessibility for people with limited mobility and disabilities, those with a scarce IT-literacy and those living in rural and remote areas. In addition, questions related to job conditions are explained. Indeed, the Strategy aims at solving the problems of precarious working conditions, long working hours, low salaries and distance of workers from home. Moreover, the risk of job loss because of automation is mentioned, with the need of reskilling to avoid such a scenario.

It seems feasible to argue that the social dimension of the new mobility Strategy is partly integrated with environmental aspects addressed in the first sections. Although the majority of social concerns are described in a separate section, and are detached from the environmental ones. In this way, the links between the social and the environmental dimensions of policy problems and solutions are not always straightforward. These connection can still be grasped, even if they are not clearly and explicitly stated.

Lastly, flagship ten concerns transport safety and security. This is presented merely as a social question, while policies improving safety, such as lowering cars on the road and speed limits, increasing and improving public transports and infrastructure and enhancing active mobility, have also a beneficial impact on the decarbonisation of cities. Therefore, also in this occasion, different policy dimensions are not connected to each other.

1.4 Conclusion: a gradual and progressive path towards eco-social integration

All in all, the analysis of transport and mobility policies from 1992 to 2020 illustrates that progress has been made in promoting the linkage between social and environmental aspects. More specifically, the Communication “A global approach to the construction of a Community framework for sustainable Mobility” of 1992 and the White Paper “European transport policy for 2010: time to decide”, published in 2001, have mainly focused on the economic and social dimensions of mobility largely disregarding environmental concerns. The 2006 Communication can be seen as a first step towards an integrated policy, taking new social issues into account (for example, accessibility that links transport and social justice concerns) and identifying innovation as a potential facilitator of integration. In 2008, the Commission presented its main ambition to make the transport sector greener, together with other new European policies, including the EU Climate and Energy package. This was the first Communication which prioritised the environmental protection in the transport field, and which identified urban areas as potential mergers of the different policy dimensions. Following this direction, the Communication “A sustainable future for transport: Towards an integrated, technology-led and user friendly system of 2009 presented the sector as a multi-faceted system, requiring a multiplicity of solutions. One of the tools that, according to the Commission, could best tackle such a complex sector is the creation of an Action Plan on Urban Mobility, which puts technology and ICT at the centre of its integrated policy. In addition, in this framework new social issues are associated to the transport sector, such as ageing, privacy and data protection, users education and mobility as a fundamental freedom of citizens, expanding the scope of this field. In the White Paper “Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system” published in 2011, ambitious environmental targets were established, placing resource efficiency at the core of the policy. More and more specifications were provided

about urban areas as possible places where innovation can combine solutions to environmental, economic and social issues. These considerations about urban mobility gained importance in the Communication “Together towards competitive and resource-efficient urban mobility”, published in 2013, where the concept of SUMP was born. The Commission, in this context, underlined the fundamental role of the local level, as the main implementer of such integrated policies. Therefore, an integrated approach was not only required at the level of policy content, but also in the design, implementation and administration of such plans, where the EU, national governments and local authorities and stakeholders should cooperate. However, even if a favourable mindset for the creation of integrated policies was being built, details about possible eco-social interconnected issues and policies were not clearly presented. In 2016, because of the recently adopted circular economy package and the commitments of the Paris Agreement, a focus on lowering emissions dominated the new policy on mobility. Finally, in the framework of the European Green Deal, the 2020 Sustainable and Smart Mobility Strategy better communicated the connection between social, economic and environmental dimensions. Nonetheless, different policy domains were just partly integrated, highlighting only a fraction of combined policy issues and instruments, and keeping sectorial divisions between the environmental and the social components. Urban areas were considered policy centres where the best eco-social connections can take place thanks to innovative solutions. Based on this analysis we assume that SUMPs are key enablers of integrated mobility policies which rely on policy innovation at the local level. Indeed, the development of the concept of SUMPs along the different transport strategies analysed corresponded to an improved integration of (or an improved understanding and willingness to promote) eco-social policies.

Chapter 2 SUMP concept and guidelines in Europe and Italy

This chapter analyses the Guidelines for the development and the implementation of SUMP at the European level, comparing their implementation in two different local contexts in Italy. As the overview below illustrates, the new EU Strategy has posed a specific focus on the newly emerged urban question, stressing its relevance for mobility policies. In the second part of this chapter, the concept of SUMP is presented, including its principles, benefits, how it works in practice and how can national and regional levels support their implementation. The third section deals with the Italian concept of SUMP and how these plans are presented, regulated and promoted by the Italian government. Finally, the last part is dedicated to the comparison between the operational parts of the European guidelines for the redaction and implementation of SUMP and the Italian ones, underlying which are the respective focal points. This analysis aims at understanding the most important elements that need to be addressed by local governments when they prepare and implement SUMP in Italy. In addition, the different sections explore how eco-social policy integration should be put into practice according to the two guidelines.

2.1 Why to focus on urban areas?

As mentioned in the first chapter, urban areas host 70% of European citizens, producing 23% of greenhouse gas emissions deriving from transports⁷⁰. This section provides more details about why the European Union and its Member States join their efforts in order to tackle economic, environmental and social issues in urban areas in view of the opportunities that Sustainable Urban Mobility Plans can offer.

⁷⁰ "Urban transport", European Commission, accessed August 10, 2023, https://transport.ec.europa.eu/transport-themes/urban-transport_en.

According to Amato⁷¹, the emergence of a new and pressing urban question is underlined by the following factors:

- Distressed urban areas;
- The effects of globalisation;
- The pauperization and pollution of the environment;
- Environmental weakness due to climate change and seismic risks;
- Ageing population;
- The changes of the family structure;
- Migratory flow pressures that foster social hostility against weak social classes;
- New social assets determined by new values and behavioural systems of the population;
- The weakening of the construction and the real estate sector;
- A worldwide recession process.

Specifically, social inequalities and their consequent spatial inequalities, in addition to evident climate change issues and a conception of mobility as a citizens' right, are some of the most relevant elements of the urban question. More in depth, the urban question is composed of three main sub-questions:

- Territorial questions arising from metropolisation phenomena, the metropolitan dimension of planning activities and the role of the construction of the public city in the requalification strategies;
- Environmental questions due to soil consumption, unsustainable urban growth, emissions and pollution caused by the structure of European urban mobility, based on road transports;
- Social questions linked to the liberalisation and privatisation processes of public services, marginalisation and segregation territorial dynamics and to the conception of public city as a place for inclusion and resolution of conflicts.

⁷¹Amato, Chiara, *Il diritto alla mobilità – Riequilibrio territoriale, mobilità sostenibile e inclusione sociale nelle strategie di rigenerazione urbana*, Roma: Aracne Editrice, 2021, 73-92.

An important element in this context is the relationship between the crisis of the public space and the crisis of mobility. Indeed, planners of cities' public spaces have progressively reduced the space dedicated to people and their social activities, giving priority to vehicle flows, causing a decrease of citizens' life quality. This is also due to the loss of pedestrian zones and accessibility to neighbourhood services, which are the basis of daily activities⁷².

Moreover, public transport systems are often designed as a response to citizens' demand, without the elaboration of integrated analysis of the effects of mobility choices and their influence on territorial equilibrium and social inclusion. Public mobility, in this way, becomes a mirror of social inequalities. As a matter of fact, traditional transportation planning models usually build on some "economic man" assumptions, which are based on the idea that people take rational choices in order to maximise the profit related to every kind of situation⁷³. However, people often do not dispose of perfect information on available alternatives and do not always behave according to an economically rational logic. That is why, in addition to the necessity to tackle environmental and economic questions, urban mobility plans need to place citizens' quality of life first. This means creating plans based not only on their demand, but also on opportunities that can be maximised by considering social concerns, integrated with the environmental and economic dimensions.

Besides, environmental, economic and social issues are overcoming the traditional metropolitan areas, underlying the need of considering more ample territories. For instance, there is evidence of a process of governance redefinition, that involves new typologies of actors, different from official local governments. Therefore, it is necessary to adopt more flexible and soft forms of planning through policies that integrate different domains and facilitate actors and stakeholders' inclusion in policy-making.

⁷² Amato, *Il diritto alla mobilità*, 73-92.

⁷³ Fox, Michael, Transport planning and the human activity approach, *Journal of Transport Geography* 3, no. 2 (1995): 105-116, [https://doi.org/10.1016/0966-6923\(95\)00003-L](https://doi.org/10.1016/0966-6923(95)00003-L).

2.2 SUMP preparation and implementation: the European guidelines

In this section, the updated edition of the guidelines for the preparation and implementation of SUMP⁷⁴ is analysed. This document has been provided by Eltis, the main European observatory in the field of urban mobility, supported by the Directorate General for Mobility and Transport of the European Commission.

The guidelines are introduced by a statement by the former Director-General for Mobility and Transport of the European Commission, that summarizes the main elements that need to be included in urban mobility policy. They can be listed as follows:

- Reduction of traffic-related noise and air pollution;
- Reduction of congestion and accidents;
- Improvement of life quality in cities;
- Innovative instruments;
- Political support;
- Participatory approach;
- Comprehensive planning.

Therefore, the Commission conceives the SUMP instrument as a strategic plan aimed at meeting the transportation needs of individuals and businesses within urban and peri-urban areas, with the goal of enhancing overall quality of life. This main objective, intrinsic to the SUMP logic, makes the affinity between SUMP and the concept of Smart Cities evident. Raising citizens' quality of life, indeed, is the ultimate goal of most of the smart city initiatives⁷⁵. This plan leverages established planning methods while also giving significant attention to the principles of integration, participation, and evaluation.

Therefore, in the main definition of SUMP, environmental needs are not highlighted. However, after an attentive analysis of the whole document, it is possible to notice that

⁷⁴ Rupprecht Consult, eds, *Guidelines for Developing and Implementing a Sustainable Urban Mobility Plan*, 2nd Edition, 2019.

⁷⁵ Castelnovo, W., et al., Smart Cities Governance: The Need for a Holistic Approach to Assessing Urban Participatory Policy Making, *Social Science Computer Review*, 34(6), (2016): 724–739, <https://doi.org/10.1177/0894439315611103>.

the concept of life quality does not only include social equity, citizens' health improvement and economic wellbeing, but also environmental quality.

In addition to these objectives, integrated transport modes, the combination of diverse instruments, coordination and consistency between different policy areas, a long-term strategic approach, the consideration of functional urban areas, the inclusion of different stakeholders and citizens and a systematic evaluation, make SUMP's substantially different from traditional transport plans. The former, according to the guidelines, usually focus on traffic and infrastructure, elaborate sectoral and divided plans with a short and medium-term vision, are based on administrative areas, are realised by experts in the field without involving other actors and carry out limited evaluations. In addition, traditional models' main unit of analysis is based on the concept of trip, meaning the movement of a mode of travel for a specific purpose⁷⁶. This can be problematic because these traditional transports models do not link the demand for travel to the social needs connected to it. Furthermore, they tend to plan transportation systems focusing on homogeneous population groups, without considering contextualised individuals' actions. In other words, this traditional modes of planning are not designed in an integrated way and, concentrating simply on users' demand, they do not take into account social and environmental issues involved in the mobility system.

SUMP's are driven by eight main principles:

1. "Functional urban area": this means that a city and its commuting area is covered by the plan, taking into account not only its official boundaries but also the real flows of people and goods;
2. Cooperation across institutional borders: this enables the elaboration and implementation of consistent and complementary SUMP's with other policies in sectors which are linked to mobility. In addition, a good preparation of a SUMP requires coordination with providers of mobility services, both public and private;

⁷⁶ Fox, Michael, Transport planning and the human activity approach, 106.

3. Involvement of stakeholders and citizens: in this way, people will develop a sense of ownership of the SUMP and its related policies, leading to an enhanced implementation;
4. Assessment of current and future performance: SUMPs should include ambitious but realistic targets and clear indicators to assess the results;
5. Definition of a long-term approach and a definite implementation plan;
6. Development of all transport modes in an integrated way: SUMPs should involve an integrated set of instruments that tackle issues of different nature and should cover every type of transportation, including walking and cycling;
7. Systematic monitoring and evaluation: this will be useful for eventual revisions and corrective measures in the implementation phase. Monitoring reports should be made available for the public;
8. Ensure quality: this can be done through the involvement of external quality reviewers or other governmental institutions, for example other regions.

The benefits that should be brought by SUMPs, according to the guide, are many and include improvements of health, safety, better and public transports, a substantial reduction of private cars, increasing public support and institutional unity and an enhanced liveability. Specifically, a better health is conceived by the document as a consequence of a reduction of CO₂ emissions, that will reduce premature deaths. Moreover, road safety can be fostered by active mobility, such as walking and cycling, and by a reduced use of personal car, leading to a consequent improvement of air quality and health. This insights underline an effort of correlation between the environmental (GHG emissions, air quality) and social (premature deaths, safety, healthy lifestyle) dimensions.

SUMPs also increase public support by involving stakeholders and citizens in the decision-making process, at the same time raising people's awareness of ambitious measures needed to promote more sustainable transport modes. This participatory approach to mobility planning leads to a series of benefits⁷⁷. Some of them are the

⁷⁷ Rietbergen-McCracken, Jennifer, *Participatory Policy Making*, CIVICUS, https://www.civicus.org/documents/toolkits/PGX_F_ParticipatoryPolicy%20Making.pdf.

promotion of better informed policy, because locals bring information, perspectives, ideas which derive from their direct experiences in the territory; the creation of more equitable policies, thanks to the consideration of people's needs and contexts, especially weak categories, facilitating their inclusion; an enhanced transparency and accountability, due to a stimulated sense of ownership and an increased attention of the people to how policies are implemented; an improved government capacity, since participatory policy-making is a new skill that local governments have to apply when dealing with SUMP; finally, the construction of a common understanding of complex issues, that can be better tackled uniting forces.

Furthermore, according to the guide, social fairness is ensured because economically disadvantaged groups have more possibility to find a job, since travel boundaries are eliminated. An enhanced and more sustainable mobility can also be beneficial for businesses, making highly qualified professionals more available to travel to urban centres and seek employment there. Therefore, SUMP have the potential to increase the quality of life of all, and not only of one social group at others' expenses. Finally, SUMP require cooperation between different sectoral departments, leading to the construction of a common vision and a stronger institutional unity.

The guidelines draw on the practical experience of European cities. Indeed, they are described as a recipe, meaning that they are not a fixed and rigid method based on chronological phases, leaving the possibility to carry out some steps in parallel. In addition, they should be aligned to national, regional and municipal plans and strategies, creating an integrated system, where SUMP are adapted to local contexts, pursuing the objectives of higher levels' strategies.

Governments are key actors in the assimilation of SUMP concept because they can intervene at different levels:

- They should provide all necessary information about SUMP in the national context, possibly creating a platform for the exchange of good practices among municipalities;

- National incentives should be provided for the elaboration and implementation of SUMP;
- National governments should grant cities the legal power to intervene in the mobility field, for example through fees and charges;
- National governments should make SUMP mandatory by law for cities characterised by certain size criteria.

2.3 SUMP preparation and implementation: the Italian guidelines

The definition of SUMP provided by the Italian Government, in particular by the former Ministry of Infrastructure and Sustainable Mobility (now called Ministry of Infrastructure and Transport) differs from the one proposed at the European level. From the vademecum⁷⁸ provided by the Ministry emerges that a SUMP (PUMS in Italian) is a strategic planning tool that develops a systemic vision of urban mobility (preferably related to the metropolitan city area), within a medium to long-term time horizon (10 years). It aims at achieving environmental, social and economic sustainability goals by defining actions whose goal is improving the effectiveness and efficiency of the mobility system and its integration with urban and territorial layout and developments.

While the European guidelines primarily focus on citizens' quality of life, the Italian official definition of SUMP highlights the importance of tackling environmental, social and economic issues of urban areas and enhancing the functioning of mobility systems, adapting them to different territories. Besides, the European guidelines include the guiding principles of the redaction and implementation of SUMP (integration, participation, evaluation), while the Italian version focuses more on what needs to be achieved rather than on how to do it. Indeed, the Italian definition identifies the time frame of 10 years of the SUMP strategies and does not mention functional urban areas, placing Metropolitan cities at the core. As a matter of fact, they are considered by the

⁷⁸ Ministero delle Infrastrutture e della Mobilità Sostenibili, *Vademecum per la redazione del piano urbano di mobilità sostenibile (PUMS)*, 2022.

Government as the social and economic focal points of the country and central nodes of the national and European transport network⁷⁹.

The Italian guidelines outline the mandatory macro-objectives that SUMP's have to include. The identification of the objectives is considered an integral part of the planning and monitoring phase, which will be analysed in the following section. However, it is more appropriate to list them in this section because they can illustrate what are the priorities of the Italian Government in the context of SUMP's. The mandatory macro-objectives are grouped as follows:

- Effectiveness and efficiency of the mobility system:
 - Improvement of the local public transport system;
 - Modal shift of mobility;
 - Congestion reduction;
 - Improvement of the accessibility of people and goods;
 - Enhancement of integration between the development of the mobility system and structure and the development of the territory (residential settlements and urban planning projections of commercial, cultural, and tourist attraction hubs);
 - Improvement of the quality of the road and urban space;
- Energy and environmental sustainability:
 - Reduction of use of traditional fuels;
 - Improvement of air quality;
 - Reduction of noise pollution;
- Road mobility security:
 - Reduction of road accidents;
 - Substantial reduction of the general number of accidents causing deaths and injuries;
 - Substantial reduction of the social costs derived from accidents;

⁷⁹ Ennio Cascetta, "La nuova pianificazione della mobilità urbana in Italia" (Event, Seconda Conferenza Nazionale sui PUMS, Bologna, IT, May 24th, 2018), <https://www.osservatoriopums.it/wp-content/uploads/2018/06/Ennio-Cascetta-La-nuova-pianificazione-della-mobilit---urbana-in-Italia.pdf>.

- Substantial reduction of the number of accidents causing deaths and injuries among weak users (pedestrians, cyclists, children and over 65 years old);
- Socio-economic sustainability:
 - Improvement of social inclusion;
 - Increase of citizens' satisfaction;
 - Increase of the employment rate;
 - Reduction of mobility costs (linked to the necessity of using private vehicles).

These macro-objectives need to be included in every Italian SUMP, and, in addition to them, those in charge of SUMP design can identify additional and non-mandatory objectives. Specifically, there are two categories of additional objectives. First, it is possible to identify goals related to other necessities linked to the regional, national or European frameworks or to potential funding programmes. Second, other specific objectives can be chosen, among the following ones:

- Improving the appeal of public transportation;
- Enhancing the appeal of shared transportation;
- Enhancing the economic performance of Public Transport (TPL);
- Enhancing the appeal of pedestrian and cycling transport;
- Reducing road congestion;
- Promoting the introduction of low-impact, environmentally-friendly vehicles;
- Reducing illegal parking;
- Streamlining urban logistics;
- Enhancing the energy and environmental performance of both passenger and freight vehicle fleet;
- Ensuring accessibility for individuals with reduced mobility;
- Ensuring mobility for the elderly;
- Enhancing vehicular circulation safety;
- Improving safety for pedestrians and cyclists;

- Increasing alternative modal choices for citizens;

It is possible to state that objectives listed by the Italian guidelines are many and are not integrated. They appear as a list of single goals, each of them dealing with a single policy area. There is not an apparent effort to construct objectives that include more than one domain. The consequence can be the identification of single and micro-tools that do not put together problems of different natures through integrated actions.

In the official websites of the Ministry of Infrastructure and Transport and of the Ministry of the Environment and the Energy Security, no other details about SUMP's theoretical framework are given, focusing more on the operational side of SUMP planning.

As the European guideline prescribes, the Italian Government has intervened in order to promote the assimilation of the SUMP concept at the national level. One of the main interventions in this context is the creation of the SUMP Observatory (*ENDURANCE ITALIA – Osservatorio PUMS*)⁸⁰, founded with the sponsorship of the former Ministry of the Ecological Transition, in 2016. The Ministry gave a contribution to Euromobility, a non-profit association aimed at promoting the role of the Mobility Manager, which takes care of the Observatory's management. The main sponsor of this project is *Rete Ferroviaria Italiana*, the society of the Group in charge of the management of the national railways infrastructure. The Observatory was born as an evolution of the European-funded project ENDURANCE, promoted by 25 Countries in Europe, assisting European cities and regions in the development of SUMPs, facilitating networking, mutual learning and the share of good practices. It aims at becoming a reference point for all Italian cities in the elaboration of their plans.

The Observatory's Manifesto provides some details about what acting within the SUMP logic means:

- Integrating mobility planning within urban planning and design, focusing on environmental, social, and economic sustainability issues;

⁸⁰ "Osservatorio PUMS – Endurance Italia", Euromobility, accessed August 01, 2023, <https://www.osservatoriopums.it/>.

- Adopting an organizational model of urban space that prioritizes people over vehicles, placing pedestrian and cycling mobility first;
- Enhancing participatory aspects in urban mobility planning by promoting the involvement of various stakeholders, including authorities, associations, businesses, professional organizations, citizens, and other parts of the population. This means creating dedicated spaces and opportunities for engagement, such as technical tables, working groups, fora, etc;
- Addressing ongoing challenges related to freight transport in cities, by combining effective logistical models with intermodal transport and the use of low-impact vehicles;
- Spreading the culture of sustainable, soft, and innovative mobility through educational, awareness-raising, and informative activities aimed at people of all ages;
- Encouraging shared forms of transportation, from conventional public transport to carpooling, bike-sharing, and car-sharing, while promoting the concept of "usage" instead of ownership;
- Valuing the role of technology in line with the smart cities approach, promoting its appropriate usage and dissemination as a tool to achieve specific goals rather than an end itself;
- Being prepared to tackle future challenges, such as the proliferation of "driverless" vehicles.

Therefore, while the Italian Government in its vademecum does not provide specific notions or translations of the SUMP concept in its national dimensions, the Observatory, goes into the details of the concept and makes its principles clear and available for Italian cities. The theoretical framework around the SUMP concept, indeed, is fundamental in order to enter its logic and create a suitable plan.

In addition to this, the Observatory is crucial for the exchange of good practices. Indeed, every year, the Association Euromobility organizes a SUMP national conference, which always leaves room for the exchange or the presentation of good practices. Moreover, all the cities that adhere to the Observatory have a dedicated webpage within the website, that illustrates their projects and initiatives.

The Italian government supports the proliferation of SUMP through a set of programmes that finance actions within this framework:

- Smarter Italy - this strategic program launches innovation procurements with the aim of satisfying the needs of local communities through the experimentation of emerging technological solutions in four intervention areas - smart mobility, cultural heritage, wellbeing of people and environmental protection⁸¹. According to the European Commission⁸², thanks to the innovation procurement tool, public administrations stimulate innovation by buying innovative products or services, often rooted in emerging technologies, increasing the quality of public services and producing a positive impact on domains such as mobility, health and environment. This is useful to avoid the exploitation of standardized products which are already present in the market.

Smarter Italy is financially supported by the Ministry of Economic Development, the Ministry of University and Research, and the Department for Digital Transformation of the Presidency of the Council of Ministers, and executed by the Agency for Digital Italy. The financial allocation for the implementation of the program amounts to more than 90 million euro⁸³.

⁸¹ "Smarter Italy", Dipartimento per la trasformazione digitale – Governo italiano, accessed August 13, 2023, <https://innovazione.gov.it/progetti/smarter-italy/>.

⁸² European Commission, "Commission Notice – Guidance on Innovation Procurement", 2021, <https://ec.europa.eu/docsroom/documents/45975>.

⁸³ "Servizi – Fonti di Finanziamento", Osservatorio PUMS - ENDURANCE Italia, accessed August 13, 2023, <https://www.osservatoriopums.it/servizi/finanziamenti/>.

- A dedicated Fund for the Sustainable Mobility Strategy was established with the budget law of December 30th 2021, n.234⁸⁴, with the aim of contributing to the “Fit for 55” package of the European Commission, with a budget of about 2 billion euro for the period between 2023 and 2034⁸⁵. The fund finances the renewal of eco-friendly buses, the acquisition of hydrogen-powered trains, the creation of cycling lanes, the development of intermodality in freight transport, the adoption of alternative fuels for ships and airplanes, airport transformations, and the renewal of vehicles for road transport. The half of the fund is allocated to interventions in urban mobility in Metropolitan Cities and municipalities with over 100,000 inhabitants. These interventions include the purchase of electric vehicles for local public transportation and the establishment of charging infrastructure, pedestrianization initiatives in urban areas, promotion of cycling mobility, and the creation of digital infrastructure for traffic management and monitoring. Moreover, a portion of the fund is allocated to reducing emissions in interurban road transport through the establishment of electric vehicle charging infrastructure and the acquisition of heavy-duty zero-emission vehicles. The remaining parts of the fund aim at reducing emissions in maritime transport, achieving energy self-sufficiency for airport infrastructure, supporting experimental projects for alternative fuels in air transport, promoting intermodality in freight transport and decarbonizing non-electrified railway lines.
- PN Metro Plus e Città Medie Sud 2021-2027 - this is a National program elaborated in continuity with its predecessor “Pon Metro 2014-2020”, with a budget of 3 billion euro⁸⁶. With respect to the previous program, the new one expands its intervention areas, related to the theme of urban development. In

⁸⁴ Bilancio di previsione dello Stato per l'anno finanziario 2022 e bilancio pluriennale per il triennio 2022-2024., Legge di bilancio n. 234 (2021) (Italia). <https://www.gazzettaufficiale.it/eli/id/2021/12/31/21G00256/sg>.

⁸⁵ The subsequent budget law for 2023 cut 50 million euro addressed to the Fund for the sustainability strategy for the years 2024 and 2025. Source: <http://documenti.camera.it/leg19/dossier/pdf/ID0002vol3.pdf>.

⁸⁶ “PN Metro Plus e Città Medie Sud 2021-2027”, PON Metro, accessed August 14, 2023, <http://www.ponmetro.it/home-2/pon-metro-plus-21-27/pn-metro-21-27-2/>.

particular, this initiative has a strong eco-social structure, planning interventions in the following fields:

- Urban renewal;
- Socio-economic and housing disadvantages in the suburbs;
- Green mobility;
- Social inclusion and innovation;
- Employment;
- Environmental and circular economy interventions;
- Energy saving in infrastructures and buildings;
- Innovative supply of digital services;
- Social development through culture, natural heritage, sustainable tourism and security;

In addition, the program addresses new actors, which are the “Medium cities of the Southern Italy”, with the goal of renewing weak areas, characterised by socio-economic and housing disadvantages.

- National Recovery and Resilience Plan (PNRR) - it was approved by the European Commission and it is included in the framework of the Next Generation EU Programme⁸⁷. The initiatives related to the field of SUMP's can be found in Mission 2 of PNRR, called “Green revolution and ecologic transition”, component “M2C3 – Energy transition and sustainable mobility”, with 23,78 billion euro at its disposal. In particular, investment opportunities for SUMP's can be found in the fourth measure “Developing a more sustainable local transport system”, which foresees the following investments lines:
 1. Strengthening cycling mobility;
 2. Development of rapid mass transit;
 3. Electric charging infrastructure development;
 4. Renewal of bus and green train fleets.

⁸⁷ Italia domani, “Piano Nazionale di Ripresa e Resilienza - #Nextgenerationitalia”, <https://www.italiadomani.gov.it/content/sogei-ng/it/it/il-piano/missioni-pnrr/rivoluzione-verde-transizione-ecologica.html>.

Also Mission 3 of PNRR “Infrastructure for sustainable mobility” and its components “Investments on the rail network” and “Intermodality and integrated logistics”, with a total of 25,40 billion euro, contributes to the realisation of the objectives of SUMP.

According to article 3 of the legislation of August 4th 2017⁸⁸, promoted by the Ministry of Infrastructure and Transport⁸⁹, for metropolitan cities, entities with an extended area, municipalities and associations of municipalities with a population of over 100.000 inhabitants, it is mandatory to elaborate and adopt SUMP. Moreover, SUMP have to be designed on a ten-year time horizon and should be monitored every two years in order to identify eventual variances with respect to the initial objectives. SUMP are conceived as essential tools to access State funds for the realization of new infrastructural interventions related to mass transportation systems.

Furthermore, according to Annex 1 of the legislation, local administrations are the main actors in charge of elaborating the plans. The Ministry, following the European guidelines, invite local administrations’ departments to cooperate, together with external technicians, experts in the field of territorial planning and transports, in order to build an inter-disciplinary working group.

Therefore, as the European guidelines prescribe, the Italian government works as a catalyst for the realisation of SUMP, because it supported the creation of a platform for the exchange of good practices, made several national incentives available, made the realisation of SUMP mandatory by law and granted municipalities the responsibility for the implementation of the plans.

2.4 The operational aspects of SUMP: comparing the European and the Italian guidelines

⁸⁸Individuazione delle linee guida per i piani urbani di mobilita' sostenibile, ai sensi dell'articolo 3, comma 7, del decreto legislativo 16 dicembre 2016, n. 257, Decreto 4 agosto 2017 (Italia), <https://www.gazzettaufficiale.it/eli/id/2017/10/05/17A06675/sg>.

⁸⁹ In Italian, this type of legislative act is called “*Decreto Legislativo*”, meaning an act which values as a law, adopted for complex or specific subjects by the Government, following a mandate by the Parliament.

In this section, a comparison between the European Eltis⁹⁰ and the Italian⁹¹ guidelines on the development and implementation of SUMP is carried out based on the analysis of their structures and contents. Also, this part aims at examining whether the Italian guidelines actually envisage an integration of the environmental and social dimensions in their plans, as the EU framework has prescribed.

The Eltis guidelines present a SUMP cycle based on four main phases, divided in twelve steps and 32 sub-activities. Every phase is preceded and followed by a milestone.

The first phase is dedicated to the preparatory and analytical process. In particular, since not every European city has a legal mandate to prepare and implement a SUMP, the starting milestone of the cycle is an explicit decision to prepare a SUMP. The guidelines suggest to make the challenges and the problems of the city visible to politicians and citizens in order to push towards concrete actions. This milestone is not necessary in the Italian guidelines because, as mentioned before, the redaction of SUMP is mandatory by law for certain city categories and is a prerequisite to access State fundings. In other words, in Italy there is already a strong public incentive to initiate the SUMP process.

The first step within this European phase is the setting-up of the working structures. First, this step includes an evaluation of the capacities and resources available based on a self-assessment, in order to make strengths, weaknesses and barriers clear before starting. Specifically, an analysis of the current transport planning activities is required in order to identify the elements which are already in line with the SUMP logic. Moreover, skills available need to be traced, and strategies to overcome skill gaps should be developed. Finally, it is necessary to define the likely budget needed to develop the plan. Political support is an important element to ensure that resources are actually made available for the construction of the plan.

Second, this phase involves the creation of an inter-departmental core team. Indeed, for the realisation of a successful SUMP, having a working group that cooperates across

⁹⁰ Rupprecht Consult, eds. *Guidelines for Developing and Implementing a Sustainable Urban Mobility Plan*, 2nd Edition, 2019.

⁹¹ Ministero delle Infrastrutture e della Mobilità Sostenibili, *Vademecum per la redazione del piano urbano di mobilità sostenibile (PUMS)*, 2022.

administrative boundaries and sectors and that activates a process of coordination between policies and organizations is crucial. This will allow the best use of resources available and the realisation of a SUMP which is integrated in terms of eco-social policy domains. In order to achieve this goal, it is fundamental to select a project coordinator (or two), who has responsibility, mandate and resources for the project, during the whole cycle. In addition, a more senior project director and a core team project owner should be appointed. These are the fixed figures that should be identified for the entire duration of the SUMP, who need to hold the necessary management, political, project, technical, financial and staff management skills. Furthermore, the guidelines suggest to include external actors, such as universities, researchers or consultants, that could be useful to cover the identified skill gaps.

The third activity listed consists of ensuring political and institutional ownership in order to achieve the long-term success of the plan. The involvement of stakeholders, indeed, is essential in order to ensure long-term successful outcomes. In addition to relevant stakeholders and the governing party, the guide invites local entities to include also oppositions in order to safeguard the continuity of the plan. Actors that work in different policy fields should be involved through a transparent and open process.

Finally, the fourth activity deals with planning stakeholders and citizens involvement, with the aim of further legitimising SUMP and increasing their quality, through transparent dialogues and regular communications and consultations. In this phase, it is crucial to assign specific activities to participating actors, rather than involving them in every action, in order not to slow the process. The development of communication and engagement strategies, employing innovative tools, can be useful to establish a proactive involvement process. Moreover, underrepresented groups should be treated like active actors in the plans, rather than beneficiaries.

The Italian guidelines are structured in a different way in comparison to the European ones. Indeed, Eltis document's first phase is transposed in the Italian vademecum as a unique section called "Preliminary Activities". Before starting any activity, the guidelines call for an accurate evaluation of available and activable financial resources by the

administration in charge of the preparation and implementation of the SUMP. The preliminary activities are divided in two main operational steps:

1. “Definition of the interdisciplinary/interinstitutional working group”

The actors in charge of the whole planning process of SUMP are working groups, that also have to manage the participatory process of citizens and stakeholders. Following the European guidelines, the group needs to cooperate across departments and administrative boundaries. In addition, the Italian guidelines require that the number of participants in this group is easily manageable, eventually increasing the actors just when specific thematic areas need to be addressed, rather than creating a big working group for the whole cycle. Moreover, components of the group have to be internal and external to the administration. In order to define the external members of the working groups, it is necessary to carry out an analysis of the internal competences in relation to the fields covered by the SUMP. In this process, the area Mobility Manager should be appointed as a mandatory figure in the working group.

With respect to the definition of the members of the working group, such as bordering municipalities, it is necessary to identify the geographical area of the plan, discussing it with citizens and stakeholders. This area corresponds to the functional urban area described by Eltis guidelines. For this reason, it is necessary to develop and analysis of the mobility flows. This phase is not linear, nor chronological.

2. “Planning of the participatory process”

The definition of the geographical area of the plan is fundamental also for the identification of the citizens and stakeholders to involve in the participatory phases. The document stresses that it is important to involve citizens, entities and associations that represent fragile categories.

Also, the timeline of the participatory process has to be decided before the elaboration of the SUMP, because people need to be involved in each operational step (predisposition of the framework, definition of the objectives, participatory

construction of the plan scenario, monitoring plan). Moreover, the adopted plan has to be public and available for citizens. The engagement strategies can vary, including simple information provisions, or the grant of some responsibilities to stakeholders and citizens.

This first step covers each main point of the European guidelines. However, the Italian version does not mention the figure of project coordinator, but relies on working groups, and adds the figure of the area Mobility Manager, without specifying its role in detail.

The second step of the plan cycle, as established by the European guidelines, has to deal with the determination of the planning framework. In particular, the first activity calls for the identification of the relevant European, national and regional legal requirements for the redaction of the SUMP and the definition of the geographic area of the plan. In the Italian vademecum, the analysis of other levels' strategies and policies that might influence the plan is not present in the second block of activities. Moreover, the definition of the functional urban area is an integral part of the preliminary activities. As prescribed by the Eltis guidelines, in the Italian case, the functional urban area is defined following an analysis of the mobility flows and according to a consultation of citizens and stakeholders.

The second step of the Eltis guidelines is the identification of connections with other planning processes. This part is fundamental in order to enable a fruitful cooperation between the different administrative departments, entities and organizations. Indeed, understanding the linkages of the plan with other strategies can be helpful in the context of the definition and coordination of policy objectives, as well as the specific social and environmental goals. SUMPs, indeed, may present many aspects that develop in synergy or may be in conflict with other fields, external to the transport sector (e.g. environmental policy, healthcare, social, economy and finance sectors). For example, in the Italian case, the collaboration between the Ministry of Transport and Infrastructure, the Ministry of Health, the Ministry of the Environment and Energy Security, as well as the Ministry of Economy and Finance and that of the Employment and Social Policies

would be fundamental for achieving efficient outcomes and avoiding overlappings and conflicts.

Another activity within this step is the agreement of a timeline and a work plan, which define the coordination of activities, the formalisation of roles and actors, and their resource contribution. The EU guidelines underline that at the core of the plan the principle of sustainability should appear, focusing not only on traffic management but also on environmental, social and economic benefits of mobility.

Finally, the following activity, according to the European guidelines, is the decision on whether to get external support, by employing experts which can contribute with innovative ideas and tools. This task is part of the Italian's preliminary activities.

Overall, the second step has been largely overlooked by the Italian SUMP guidelines.

The third step of the Eltis guidelines focuses on the analysis of the mobility situation and corresponds to the third step of the Italian guidelines. The European guidelines' first activity within this step is the identification of information sources and the cooperation with data owners. In parallel, in the predisposition of the framework, which is the third step of the Italian vademecum, a detailed description of the characteristics of the context and the urban mobility situation is required through an accurate data collection. Data collection, in both cases, should be carried out on a qualitative and quantitative level, engaging external and internal organisations and data owners, completing the dataset with citizens and stakeholders consultations.

In the Italian vademecum, in the framework of the definition of the urban context, a consideration of regional and national regulations, funds and strategies is prescribed in order to identify opportunities, synergies and possible conflicts, in line with the second activity of the second step of the Eltis guidelines. In addition, the part dedicated to the context should involve an overview of the territory and its socio-economic dynamics. After outlining this, an analysis of the mobility is expected, focusing on an examination of the demand for the mobility, comparing the effective demand and the actual supply offered in the functional urban area. In particular, the Italian guidelines provide a

detailed list of elements that must be filled in while preparing this framework, which are grouped under the following categories:

1. Regulatory, planning, and programmatic framework;
2. Territorial and socio-economic context of the planning area;
3. Transport network and services offered;
4. Mobility demand;
5. Interaction between transport demand and supply;
6. Issues and impacts;
7. Strengths and weaknesses, opportunities and threats.

This division between categories suggests that there is not an integrated view of mobility issues. For example, local environmental impacts are not presented as connected to studies on health issues, related to air quality and noise pollution. This lack might not foster an operational integrated approach to mobility issues, while strengthening a business as usual method. Moreover, no data on the general wellbeing of citizens is required. This can be problematic for the purpose of SUMP, which mainly aims at enhancing a better quality of life. Contrarily, the European guidelines call for data on users' satisfaction, for example suggesting a tool promoted by the Gehl Institute, which, among other goals, has the goal of exploring whether public urban spaces are enjoyable for people⁹².

The second phase of the European guidelines deals with the strategy development. In particular, the first step of this part (which is the fourth step of the overall strategy), involves the construction and the joint assessment of future scenarios. This means considering possible developments of urban mobility that cannot be controlled by local authorities (e.g. economic, demographic, technology, environmental phenomena), in order to have a clear understanding of current trends and future changes. Depicted scenarios should be at least three, including a business-as-usual situation and at least two other strategic alternatives. In addition, interdependencies between different

⁹² "Twelve Quality Criteria", CIVITAS, accessed August 16, 2023, <https://civitas.eu/tool-inventory/twelve-quality-criteria>.

sectors should be assessed within these different scenarios, in order to foster an approach based on integration of policy domains. However, the Italian guidelines place the definition of the objectives before the development of future scenarios. This can be problematic, since, according to Eltis guidelines, the outline of scenarios can be used as an inspiration for the selection of a strategy and its consequent objectives, targets and indicators.

The European guidelines requires that the possible scenarios are discussed with citizens and stakeholders, with the aim of developing of a common vision, based on the results of the debate. Accordingly, clear objectives, indicators and targets should be agreed.

As mentioned above, the subsequent step prescribed by the Italian vademecum is the definition of objectives. There is a set of mandatory macro-objectives (already listed in the previous section), which need to be present in every SUMP. It is possible to note that, also in this case, different goals are divided according to four building blocks (Effectiveness and efficiency of the mobility system; Energy and environmental sustainability; Road mobility security; Socio-economic sustainability). Therefore, explicit linkages between objectives belonging to different policy areas are not fostered. Accordingly, indicators suggested by the vademecum are not integrated, but they measure single factors.

In addition, an observation can be made in relation to the objective dedicated to the improvement of social inclusion. This issue is merely conceived as the promotion of a better inclusion of people with limited mobility. There are no references to problems of social justice, such as the improvement of the mobility of other marginalised groups of those living in the suburbs or in disconnected areas.

Moreover, the process proposed by the Italian vademecum is inverse with respect to the one suggested by the European guidelines. As a matter of fact, while in the European case, the discussion about future scenarios with citizens and stakeholders precedes the agreement of a vision, objectives, indicators and targets, in the Italian case, the public is consulted after the selection of the objectives. On the one hand, this methodology can be useful in order to simplify the process. On the other hand, there is the risk that citizens

and stakeholders' views will be partially considered, since the selections of objectives precedes their consultation.

So, in the Italian vademecum, the construction of the plan's scenario follows the definition of the objectives. The switch from a strategic level to the operational part is identified at this point. In particular, in line with the European guidelines, the first step in this phase is the definition of possible future scenarios, one in absence of a SUMP, and alternative possibilities, with coherent strategies and actions. The second step is the selection of the scenario, after a comparative evaluation based on a quali-quantitative analysis. The elements that the interdisciplinary group has to consider for this selection are the technical feasibility, commercial attractiveness, users' perception, costs and financial impact of every scenario, and the achievable result indicators. In particular, the most important indicators to be considered are those related to sustainable performances of means of transports, reduction of congestion, reduction of fossil fuels consumption, air quality improvement, increase of road safety and life quality levels. The document specifies that in both steps, citizens and stakeholders' views need to be considered. However, in the participatory activities the public should be treated as a beneficiary rather than an active actor in the decision-making.

The Italian guidelines provide a list of possible strategies that can be employed by local authorities to represent alternative scenarios:

1. Integration of transportation systems, including rapid mass transit systems;
2. Development of collective mobility to enhance service quality and increase the commercial speed of public transportation vehicles;
3. Development of pedestrian and cycling mobility systems, in order to consider walking and cycling as integral and fundamental parts of urban mobility;
4. Introduction of shared motorized mobility systems, such as car-sharing, bike-sharing, van-sharing, and carpooling;
5. Renewal of the vehicle fleet with the introduction of low-polluting and highly energy-efficient vehicles;

6. Rationalization of urban logistics, aiming at balancing the need of supplied goods necessary to enhance the economic and social vitality of urban centres;
7. Promotion of a safety-oriented mobility culture. Actions to protect vulnerable users and others aimed at minimising the consequences of accidents. Promoting an education based on sustainable mobility.

Based on the strategies selected, scenarios should be developed. These scenarios should include actions to be adopted, with relative objectives, interventions, a chrono program with estimated times (specifying interventions at the short, medium and long term), an economic and financial plan, possible funds and available resources, an estimation of achievable indicators' values through the implementation of planned interventions.

Phase three of the European guidelines deals with measure planning. This consists in the creation of a set of measures and the consequent assessment of their effectiveness and feasibility. This phase is considered as an integral part of the creation and selection of a scenario in the Italian vademecum. Therefore, this section is absent in the Italian version of the SUMP guidelines.

The first step within this phase (step seven in the overall cycle) involves the selection of measure packages, in collaboration with stakeholders, and comprises three activities. First, a long list of measures should be created and assessed, including innovative ideas, inspirations coming from other cities' experiences, through the engagement of stakeholders. Second, guidelines suggest to create integrated measure packages. This draws on the idea that isolated initiatives can have a limited impact, while a combination of measures can lead to more effective results. This should be carried out through grouping different measures, in order to benefit from synergies and improve their effectiveness. This part is totally absent in the Italian vademecum. This lack can represent a weak point in terms of eco-social policy integration. Third, monitoring and evaluation should be planned, including the allocation of responsibilities and budget. At least 5% of the SUMP's budget should be assigned to monitoring and evaluation activities.

The following step is about defining specific actions and responsibilities. In particular, measures should be broken into actions, identifying linkages between them. In addition,

funding sources need to be identified and financial capacities assessed. It is also possible to opt for financing instruments such as local taxes, revenue funding, fundraising activities, national or regional subsidies. Moreover, priorities, responsibilities and a timeline should be fixed. Finally, it is useful to promote actions that ensure political and public support. For instance, a transparent communication and the organisation of information sessions in order to receive feedbacks from key decision makers and citizens is fundamental for ensuring the implementation of the plan.

Overall, it is possible to state that these steps are overlooked by the Italian vademecum. Among them, the only stage which is included as an integral part of the Italian guidelines is the definition of a monitoring plan. Specifically, it is mandatory to publish a biannual monitoring report in order to trace the progresses of the SUMP. It is recommended to undertake an annual monitoring activity, focused on the realisation of specific actions and interventions. In this phase, it is fundamental to clarify the indicators' framework. This means defining indicators referred to macro and specific objectives, accompanied by short and medium-term targets, and indicators related to the realisation of actions decided in the construction of the plan scenario step. The monitoring plan should be presented to citizens and stakeholders.

The ninth step of the European guidelines deals with the preparation of the plan for its adoption and financing. Specifically, the activities included are the development of financial plans and the agreement on costs sharing and the finalisation and the assurance of quality of the SUMP paper. This last activity involves the compilation of the final draft of the SUMP, making final amendments and improvements, if necessary.

The fourth and last phase is about implementation and monitoring. In particular, the tenth step foresees management of the implementation, including the coordination of all actions, through regular meeting of the people involved in the plan, the identification of effects of some actions on others and the consequent risks. Another activity within this step is the collection of goods and services necessary for the plan implementation. The guidelines suggest to use innovative and green procurements in order to minimise

social and environmental repercussions through the adoption of innovative products and services.

The following step has to do with monitoring, adaptation and communication. This primarily includes the consideration of new developments regarding national regulations, technologies, funding and local politics. Therefore, plans need to be flexible and ready to adapt to unforeseen changes. As mentioned above, a clear communication that creatively engages citizens and stakeholders is fundamental for the final acceptance of the plan.

The twelfth and last step involves the process of review and lessons drawing, through the analysis of successes and failures, as well as the dissemination of results, public engagement and a reflection about new challenges and solutions. The end of this process is considered to be also the beginning of a new generation of SUMP, following the logic of the cycle.

The Italian guidelines includes several references to the EU's document, including its closing section. Indeed, the vademecum states that it is mandatory to update the SUMP every five years. As the European guidelines suggest, the Italian guide stresses the importance of taking account territorial changes related to sectoral technological innovations, environmental sustainability needs and economic dynamics. It recognises that the contextual characteristics of urban mobility should be evaluated regularly in order to understand whether the formulated strategies are still valid.

Overall, the European and the Italian guidelines follow the same cycle logic, establishing the creation of non-linear, flexible and adaptive plans. The key provisions included in the European document have been addressed in the Italian version though a schematic and concise way. However, the Italian document contrasts with the Eltis guidelines, which systematically prescribe to devote a special attention to the integration of different policy dimensions in order to maximise the benefits of the plan. Indeed, the connection between different policy domains is only prescribed in the section dedicated to the definition of the interdisciplinary working group. However, as the objectives identified by the document show, a push towards an eco-social policy integration effort is not called

for. This comparison is useful to analyse, in the next section, two concrete case studies, and assess how local governments have dealt with the application of these theoretical guidelines in practice, which tools and strategies they have selected and whether they propose eco-social mobility policies.

Chapter 3 The case studies of Padua and Rome

This chapter examines the case studies of the SUMPs of the Metropolitan Conference of Padua and of the Metropolitan City of Rome. In particular, the two main sections, after briefly describing the main geographical, demographical, socio-economic, mobility and environmental features of the two different contexts, focus on the analysis of the strategic framework and on the specific measures that the two plans propose. The analysis starts from the study of the Plan Documents^{93 94}. These documents are the final versions of the SUMPs and contain all the strategic and operational indications for the implementation of the plans. Moreover, an assessment on whether an eco-social integration of the policies proposed is present, illustrating the potential combinations of different policy domains when they lack. This analysis is carried out also considering the Strategic Environmental Evaluations of the plans^{95 96}, which, according to the national guidelines, are mandatory documents examining the environmental situation of the functional urban areas covered by the SUMPs.

3.1 Padua's case study: "PUMS Co.Me.Pa."

The territory covered by the SUMP is the Metropolitan Conference of Padua (Co.Me.Pa.), involving the municipalities of the province of Padua (Abano Terme, Albignasego,

⁹³ Comune di Padova, *Piano Urbano della Mobilità Sostenibile Conferenza Metropolitana di Padova Co.Me.Pa. – Report terza fase*, April 2019, https://www.padovanet.it/sites/default/files/attachment/PUMS-Padova-Report%20TerzaFase_DEF-4%20-%20firmato.pdf.

⁹⁴ Città Metropolitana di Roma Capitale, *Piano Urbano della Mobilità Sostenibile – Volume 3 – Documento di Piano*, December 2022, <https://pums.cittametropolitanaroma.it/sites/default/files/documenti/PUMS%20Volume%203.pdf>.

⁹⁵ Comune di Padova, *Piano Urbano della Mobilità Sostenibile Conferenza Metropolitana di Padova Co.Me.Pa. – Valutazione Ambientale Strategica*, November 2019, https://www.padovanet.it/sites/default/files/attachment/Rapporto%20Ambientale_VAS_PUMS.pdf.

⁹⁶ Città Metropolitana di Roma Capitale, *Piano Urbano della Mobilità Sostenibile – Valutazione Ambientale Strategica dei Piani*, December 2022, https://pums.cittametropolitanaroma.it/sites/default/files/documenti/13_VAS_Rapporto%20Ambientale.pdf.

Cadoneghe, Casalserugo, Legnaro, Limena, Maserà di Padova, Mestrino, Montegrotto Terme, Noventa Padovana, Ponte San Nicolò, Rubano, Saccolongo, Saonara, Selvazzano Dentro, Vigonza, Villafranca Padovana) and the Municipality of Vigonovo, which is part of the Metropolitan City of Venice. Therefore, the interested area is composed of 19 municipalities, hosting the half of the population of the province of Padua, with more than 450.000 inhabitants and an area of more than 380 km².

The Co.Me.Pa. constitutes a permanent body for coordination among municipalities for the development of broad-ranging policies⁹⁷. The municipalities involved commit to carry out actions and initiatives in order to build a common foundation of organizational and functional agreements, particularly in territorial, economic, socio-cultural, administrative and financial policy fields.

The geo-morphologic configuration of the Co.Me.Pa. territory is mainly plain, with an isolated hilly area in the South-West, corresponding to the Euganean Hills.

The territory of the Co.Me.Pa. includes different realities, such as the urban pole of Padua, crucial for the presence of its University, hospital and commercial reasons, other municipalities, relevant for their industrial sites, and those pertaining to the Euganean Hills, important for their touristic activities⁹⁸. The half of the factories of the provincial territory is located in the Municipality of Padua and in the other Municipalities of the Metropolitan Conference. Therefore, these territories benefit from a strategic position at a regional level.

As far as mobility is concerned, a total of 126.553 motor vehicles systematically circulate in the area, with a motorisation index equal to 60,6 cars per 100 inhabitants⁹⁹. According

⁹⁷ "Conferenza metropolitana di Padova - Per sviluppare iniziative concertate in ambito metropolitano", Padovanet – Rete civica del Comune di Padova, last modified September 29, 2015, <https://www.padovanet.it/informazione/conferenza-metropolitana-di-padova>.

⁹⁸ Comune di Padova, *Piano Urbano della Mobilità Sostenibile Conferenza Metropolitana di Padova Co.Me.Pa. – Valutazione Ambientale Strategica*, November 2019, https://www.padovanet.it/sites/default/files/attachment/Rapporto%20Ambientale_VAS_PUMS.pdf.

⁹⁹ "Padova", Osservatorio PUMS – ENDURANCE Italia, accessed August 12, 2023, <https://www.osservatoriopums.it/padova/>.

to the Strategic Environmental Report¹⁰⁰, some of the main issues in the context of mobility are the high traffic flows, especially in the peak hours, which paralyze some road nodes, and the high rate of accidents, particularly in the Municipality of Padua. In addition, noise pollution along the main infrastructures, especially the motorway, represents a major question to be tackled.

The main environmental problems concern air quality and the excess of fine particles, especially linked to road transports and traffic congestion in the metropolitan system, climate, with average seasonal temperatures progressively increasing, and energy consumption, with a majority of fossil fuel-based vehicles in circulation. Moreover soil consumption trends are higher in comparison to the provincial and national average.

The next section provides an analysis of the strategic framework and the main instruments of the SUMP Co.Me.Pa., adopted through the deliberation of the Municipality's council n. 2020/0017 in January 2020¹⁰¹. The aim is assessing whether an eco-social policy integration effort is present in the plan, as prescribed by the European and national guidelines for the preparation and implementation of SUMPs.

3.1.1 The strategic framework of PUMS Co.Me.Pa.

The working group in charge of the SUMP preparation has selected all the strategic lines proposed by the Italian guidelines, including the integration of transport systems, the promotion of collective mobility, the activation of pedestrian and bicycle-based mobility, the incentivisation of sharing mobility, the diffusion of low-emission vehicles, the rationalisation of urban logistics and the promotion of road safety.

Moreover, the strategy aims at selecting instruments based on innovation, electric mobility and price levers. In particular, innovation should include ITS, big data, areas to

¹⁰⁰ Comune di Padova, *Piano Urbano della Mobilità Sostenibile Conferenza Metropolitana di Padova Co.Me.Pa. – Valutazione Ambientale Strategica*, November 2019, https://www.padovanet.it/sites/default/files/attachment/Rapporto%20Ambientale_VAS_PUMS.pdf.

¹⁰¹ Comune di Padova, Deliberazione della Giunta Comunale n. 2020/0017, January 14, 2020, https://www.padovanet.it/materiali-sir-2/PD1_All.3_PUMS_13_Delibera%20G.C.%20n.%202020-0017_signed.pdf.

test new vehicles and technological tools for the integration of mobility services. In this context, the document points out that virtual instruments can improve people's accessibility to information. Therefore, this plan understands accessibility not only as connected to improved accessibility conditions for disadvantaged groups, but also as a universal right to information related to mobility.

In addition, freight transport is considered as a fundamental part of this strategy, describing it through an integrated approach. Since business linked to logistic services is based on a huge competition, the operators tend to diminish the costs of transports. This usually entails the usage of obsolete vehicles and in the maximisation of the number of deliveries without considering the rules of the roads. So, the plan aims at working on the promotion of low-impact vehicles and the respect of rules, including the protection of fair social and economic treatment of employees in this sector.

The participatory approach for the elaboration of the strategic framework of the SUMP and the identification of the objectives, prescribed by the European and Italian guidelines, has been carried out through two tools:

- An online survey, to which approximately 2,500 individuals responded, which identified the needs and priorities of the local community regarding the mobility system;
- Thematic workshops and focus groups involving the local community of Padova and the other Co.Me.Pa. municipalities.

However, the detailed results of the participatory activities are illustrated in the report of the second phase of the SUMP's elaboration, which is not available online. Furthermore, no social networks' profiles, videos or materials are available with respect to the workshops and meetings with the public. Therefore, despite the fact that the identification of the main strategic framework and objectives was based on the participatory activities with stakeholders and citizens, transparency and availability of documents regarding the results of these activities are not ensured by this plan.

The objectives selected by the plan correspond to the mandatory macro-objectives indicated by the Italian guidelines. Moreover, sustainability is presented as the

overarching goal of the plan. The list of objectives, indicators and targets proposed by the working group shows that the plan has a great eco-social integration potential. Indeed, contrarily to a traditional transport planning model, based on the forecasting of future travel demands¹⁰², solely focusing on the goals of traffic management and infrastructure provision, the PUMS Co.Me.Pa. includes a variegated list of objectives which connect different policy dimensions.

However, before outlining some examples of objectives, the approach applied by this plan extensively focuses on environmental issues, while poorly considering social justice problems. This is underlined by the fact that the population of Co.Me.Pa. is not divided into different social groups¹⁰³. For instance, the measurement of improvements of local public transport and other strategic objectives starts from current scenario's data and does not consider people's actual willingness and ability to pay and to act, risking to reflect the current distribution of income in society in the future assets of the mobility system. Therefore, even if the SUMP's transport planning methodology does not reproduce the conventional four-step model, based on data about trip generation, trip distribution, modal split and route assignment¹⁰⁴, it does not include the features of a social justice approach. Rather, it combines some environmental, social and economic objectives, measuring them through single and not-integrated indicators.

In the following table some of the most relevant strategic objectives, indicators and targets of PUMS Co.Me.Pa. are schematised and linked to the policy dimensions they tackle. Indicators and targets are not presented as specific digits and percentages, but they are interpreted and explained. Indeed, presenting the exact targets and indicators of the plan is not the purpose of this research. The aim of this table is showing that a single objective can include different policy dimensions, illustrating the potential eco-social policy integration of each policy aspect. However, it is important to observe that linkages between different policy fields are not highlighted by the plan document.

¹⁰² Varsolo S. et al, "Why does demand-based transport planning persist? Insights from social practice theory", *Journal of Transport Geography* 111 (2023), <https://doi.org/10.1016/j.jtrangeo.2023.103666>.

¹⁰³ Martens, C.J.C.M., "Grounding Transport Planning on Principles of Social Justice", *Berkeley Planning Journal* 19, no. 1 (2006): 1-17, <https://repository.uhn.ru.nl/bitstream/handle/2066/45509/45509.pdf>.

¹⁰⁴ Martens, "Grounding Transport Planning", 5.

Strategic objective	Indicators	Targets	Policy dimensions involved	Why?
Improvement of local public transport	Percentage of total movements (private car, local public transports, walking-cycling)	Decreasing the use of private cars and increasing the use of public transports and active mobility	<ul style="list-style-type: none"> • Environmental • Social • Economic 	<ul style="list-style-type: none"> • The decrease of the circulation of private cars will reduce CO2 emissions • The substitution of private car use with local public transports and active mobility has a positive impact on people's health and on accident risk • Public transports' annual/monthly tickets are less expensive than using private cars on a daily basis
Accessibility of local public transport	Percentage of the population 400 m and 800 m far from bus stops	Increasing the proximity of people to bus stops	<ul style="list-style-type: none"> • Social • Environmental 	<ul style="list-style-type: none"> • Giving the opportunity to access public transports to all improves social justice • It also promotes the use of public transports, rather than the use of private cars, reducing CO2 emissions, air pollution, traffic congestion and accidents
Reduction of traditional fuel consumption	Consumption of fossil fuels per year	30% reduction both in Padova and in the municipalities of the functional urban area	<ul style="list-style-type: none"> • Environmental • Social 	<ul style="list-style-type: none"> • Less fossil fuels means less GHG emissions, air, water and land pollution, habitat destruction and biodiversity loss • This can improve public health

				and liveability of citizens
Reduction of climate-changing gases	Amount of CO2 produced by road traffic per inhabitant	Reduction of 40% both in Padova and in the municipalities of the functional urban area	<ul style="list-style-type: none"> • Environmental • Social 	<ul style="list-style-type: none"> • Reducing CO2 emissions produces a positive impact on climate change and air pollution • This stimulates improvements of public health
Improvement of environmental quality	Amount of pollutant gases (NO2, PM10) per year	Reduction of air pollutants	<ul style="list-style-type: none"> • Environmental • Social 	<ul style="list-style-type: none"> • Reducing NO2 and PM10 produces a positive impact on climate change and air pollution • This stimulates improvements of public health
Reduction of accidents	Accident hazard index and mortality index	Reduction of these indexes	<ul style="list-style-type: none"> • Social • Environmental 	<ul style="list-style-type: none"> • Improved safety and security • Reduction of environmental disasters linked to accidents
Improvement of economic performances of local public transport	Revenues from traffic/operational costs	Increasing revenues	<ul style="list-style-type: none"> • Economic • Social 	<ul style="list-style-type: none"> • Money deriving from this new mobility system can be used to improve the quality of local public transport for the benefit of all citizens
E-mobility	Electric charging stations and percentage of electric and natural gas-based buses	Increasing these types of stations and buses	<ul style="list-style-type: none"> • Environmental • Social 	<ul style="list-style-type: none"> • Electrification of vehicles is seen as a solution to traditional fuel-based vehicles • The reduction of fossil fuels can produce benefits on public health and environment
Local public transport	Percentage of accessible bus and bus stops for disabled people and safe bus stops	Achieving almost 100% of accessible and safe buses and stops	<ul style="list-style-type: none"> • Social • Environmental 	<ul style="list-style-type: none"> • Accessible and safe public transport systems improve social justice and stimulates the

				use of public transports <ul style="list-style-type: none"> • An increased use of public transports reduces the negative impacts produced by personal car use
Cycling	More cycle lanes, bike sharing floating and stations	Increasing cycle lanes, bike sharing floating and stations	<ul style="list-style-type: none"> • Environmental • social 	<ul style="list-style-type: none"> • Active mobility has a positive impact on people's health and reduces the negative impacts produced by the use of motor vehicles

3.1.2 Tools proposed by the PUMS Co.Me.Pa.

As prescribed by the European and Italian guidelines, the plan document includes the presentation of different possible scenarios. The first outlined by the plan is the reference scenario, meaning the set of interventions that would have been realised even in absence of the SUMP, which already approved and disposing of the necessary regional and national funds.

The majority of the activities of the reference scenario can be attributable to a traditional transport planning approach, because they mainly involve infrastructural interventions¹⁰⁵. In the context of the PUMS Co.Me.Pa., they are relevant only for the impact that they can have on the activities proposed in the framework of the plan scenario, such as the redistribution of the traffic flows and the partial solution of congestion problems.

However, there are some interventions in the context of the reference scenario which are particularly relevant for the development of the SUMP, such as the mobility

¹⁰⁵Rupprecht Consult, eds, *Guidelines for Developing and Implementing a Sustainable Urban Mobility Plan*, 2nd Edition, 2019, 10.

management tool known as “MetroMinuto”, the development of the bike lanes in the functional urban area and the strengthening of the urban railway service.

The project “MetroMinuto Padova. La città al passo”¹⁰⁶ is a map that indicates the distances by walk between different places of interest in the urban centre of Padua, such as museums, university sites, schools, offices, services and squares. In addition to this, the map highlights the presence of different bus and tram lines, the railway station, bike and car sharing stations and the parkings surrounding the urban centre of the city. This map can be downloaded from the official website of the Municipality of Padua. Despite not being a project proposed by the PUMS Co.Me.Pa., it is presented as a tool in line with the SUMP because it promotes active mobility, and, indicating parkings surrounding the historical centre, it aims at avoiding congestion in the inner parts of the city. This project follows the example of the Spanish municipality of Pontevedra¹⁰⁷, that first designed this tool in order to promote public health linked to active mobility, security, thanks to the discouragement of private car use, environmental benefits derived from a reduced congestion, such as the decrease of GHG emissions and acoustic pollution, and, more generally, people’s wellbeing, associated with a more active lifestyle. Moreover, Padua’s MetroMinuto map highlights the main historical sites and museums, seeking to promote a sustainable tourism and providing visitors with a useful instrument that can be easily exploited during their visits. This is an example of an information tool related to mobility that integrates the environmental, social and economic benefits.

In addition, the development of the bike paths is part of the reference scenario. In particular, these interventions are organised in the framework of the plan for the inter-municipal land use “PAT/PATI”, which is the master plan of the Metropolitan Community of Padua, and of the programmatic documents of the Co.Me.Pa. administrations. This project involves the construction of 28.770 m of bike paths in many cities of the functional urban area. Moreover, in 2019 the city of Padua started to test a bike sharing

¹⁰⁶ “Progetto “Metrominuto Padova. La città al passo” – Una mappa per incrementare la pedonalità urbana”, Padovanet - Rete civica del Comune di Padova, last modified April 11, 2022, <https://www.padovanet.it/informazione/progetto-metrominuto-padova-la-citt%C3%A0-al-passo>.

¹⁰⁷ Concello de Pontevedra, *Haz tu próprio Metrominuto – Un objeto para impulsar la movilidad a pie*, 2016, <https://360.pontevedra.gal/publicacions/Metrominuto/esp/files/assets/basic-html/index.html#1>.

free floating service, providing 600 bikes (now more than 700) and four collecting points, mainly in the city centre¹⁰⁸. This service is managed by an application for smartphones, that provides information about the location of bikes and the possibility to pay online. As in the case of the MetroMinuto map, this kind of project is perfectly in line with the SUMP logic and has a strong eco-social integration potential. Indeed, although the extension of bike lanes were already put in place outside of the SUMP framework, the Plan Document introduces some additional bike services, coherent with the SUMP. In the context of the PUMS Co.Me.Pa., indeed, the use of bicycles is considered an actual mode of transport for daily movements, rather than a means for leisure activities. By 2025 cycle lanes in the urban areas will be completed, while by 2030 the construction of cycle paths linking the different municipalities of the functional urban area will be achieved. This intervention is in line with the already mentioned BiciMasterPlan¹⁰⁹. In addition to the infrastructural works for the development of the cycle lanes, the Plan proposes the realisation of bike parkings in the new railway stations of San Lazzaro, Campo di Marte and of the Industrial site, and in some of the other municipalities' stations, such as those of Vigodarzere, Colli Euganei Abano Montegrotto Terme and Vigonza, and in the most attractive sites for study, public services, commercial, sport and cultural reasons. Moreover, it suggests the development of bike services, for example public pumps and restoration services, as well as the strengthening of the bike sharing services, both in the urban area of Padua and in some external areas relevant for tourism and university functions. According to the Strategic Environmental Evaluation, interventions for the improvement of bike lanes will bring relevant positive impacts as far as air quality, climate change and energy efficiency are concerned. Moreover, the socio-economic context of the area and public health of citizens will considerably improve, in addition to a substantial reduction of noise pollution.

¹⁰⁸ "Ridemovi: il servizio di bike sharing a flusso libero disponibile in città", Padovanet – Rete civica del Comune di Padova, last modified October 10, 2021, <https://www.padovanet.it/informazione/ridemovi-il-servizio-di-bike-sharing-flusso-libero-disponibile-citt%C3%A0>.

¹⁰⁹ Comune di Padova, B.M.P. Bici Masterplan di Padova 2018 – 2022.

Finally, the strengthening of the urban railway service is a crucial activity for the SUMP scope, even if it occurs in the framework of a service contract stipulated at a regional level. Using the PTV Visum software, the interdisciplinary group has tested and evaluated the possibility of building additional urban railway stations and the increasing the frequency of the railway service. The result of the tests was good, highlighting the shift of about 1% of the overall mobility from the use of personal cars to the use of the railway service. This positive outcome pushed the interdisciplinary working group to insert this intervention into the Plan Scenario.

Specifically, the first intervention presented within the Plan Scenario is the reinforcement of the railway networks' role in the Co.Me.Pa. The main activities in this framework are the following:

- The upgrading of the railway station of Terme Euganee-Abano-Montegrotto by 2025. This intervention aims at developing the integration of local public transports and the railway services and the further introduction of sharing mobility services. In addition, the strengthening of the railway services of the Padova-Montegrotto–Monselice line is aimed at supporting thermal tourism and the access to Euganean Hills. These activities would be fundamental for the touristic features of the area, since Abano Terme and Montegrotto Terme are considered the most important thermal places in the Veneto Region¹¹⁰. Moreover, the Plan proposes to increase the train frequency passing by this station in order to satisfy the commuting demand of citizens. However, since the former intervention is planned by the service contract between Trenitalia and the Veneto region (valid until 2032), an agreement between Co.Me.Pa. Municipalities, Trenitalia and the Region is needed in order to negotiate these new railway services. A deliberation¹¹¹ was achieved on August 6th 2020, for the development

¹¹⁰ "I turisti pernottanti nei comuni più turistici", Sistar – Ufficio di statistica Regione del Veneto, https://statistica.regione.veneto.it/jsp/turismo_focus_altri_comuni.jsp.

¹¹¹ Deliberazione della Giunta Regionale n. 1138, August 6th, 2020, Bur n. 130, August 8th, 2020, <https://bur.regione.veneto.it/BurServices/Pubblica/DettaglioDgr.aspx?id=426154>.

of the railway node of Padova, but it only involved the Municipality of Padua, excluding the other municipalities of the functional urban area.

These proposed interventions have a strong eco-social potential, because they have the goal to promote tourism (economic dimension), satisfy people's commuting needs (social) and foster the shift from the use of private car to the use of trains (environmental);

- The activation of a new railway station for regional trains in the area of Padua San Lazzaro, along the line Padua-Venice. This intervention will be a fundamental service in the framework of the construction of the new hospital centre Padua Est San Lazzaro¹¹² and also for the University functions that will characterise the area.

It is possible to observe that the arrangement of a new station in this part of the city is crucial from a social point of view, because it aims at strengthening the transportation services for public health reasons and also for facilitating the access to this area to students and researchers. In addition, as mentioned before, the development of the railway system has an intrinsic positive environmental impact;

- Reactivation and upgrading of the railway station of Padova-Chiesa Nuova-Campo di Marte, along the Padova-Bologna line. This intervention has the aims of providing a quality service for the West area of the city and link the districts which are separated by the railway. The realisation of the new station has to be carried out in synergy with the construction of the new tram line (SIR 2), that will be described later.

As in the previous cases, this new service will be beneficial from the social point of view, because it will allow the achievement of a better connection between the West part of the city, providing new opportunities for citizens that live and work in this disconnected area;

¹¹² Comune di Padova, Deliberazione della Giunta Comunale n. 2023/0254, May 23rd, 2023, https://www.padovanet.it/urbanistica/Nuovo%20Polo%20della%20Salute%20di%20Padova/dgc_254_2023.pdf.

- Realisation of the new railway station Padova-Area ZIP, that will be a crucial access point to the industrial area of the city. This intervention includes the activation of a shuttle service to reach the different industrial poles.

The objectives behind this activity are the upgrading of the transportation service for employees that work in this district, as well as a better connection with the residential districts of Camin and Granze.

Therefore, once again, this intervention is thought to solve the socio-economic issues linked to a poor transport connection.

The strategic environmental evaluation of the PUMS Co.Me.Pa. analyses the benefits and losses of the main interventions of the Plan as far as environmental, social and economic aspects are concerned. In particular, the report highlights that the strengthening of the railway networks and services will produce relevant positive impacts as far as air quality and energy efficiency are concerned, and a moderate positive impact in the context of climate change. Indeed, the reinforcement of the railway system's competitiveness will contribute to a decrease in the road transport use, which is responsible for a major energy consumption and GHG emissions production with respect to trains. However, this intervention will have a slight negative impact on the soil detriment. Moreover, the landscape of the functional urban area can slightly benefit from the upgrading of existing stations. In parallel, these interventions will moderately enhance the socio-economic situation of the population and its public health because of the decreased congestion, GHG emissions, accident risk, noise and light pollution.

Another package of interventions of the Plan Scenario involves the completion of the main network of the local public transport, which consists of the tram line which covers both the urban area and the other municipalities of the functional urban area, known as SIR (*Sistema Intermedio a Rete*). In addition to the extension of the SIR 1, which already exists, and SIR 3 lines, foreseen by the Reference scenario, and, therefore, disposing of the necessary funds, the PUMS Co.Me.Pa. prescribes the development of the SIR 2 line by 2030. This intervention is co-financed by the Italian National Recovery and Resilience Plan, in the framework of the European NextGenerationEU program, with more than 335

million euro in total¹¹³. The implementation of this service will connect some suburban zones of the Western and Eastern sides of Padova, facilitating the economic activities and functions of the East and connecting some peripheral urban areas, Such as Sarameola and Rubano. Moreover, in the short-medium run, the plan aims at improving the public buses, called “BUS PRIORITY”, especially to serve the roads which will not be covered by the railway system and the tram lines in the short-term. The reinforcement of the public buses will include better environmental standards, accessibility for the population characterised by reduced mobility, the improvement of the security and the quality of bus stops and the electrification of the ticketing system. Therefore, the upgrading of the tram lines and the bus service will have positive economic and social impacts, linking disconnected places to the urban centre of Padua and reinforcing the access to some of the economic nodes of the city, in addition to the environmental benefits derived from the improvement of the public transport system. Indeed, the Strategic Environmental Evaluation considers the reinforcement of the local public transport as highly beneficial in terms of air quality, climate change and energy efficiency. In addition to this, the report highlights that the socio-economic situation and public health of citizens will improve thanks to these interventions.

The SUMP document also plans the development of park and ride areas, aimed at providing spaces where to park in proximity to the current and new railway stations and to the main lines of the tram system. In this way, the SUMP has the goal of guaranteeing the integration between transport modes and avoiding congestion in the urban centre. However, this measure needs to be combined with stringent control measures on car use, otherwise it can produce counterproductive outcomes¹¹⁴. Indeed, the presence of numerous and efficient parking areas can push people to use their own car, instead of opting for public transports for their whole trip, if car use in central areas is not sufficiently restricted. Therefore, despite being a tool associated with the aim of

¹¹³ “Progetto nuova linea tramviaria Vigonza-Rubano (Sir2)”, Padovanet – Rete civica del Comune di Padova, last modified August 29th, 2023, <https://www.padovanet.it/informazione/progetto-nuova-linea-tramviaria-vigonza-rubano-sir2>.

¹¹⁴ Meek, Stuart, “Park and Ride”, in *The Implementation and Effectiveness of Transport Demand Management Measures - An International Perspective*, 165-188, Hampshire: Ashgate, 2008.

reducing car use in the city centre, it is not a guarantee of success alone. In this framework, the creation of an expanded Low Emission Zone will be later analysed, as a favourable tool for the achievement of a reduced car use. The Strategic Environmental Evaluation estimates that park and ride areas will produce relevant positive effects on air quality, climate change and energy efficiency. Moreover, a substantial part of underprivileged population will have the possibility to access public transports, leading to a considerably improved socio-economic situation. Also public health will benefit from park and ride installations, because of the decreasing congestion, GHG emissions and accident risk, linked to an improved modal shift.

The SUMP plans a long list of infrastructural works concerning the upgrading or modifications of the most congested roads. Although these interventions have the objectives of deviating traffic, ensuring an improved security and safety, facilitating the construction of cycle lanes and the circulation of public transports, consistent with the SUMP's logic, they are part of a conventional transport planning method, and, therefore, they will not be analysed. Furthermore, according to the Strategic Environmental Evaluation they will only have a slight positive impact on air quality and climate change and a moderate negative effect on soil detriment. However, major infrastructural works will benefit the socio-economic context because they will foster the speed of freight circulation and increase the accessibility of the most disconnected territories of the functional urban area.

A set of activities is dedicated to the management of the public space and the process of securing and regulating the accesses to the urban centres.

One of the main topics in this framework is the moderation of vehicles' speed in order to ensure an improved security. This activity is presented as in synergy with the Action Plan of the agglomeration of Padua, a strategy aimed at solving noise pollution issues in this territory¹¹⁵. While the PUMS Co.Me.Pa. is mainly managed by the administrative sector of Mobility of the Municipality, this Action Plan's competent authority is the sector of

¹¹⁵ Comune di Padova – Settore Ambiente e Territorio, Piano d'Azione dell'Agglomerato di Padova – Sintesi non Tecnica, January 2019, https://www.padovanet.it/sites/default/files/attachment/IT_a_AP_Agg00026_Summary_Report.pdf.

Environment and Territory, especially the Office for noise, electromagnetic and light pollution. Another policy in synergy with these interventions is the “Bici Masterplan 2018-2022” of Padua¹¹⁶, a strategic plan which has the goal of completing the realisation of the main cycle lanes and improving security and safety conditions of cyclists and pedestrians. Also in this case, the creation of more 30 km/h zones is a central activity, and it is presented as linked to SUMP’s objectives. This plan is managed not only by the administrative Sector of Mobility of the Municipality of Padua, but also by the sector of Local Police, Public Works – Infrastructures – Coordination, Estate and the associations *Legambiente Padova* and *FIAB Padova*. This shows that the scope of the SUMP goes beyond the administrative borders of mobility questions, but needs cooperation between public authorities and also external stakeholders.

The strategic framework of the Plan for noise pollution management underlines that the objectives of the realisation of zones and streets with a limit of 30 km/h are in common with the SUMP project. This measure has the main goal of increasing road safety in the city centre and in the centres of the other municipalities involved. According to the Global Road Safety Partnership¹¹⁷, indeed, pedestrians face an approximately 80% chance of fatality when involved in a collision at a speed of 50 km/h, while the majority of them survive if hit by cars circulating at a speed of 30 km/h. Moreover, the SUMP document specifies that the concept of 30 km/h zone needs to switch towards the concept of “30 km/h city”, in order to further spread the decrease of the speed limit and cities’ overall safety. Specifically, the idea of the implementation of the “30 km/h city” was born after an analysis of the most fragile places in the various cities, such as the most demographic dense areas, the localisation of school and public services and religious areas, the most congested zones and the those characterised by the majority of accidents.

¹¹⁶ Comune di Padova, B.M.P. Bici Masterplan di Padova 2018 – 2022 - Relazione, September 2019, https://www.padovanet.it/sites/default/files/attachment/BMP%202018.2022%20-%20relazione_v02%28firmato%29.pdf.

¹¹⁷ Global Road Safety Partnership, *Speed Management: a road safety manual for decision-makers and practitioners*, 2008, <https://cdn.who.int/media/docs/default-source/documents/health-topics/road-traffic-injuries/speed-management-manual.pdf>.

The reasoning behind this action is multifaceted because it takes into account the benefits of lowering the speed of vehicles at an environmental (less noise and air pollution) and social (improved safety, quality of life of residents and students linked to the possibility to travel by walk and by bike, with a positive impact on health) levels. The reduction of speed limits is combined with the introduction of the Low Emission Zone (LEZ), a revision of the traffic-restricted zones, which plans the modification of the access rules of vehicles based on their characteristics and environmental performance. This intervention is explicitly aimed at reducing environmental impacts, such as air pollution, non-renewable energy consumption, GHG emissions, and social impacts, for example the reduction of noise pollution. In this case, the improvement of environmental and social impacts of traffic are openly stated, showing a clear intention to activate actions that tackle different types of policy problems. According to the Strategic Environmental Evaluation, the reduction of speed limits and LEZ will have relevant beneficial effects as far as air quality, climate change and energy consumption are concerned, and slight positive impacts on natural areas and biodiversity. Moreover, they will bring some benefits with respect to landscape and cultural heritage of the different urban areas. Finally, there will be considerable positive effects on the socio-economic situation of the population, on public health and accident risk.

The introduction of the LEZ is legitimised by the circulation limits imposed by the *Accordo di programma per l'adozione coordinate e congiunta di misure di risanamento per il miglioramento della qualità dell'aria nel Bacino Padano*¹¹⁸, a programmatic agreement between the Italian regions which are part of the Po basin. This agreement, was born after two infringement procedures initiated by the European Commission against Italy because of the incorrect application of the Directive 2008/50/CE¹¹⁹, in particular due to the continuous excesses of the limits of the particulate PM10 in the Italian territory.

¹¹⁸ Regione del Veneto, Deliberazione della Giunta Regionale n. 836 - Approvazione del "nuovo Accordo di programma per l'adozione coordinata e congiunta di misure di risanamento per il miglioramento della qualità dell'aria nel Bacino Padano", June 6th, 2017, <https://bur.regione.veneto.it/BurvServices/pubblica/DettaglioDgr.aspx?id=347278>.

¹¹⁹ Directive 2008/50/EC of the European Parliament and the Council on ambient air quality and cleaner air for Europe, May 21st, 2008, <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32008L0050>.

Among other measures, the programmatic agreement prescribed the limitation of the circulation of vehicles with low environmental performances in some hours of the day, according to a scale of alert levels, depending on the excess of the limits of the concentration of PM10 (e.g. the impossibility to circulate for vehicles below Euro 4 diesel class in urban areas from 8.30 a.m. to 6.30 p.m.). The limitations to circulate are mandatory by law, in application of the Package of extraordinary measures approved by the Veneto Region¹²⁰, after the conviction issued by the Court of Justice of the European Union on November 10th 2020¹²¹, where the Court declared the failure of Italy to ensure compliance with the limits of PM10 in certain agglomerations.

The LEZ needs to be combined with the presence of concrete mobility alternatives in order to guarantee the access to urban areas, such as the strengthening of the public transport system, interchange parkings for the modal shift, or the extension of the bike lanes. Therefore, the LEZ would make the limitations prescribed by the programmatic agreement permanent, independently of the concentrations of PM10. The SUMP document, indeed, proposes to permanently block the access to urban areas for the most polluting vehicles from 2023.

Moreover, the document introduces the concept of Ultra Low Emission Zone (ULEZ), which is not mandatory by law yet, but would be a useful tool in the most urbanised areas, where significant negative impacts of polluting substances on human health occur. This shows that the SUMP recognises the link between air pollution, GHG emissions and public health, even if in a marginal way.

A package of soft measures in support of active mobility promoted by the SUMP includes communication and safety education activities. In this context, the positive impacts of active mobility (walking and cycling) on the reduction of coronary diseases, strokes,

¹²⁰ Regione del Veneto, Deliberazione della Giunta Regionale n. 238/2021 - Pacchetto di misure straordinarie per la qualità dell'aria in esecuzione della sentenza del 10 novembre 2020 della Corte di Giustizia europea, March 2nd, 2021, <https://bur.regione.veneto.it/BurvServices/pubblica/DettaglioDgr.aspx?id=442838>.

¹²¹ Judgement of 10 November 2020, European Commission v Italian Republic, C-644/18, EU:C:2020:895, paragraph 1, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A62018CJ0644>.

diabetes, hypertension, colon and breast cancer, and hypertension are highlighted¹²². Moreover, physical activity is presented as fundamental for the energy balance and weight control of people. Indeed, urban and environmental policies are considered by the SUMP as crucial in order to increase the levels of physical activity of individuals. These statements are a clear representation of an integrated measure aimed at combining environmental benefits with positive social impacts. Indeed, the Strategic Environmental Evaluation highlights that educational actions that will foster the use of bicycles and walking will have relevant positive impacts on air quality, climate change and energy efficiency, as well as on public health and on the socio-economic situation of the functional urban area. In this context, the Plan aims at working hard for the promotion of road education in schools of the functional urban areas, assisting teachers with targeted projects. Furthermore, the plan introduces the topic of safety linked to the diffusion of cycling practices. Indeed, the case of Netherlands is cited, where bike accidents have exceeded those caused by cars. Therefore, the importance of information campaigns, education and an integrated work with the different sectors of public administrations and education entities is called for by the Plan Document.

A package of actions concerns the policies for the demand for mobility management. In this context, the main objective is decreasing car dependency and fostering a demand for the means of transport that produce low environmental, social and economic impacts. In order to achieve this, the working group proposes a mix of tools, including the development of park and ride structures, especially in the external parts of the urban centres, as already explained before, a set of pricing and control measures linked to the use of personal cars, the development of sharing mobility and mobility management.

Specifically, the SUMP aims at increasing the perceived cost linked to car use by 50% by 2025 and by 100% by 2030. Park and road pricing, indeed, will contribute to a decreased car use and, as a consequence, to a reduction of GHG emissions and air pollution. For instance, the hour tariff of urban parkings would have a double cost with respect to the most external areas, and smart parking systems would be used in order to control and

¹²² “WHO launches Global Action Plan on Physical Activity”, World Health Organization, June 4th, 2018, <https://www.who.int/news/item/04-06-2018-who-launches-global-action-plan-on-physical-activity>.

sanction irregular behaviours. In addition, a pass that costs money would be given to resident family units, and would be more advantageous for families which own just one car. Moreover, the exploitation of ITS instruments is presented as fundamental in order to provide information on the parking areas external to the city centres, smart payment tools for parkings and the management of resident family passes.

Sharing mobility can be extremely useful in the urban area of the Municipality of Padua because of the presence of thousands of students, tourists and public services. However, the propensity to use sharing services is low in the other municipalities of the functional urban area, as underlined by the online survey launched by the working group in the preliminary phases of the SUMP's preparation. This low propensity, together with the unpredictability of the future conditions linked to the new tools of micro-mobility (scooters, segways, hoverboards, etc.), constitute the main issues in the framework of sharing mobility in the Co.Me.Pa. area. Nevertheless, sharing mobility can foster the circulation of cleaner electricity-based vehicles, and, providing targeted services for the disabled and old parts of the population, can contribute to an improved attention to marginalised groups. Indeed, according to the Strategic Environmental Evaluation, thanks to the reinforcement of sharing mobility, air quality, climate change and energy efficiency will improve considerably. At the same time, moderate benefits to the socio-economic context and public health will occur as a result of the further diffusion of a sharing transport services, decreasing congestion, GHG emissions, accident risk and noise pollution. This, will also favour and accelerate the transfer of goods and enhance the accessibility level of territories of the area.

“Decreto Ronchi”¹²³, an Italian decree of March 27th 1998, for the promotion of sustainable mobility in the urban areas, institutionalised the company mobility manager and the area mobility manager. These figures have the task of creating the plans for the movements from home to the workplace and proposing concrete sustainable mobility actions through the promotion of public transports, bicycles, sharing and electric mobility. The SUMP aims at contributing to the efforts of development of these figures,

¹²³ Ministero dell'Ambiente, Decreto 27 marzo 1998 – Mobilità sostenibile nelle aree urbane, <https://www.gazzettaufficiale.it/eli/id/1998/08/03/098A6963/sg>.

with a special focus on movements for study purposes, in order to support security, safety, accessibility and the availability of night buses for students and youngsters. The school mobility manager, is a figure regulated by law n° 221 of December 28th 2015¹²⁴, and the SUMP has the goal of further strengthening its work towards more sustainable and green practices. In this framework, the Strategic Environmental Evaluation highlights slight benefits with respect to air pollution, climate change and energy efficiency, as well as to public health, and the socio-economic context. The level of positive impacts is considered slight probably due to the incentivisation character of the mobility management actions, which is not comparable to the concrete construction of bike lanes or the establishment of a Low Emission Zone. However, these “soft” interventions are important contributions to the achievement of the goals of the SUMP, especially because they do not restrict users’ behaviour, paving the way for a major public support.

As far as logistics is concerned, the Plan underlines that freight and commercial transports are also subject to the rules of the LEZ, as well as the planned ULEZ. With the incremental implementation of these zones, the freight mobility will have to be electricity-based, also exploiting cargo bikes and progressively avoiding the employment of endothermic vehicles.

Similarly to the experience of City Porto¹²⁵, a service of low-emissions urban freight distribution, managed through a programmatic agreement between local public entities, the SUMP pushes towards a new voluntary agreement between freight operators and the local administrations. This agreement should aim at promoting the use of low or zero impact, reduced-sized vehicles, with traceability systems, through incentives concerning access times, reduced tariffs, the installation of specific parking areas. Limitations and disincentives, however, should not promote lower working conditions and salaries. These recommendations show that environmentally-friendly measures promoted by the Plan are presented in connection with possible negative social impacts, with a clear

¹²⁴ Il Presidente della Repubblica, Legge 28 dicembre 2015, n. 221 - Disposizioni in materia ambientale per promuovere misure di green economy e per il contenimento dell'uso eccessivo di risorse naturali, <https://www.gazzettaufficiale.it/eli/id/2016/1/18/16G00006/sg>.

¹²⁵ “Cityporto Padova – Urban green deliveries”, Interporto Padova S.p.a., accessed August 23, 2023, <https://www.interportopd.it/cityporto/>.

intention to limit them as much as possible. However, in addition to significant air quality, climate change and energy efficiency improvements, the Strategic Environmental Evaluation foresees considerable socio-economic and public health benefits.

Moreover, the promotion of electric mobility and correlated services is an asset of the Plan. Both in the short and in the long run, the Plan prescribes the launch of incentives for the substitution of standard vehicles with electric vehicles of public entities and services, such as schools, municipalities, public health institutions, school canteens and freight systems, as well as the construction of electric charging infrastructures in private companies, interchange parkings, and other attractive areas. In addition, the elaboration of a new law relative to the construction sector will be elaborated in order to guarantee the establishment of charging infrastructures in residential buildings. According to the Strategic Environmental Evaluation, this measure is correlated with considerable environmental improvements, but with moderate public health benefits and slight socio-economic impacts. This can be explained by a shift towards the new e-mobility market, with possible negative effects on the traditional automotive sector, mainly based on fossil fuels.

Finally, the plan promotes the introduction of a test area for innovative self-driving vehicles, as well as the experimentation of integrated tools of Mobility as a Service. This means creating a technological application that combine all the different available modes of transport of the municipalities of the functional urban area. The complexity of this kind of service requires an incremental feasibility project, especially in light of the new instruments and infrastructures that will be available in the long-run thanks to the SUMP indications. The Strategic Environmental Evaluation, indeed, foresees slight benefits as far as air quality, climate change, energy consumption, socio-economy and public health are concerned. This is due to the uncertain effects of these types of new vehicles, that need further tests and evaluations.

3.2 Rome's case study: "PUMS Città Metropolitana di Roma Capitale"

The Metropolitan City of Rome Capital, composed of 121 municipalities, is the most populous among the Italian metropolitan cities and is the second-largest in terms of territory, after Turin¹²⁶. Indeed, The territory of the Metropolitan City of Roma Capitale covers an area of over 5.000 km², within which a population of approximately 4.200.000 inhabitants resides. The average population density is around 790 inhabitants per km²
127.

The orographic conformation of this area is mainly hilly, with the Capital and other 5 municipalities located in the plain, 77 municipalities in the hills, while the remaining 38 municipalities in the mountains. The Capital is the most attractive city in terms of jobs, hosting about 80% of workers of the residents of the entire metropolitan area. As a matter of fact, the metropolitan area has a monocentric structure, which surrounds the Capital's urban centre, fostering a process of progressive creation of suburbs, limiting the homogeneous distribution of economic opportunities and competitiveness of the other territories and hindering their citizens' quality of life.

As far as mobility is concerned, 3.536.082 vehicles systematically travel in the metropolitan area, with about 95% of the total daily movements towards the internal part of the Capital, and 66,8% of residents' movements by private vehicles¹²⁸. Indeed, the use of personal cars is considered the main source of environmental and social problems in the metropolitan area. Some of the main environmental issues are the excesses of NO₂, especially in the Municipalities of Rome and Fiumicino, those of PM₁₀ in the entire metropolitan area, and CO₂ emissions, with Rome being responsible of

¹²⁶ "Carta d'Identità", Città Metropolitana di Roma Capitale, accessed August 22, 2023, <https://www.cittametropolitanaroma.it/homepage/la-citta-metropolitana/la-pianificazione-strategica/carta-didentita/>.

¹²⁷ Città Metropolitana di Roma Capitale, *Piano Urbano della Mobilità Sostenibile - volume 1 - Il Quadro Conoscitivo*, December 2022, https://pums.cittametropolitanaroma.it/sites/default/files/documenti/PUMS%20Volume%201_1.pdf.

¹²⁸ "Carta d'Identità", Città Metropolitana di Roma Capitale, accessed August 22, 2023, <https://www.cittametropolitanaroma.it/homepage/la-citta-metropolitana/la-pianificazione-strategica/carta-didentita/>.

more than 70% of total CO2 emissions in the Lazio Region¹²⁹. Noise pollution deriving from car circulation is another major issue. From the social point of view, a relevant data is the presence of 20.497 persons with disabilities in the metropolitan area.

In the following sections, the analysis of the strategic framework and of some of the most relevant actions of the SUMP of the Metropolitan City of Rome is provided. The plan was adopted with the Mayor's administrative order, n. 220, in December 2022¹³⁰.

3.2.1 The strategic framework of PUMS Città Metropolitana di Roma Capitale

The SUMP of Rome is developed in such a way as to meet the mobility needs of the entire metropolitan area, pursuing the goal of improving its liveability through a sustainable and inclusive transportation system. This system should ensure accessibility to public and work services for all, enhancing the safety of people and goods, reducing pollution and greenhouse gas emissions, contributing to energy conservation, increasing the efficiency and cost-effectiveness of passenger and freight transportation, in order to enhance the attractiveness and quality of the metropolitan area. Therefore, the Plan Document highlights a clear eco-social integration intention.

The main result that the SUMP pursues is a considerable reduction of private transports use, and a shift towards non-polluting modes of transports, through an increasing availability of public transports. Indeed, the main actions proposed by the SUMP are focused on the establishment of the Metropolitan Railway Service (SFM) and a Mass Rapid Transit network, capable of serving the dual role of an urban and metropolitan system. As a matter of fact, according to the Italian SUMPs' Observatory¹³¹, the most

¹²⁹ Città Metropolitana di Roma Capitale, *Piano Urbano della Mobilità Sostenibile – Valutazione Ambientale Strategica dei Piani*, December 2022, https://pums.cittametropolitanaroma.it/sites/default/files/documenti/13_VAS_Rapporto%20Ambientale.pdf.

¹³⁰ Città Metropolitana di Roma Capitale, Decreto n. 220, December 12, 2022 - Adozione del Piano Urbano della Mobilità Sostenibile (PUMS) della Città metropolitana di Roma Capitale, <https://static.cittametropolitanaroma.it/uploads/decreto-sindaco-citt%C3%A0-metropolitana-di-Roma-Capitale.pdf>.

¹³¹ "Roma", Osservatorio PUMS – ENDURANCE Italia, accessed August 20, 2023, <https://www.osservatoriopums.it/roma/>.

worrying issue in the context of the Capital is the high level of motorisation, equal to 840 vehicles per 1000 inhabitants, due to the presence of about 500.000 motor vehicles, high levels of commuting, and the limited development and use of sustainable modes of transportation (public transport, cycling, walking).

The Plan Document and the official website of the SUMP¹³² highlight that the involvement of local communities and the main stakeholders was fundamental for the definition of the strategic framework and the concrete instruments of the SUMP, as prescribed by the preliminary activities of the Italian guidelines and by different sections of the Eltis guidelines, illustrated in the previous chapter. The participatory path of Rome's SUMP followed three main approaches:

- Information and education, in order to build a common language to be used throughout all phases of the work, conveying the concepts of objectives, strategies, and actions, as well as the metropolitan significance of PUMS actions, through meetings and training workshops;
- Listening sessions, aimed at capturing the strengths and weaknesses, opportunities and threats related to mobility in the metropolitan area, both by thematic area and by territorial area, with the support of the technical working group for translating the needs and developing specific objectives for the metropolitan territory;
- Updating sessions, aimed at informing people about novelties and integrating the list of minimum ministerial objectives and their priorities in light of the contextual changes and new needs of the territory.

In addition, the official website has made the participatory phases' reports available for the public, promoting also the consultation of the Plan's social networks on Facebook, Twitter, LinkedIn and Youtube, in order to establish a direct contact with users and share the updates on the Plan's implementation with citizens. Specifically, in the dedicated

¹³² "Partecipazione", PUMS Città Metropolitana di Roma Capitale, accessed August 23, 2023, <https://pums.cittametropolitanaroma.it/partecipazione>.

Youtube channel¹³³, it is possible to watch the recordings of the public meetings and workshops related to the participative elaboration of the Plan. Therefore, differently from the case of PUMS Co.Me.Pa., a transparent and open participatory approach, called for by the European and Italian guidelines, is reflected not only by the activation of dedicated participatory meetings, but also by the public availability of documents, videos and social networks' profiles.

The participatory activities led to the identification of five general objectives, namely accessibility, efficiency, development, liveability and security.

To each of these five categories correspond the 17 mandatory macro-objectives imposed by the Italian guidelines for the preparation of SUMP. Moreover, other 7 macro-objectives have been identified by the interdisciplinary working group and the local communities, additional to the compulsory ones. Following the practice carried out in the previous section, relative to the most important objectives of the SUMP Co.Me.Pa., a scheme of the additional objectives with their corresponding indicators and their inherent eco-social characteristics is provided:

Strategic objective	Indicators	Policy dimensions involved	Why?
Improvement of active mobility's attractiveness	Increase of the use of bicycle for habitual movements; incentives for the purchase of bikes, e-bikes, electric tools or micromobility devices; number of high schools and universities linked by bike lanes; number of elementary and middle schools disposing of walking and bike buses	<ul style="list-style-type: none"> • Environmental • Social 	<ul style="list-style-type: none"> • Active mobility has a positive impact on environment (reduction of car use, GHG emissions, traffic congestion and car accidents) and, consequently, on people's health
Improvement of sharing	Length of travels by sharing vehicles;	<ul style="list-style-type: none"> • Environmental • Social 	<ul style="list-style-type: none"> • Sharing mobility can contribute to a reduced

¹³³ PUMS Città Metropolitana di Roma Capitale, "Dritti Agli Obiettivi! - Definiamo insieme le priorità del PUMS metropolitano", YouTube video, March 31, 2022, <https://www.youtube.com/watch?v=VNk85gS5xwc>.

<p>mobility's attractiveness</p>	<p>number of sharing vehicles per resident population; territorial presence of sharing services; number of parkings dedicated to sharing vehicles; total movements by sharing vehicles; incentives to access pool vehicles</p>	<ul style="list-style-type: none"> • Economic 	<p>traffic congestion, leading to the decrease of GHG emissions, air and noise pollution and car accidents</p> <ul style="list-style-type: none"> • This can contribute to a better public health and better movement opportunities for disadvantaged social groups that cannot afford a personal car • Sharing mobility can be a good cost-saving option in comparison to the costs related to owning a personal vehicle. It can also be an attractive measure for touristic purposes
<p>Improvement of the intermodality with the local public transport</p>	<p>Level of time coordination between different local public transports and railway services; number of bus stops at a distance of maximum 100 m from the railway stations; total population living 15 minutes away from railway stations (by any kind of local public transport); percentage of local public transport stations with bike parkings; percentage of local public transport stations linked by bike lanes</p>	<ul style="list-style-type: none"> • Environmental • Social • Economic 	<ul style="list-style-type: none"> • The improve of public transports' intermodality can lead to the decrease of the circulation of private cars, reducing CO2 emissions, air pollution, traffic congestion and car accidents • This can contribute to the improvement of public health and an increasing availability of transport options for users • Public transports' annual/monthly tickets and bikes are less expensive than using private cars on a daily basis
<p>Development of smart mobility</p>	<p>Number of electronic information signs present in public transports' stops; number of public transport systems disposing of an integrated fare; number of variable message signs in the main roads</p>	<ul style="list-style-type: none"> • Environmental • Social 	<ul style="list-style-type: none"> • The development of technological systems, such as e-tickets with integrated tariffs, can progressively replace paper tickets, reducing paper and plastic waste • Electronic signs can give real-time updates to users, with consequent improved service's efficiency and users' satisfaction

Increase of the widespread sustainability	Number of municipalities disposing of mobility or traffic plans; percentage of travels' duration equal to or below 20 minutes	<ul style="list-style-type: none"> • Environmental • Social • Economic 	<ul style="list-style-type: none"> • Widespread sustainable plans and measures aim at producing environmental benefits, considering and tackling possible social issues, and creating new economic opportunities, for example related to the smart mobility sector
Development of slow tourism	Amount of walking, cycling and bridle paths; increase of accommodation facilities dedicated to slow tourism	<ul style="list-style-type: none"> • Environmental • Social • Economic 	<ul style="list-style-type: none"> • Promoting active mobility at a touristic level can reduce motor vehicle use, with positive impacts on air quality, noise pollution and traffic congestion • This can bring public health benefits to the local population, and an improved liveability • Slow tourism represents an attractive alternative that can bring revenues to public and private local companies
Improvement of bikes' security	Number of bike parkings	<ul style="list-style-type: none"> • Social • Environmental 	<ul style="list-style-type: none"> • An increasing number of bike parkings promotes security, for example, with respect to thefts, fostering the use of bicycles and active mobility in general • Actions supporting active mobility contribute to a better population's health

Unpacking some Plan's objectives shows the possible policy dimensions involved, which can be considered when designing integrated instruments to achieve them.

Moreover, the document underlines the direct link between its objectives and five of the UN's Sustainable Development Goals, in particular:

- Good health and well-being;
- Reduced inequalities;
- Sustainable cities and communities;
- Decent work and economic growth;

- Climate action.

These highlighted connections reveal the SUMP's clear intention to establish a synergy between the local sustainable mobility Plan of Rome and the international context, in line with the recommendations of the second step of the European guidelines for the preparation of a SUMP.

According to the Plan Document, the step following the definition of objectives is the construction of strategies that include the concrete tools and interventions that are necessary to achieve the identified goals. Specifically, this SUMP develops 33 strategies divided into three paradigms:

- Avoid: involves all policies aimed at reducing travels by personal vehicles, and an increasing the use of local public transports;
- Shift: includes all policies aimed at modifying users' behaviour towards sustainable means of transports;
- Improve: encompasses all policies which promote and incentivise technological development and the renewal of transports in circulation.

3.2.2 Tools proposed by the PUMS Città Metropolitana di Roma Capitale

The Plan Document proposes a total of 106 actions, divided by strategy and their contribution to one or more of the general objectives. It is possible to distinguish two major categories of actions, namely "management-related" and "infrastructure-related." The former do not involve the creation of new infrastructures or facilities, but they rather focus on improving the regulation of existing infrastructure, enhancing services, and implementing specific policies aimed at improving the mobility sector from a sustainability perspective and encouraging virtuous behaviours. By contrast, the "infrastructure-related" interventions are attributable to a traditional transport planning approach, and are related with specific concrete actions to be realised in the medium and long-run. Moreover, a part of activities proposed by the SUMP are grouped into four sub-plans:

- Public transports' plan of the metropolitan basin (PdB);
- Metropolitan Bicycle Mobility Plan (Biciplan);
- Freight and Sustainable Logistics Plan (PMLS);
- Mobility Plan for People with Disabilities (PMPD).

However, in this section, actions are not presented according to their affinity with one or more plans, but they are classified based on whether they are “infrastructural-related” or “management-related”.

The infrastructural-related actions, despite being attributable to a traditional transport planning method because they focus on traffic management and infrastructure construction, are relevant in terms of eco-social policy integration. Some examples are provided in order to show how the interdisciplinary working group in charge of the SUMP's preparation has brought to light the linkages between different policy dimensions.

In the context of the general objectives of accessibility, efficiency and liveability, strategy 1 aims at increasing the infrastructural supply for the local public transport. The set of actions proposed within this strategy has been included into the Plan Scenario even if they are part of the Framework agreement between Rete Ferroviaria Italiana (RFI) and the Lazio Region¹³⁴. Specifically, the SUMP considers the national and regional railway network as the main system to be developed, in synergy with the infrastructural networks of the local metro and tram. In particular, the action regarding the development of the railway system plans the construction of new stations and the expansion of the rails of the functional urban area. An example is the construction of the Massimina station, that will be located in a zone lacking railway services, in order to overcome congestion issues that causes a series of inconveniences to the local population. In parallel, the development of the infrastructural network of the metro system, including the construction of new stops, branches, lines and the upgrading of the existing ones, will benefit both the urban and extra-urban areas. Indeed, the Plan

¹³⁴ Città metropolitana di Roma Capitale, *Piano Urbano della Mobilità Sostenibile - volume 2 - Costruzione partecipata dello Scenario di Piano*, December 2022, <https://pums.cittametropolitanaroma.it/sites/default/files/documenti/PUMS%20Volume%202.pdf>.

Document underlines that these interventions will link important social places which are currently disconnected from the mobility system. Moreover, they will foster the reduction of congestion, increasing the speed of the road public transports, improving, at the same time, citizens' liveability. Together with these actions, the document plans 27 interventions for the development of the tram networks.

The Plan Document highlights that the combination of these infrastructural works will increase users' satisfaction, social connection of the urban territory, environmental sustainability of mobility, while decreasing people's expenses linked to the use of personal cars.

Other infrastructural interventions concern the improvement of accessibility of the railway stations. This action has the objective of enhancing the efficiency of local public transports in order to promote its accessibility and use, while stimulating the decrease of GHG emissions and other negative externalities of traffic, such as noise pollution and accidents. Moreover, the Plan, through these infrastructural interventions, has a clear intention to guarantee equal access to means of transport, in line with the UN Convention on the Rights of Persons with Disabilities¹³⁵. Although this action has a well-defined social value, the specific interventions proposed in this context are only three. In particular, two of them aim at pursuing the technological development of the interchange nodes of the stations Tuscolana and Nomentana, while the last has to do with the improvement of accessibility of the railway station of Cecchina.

A softer intervention proposed by the Plan is the extension of the preferential lanes dedicated to public means of transport concerning six corridors of the city, with the goal of reducing congestion and improving users' perception of the service.

According to the Environmental Report¹³⁶, the actions included in strategy 1 will improve air quality, energy efficiency, security, social equity, information and participation, while

¹³⁵ United Nations – Department of Economic and Social Affairs, *Convention on the Rights of Persons with Disabilities*, May 03, 2008, <https://www.un.org/development/desa/disabilities/convention-on-the-rights-of-persons-with-disabilities/convention-on-the-rights-of-persons-with-disabilities-2.html>.

¹³⁶ Città Metropolitana di Roma Capitale, *Piano Urbano della Mobilità Sostenibile – Valutazione Ambientale Strategica dei Piani*, December 2022,

reducing noise pollution and public health issues. Therefore, despite being traditional infrastructural interventions, they have the potential to tackle environmental and social problems simultaneously.

Another set of actions which are particularly important for the characteristics of the Metropolitan City of Rome are contained in strategy 33, aimed at increasing accessibility to goods and services in the weakest areas from the economic and social points of view. Indeed, the Plan Document highlights that the functional urban area is characterised by a high rate of inhabitants who live in weak zones. The disconnection of these areas from the urban centre prevents them to access basic services, reducing the local population's wellbeing and limiting individuals' choices and possibilities. Moreover, the document points out that the territorial capital of those areas is underutilized. Therefore, the strategy has the goal of unlocking those territories' natural, cultural and cognitive capital, as well as the social energy of the interested population. In order to achieve this goal, strategy 33 proposes a package of infrastructural measures based on the development of bike lanes. According to ISTAT, indeed, in 2020 Rome was one of the Italian metropolitan cities with the most underdeveloped bike lanes, with only 25 km of bike paths per 100 km²¹³⁷. Therefore, in addition to promoting the connection between weak areas and urban centres, the development of bike lanes will produce positive environmental impacts and reduce the costs related to the use of personal cars. Indeed, the from the Environmental Report emerges that this strategy will affect air quality, energy efficiency and noise pollution positively, while improving security, social equity, information and participation, public health and urban environment's quality.

The Plan proposes a huge package of "management-related" actions. Therefore, only those that can be comparable to the measures proposed by the PUMS Co.Me.Pa and some tools that can be beneficial in terms of eco-social policy integration are analysed.

https://pums.cittametropolitanaroma.it/sites/default/files/documenti/13_VAS_Rapporto%20Ambientale.pdf.

¹³⁷ ISTAT, *Report Ambiente Urbano Anno 2020*, July 2022, <https://www.istat.it/it/files/2022/07/REPORT-AMBIENTE-URBANO-2021.pdf>.

Similarly to PUMS Co.Me.Pa, strategy 10 of the plan aims at incentivising the use of free flow and station-based sharing services. In particular, the metropolitan area will have to activate car sharing services in municipalities with more than 50.000 inhabitants, and two-wheeled sharing vehicles in municipalities with more than 30.000 inhabitants. A novelty of this measure, with respect to the case of Padua, is the attention given to security as a fundamental characteristic for the enhancement of the access and the use of sharing services by people. Indeed, among the measures proposed in this context, there is the idea of installing video-surveillance cameras in car sharing parkings. According to the Environmental Report, this measure will improve air quality, energy efficiency, security, social equity, information, participation and public health. Indeed, as already analysed, the development of sharing mobility can reduce the use of personal cars, decreasing traffic congestion, GHG emissions, accidents, improving people's health and security. This environmental report, however, with respect to that of Padua, underlines additional social benefits, for example an improved social equity, in light of the presence of social groups who cannot afford the purchase and maintenance of a private vehicle.

Strategy 11 of the Plan has the goal of incentivising the development of a "Mobility as a Service (MaaS)" platform. In this context, the SUMP aims at providing support the Municipality in the development of the pilot project "MyCorridor"¹³⁸, funded by the Horizon 2020 program, where the Municipality of Roma Capitale is partner. Differently from Padua, Rome was identified at a national level, together with Milan and Naples, as a technological advanced pilot city. Therefore, the role of the Municipality in the development of such a service is fundamental on a national scale. The foreseen beneficiaries linked to this action are citizens, who will dispose of a platform facilitating sustainable and intermodal travel options; economic operators of MaaS, transports and mobility; public administrations, that will be supported by those tools for the governance of mobility policies of their territories. The Environmental Report suggests that this new instrument will contribute to the improvement of air quality, energy efficiency, security and social equity, information and participation and public health. Indeed, a better

¹³⁸ "Rome Pilot", My Corridor, accessed August 23, 2023, <http://www.mycorridor.eu/pilots/rome-pilot/>.

integration between modes of transport, with the support of a technological platform, can reduce the use of personal cars, decreasing traffic congestion, GHG emissions, accidents, improving people's health and security.

In the strategy dedicated to the promotion of the Mobility Management, through the Mobility Manager's actions, some novelties, with respect to the PUMS Co.Me.Pa, are the incentivisation of smart working, and the regularisation of this practice in public entities, as a way to avoid traffic congestion. Indeed, smart working would reduce people's travels, especially during peak hours. As stressed several times in this text, the reduction of congestion entails intrinsic environmental, social and economic benefits. As a matter of fact, the Environmental Report underlines that this strategy will promote air quality, energy efficiency, security, social equity and urban environment's quality, while reducing noise pollution and the impact on public health.

A new concept, in comparison to the PUMS Co.Me.Pa., is the introduction of the 15-minute city. The SUMP document points out that this kind of city should be contemporary, polycentric, accessible, sustainable, and should stimulate people's participation and inclusion through the reduction of distances between the urban centre and suburbs. This strategy is clearly intended to increase the metropolitan area of Rome's liveability and citizens' quality of life.

Among the seven actions proposed in this framework, the realisation of traffic-restricted zones in the municipalities of the functional urban area with more than 30.000 inhabitants is put forward. In particular, differently from the concept of the Low Emission Zone introduced by the PUMS Co.Me.Pa., in this case, the restriction of traffic is not permanent, but concerns specific time frames or days. Probably, this difference has to do with the fundamental services that the Capital city provides at a regional level and with the consequent inconveniences that a Low Emission Zon could create. For instance, movements for working or study reasons inside the city correspond respectively to 94% and 99%, while just 6% and 1% of inhabitants systematically go outside of the city centre

to reach their workplaces or university¹³⁹. Therefore, a high concentration of people circulates in the internal part of the city, rather than towards the external areas. According to the Plan Document, the establishment of the traffic-restricted area, in order to be functional for the creation of the 15-minute city, needs to be coordinated with the strengthening of the local public transports. In this way, the plan aims at linking different social spaces, placing inclusiveness and community values at the core of a new environmentally sustainable city vision.

In addition, the congestion charge is another intervention proposed for the realisation of the 15-minute city. This pricing system concerns restricted areas and has the main effects of discouraging the use of personal cars, reducing congestion, stimulating investments in the public transport system and redeveloping urban spaces and green areas. This, according to the SUMP Plan, would diminish air and noise pollution levels, while improving people's quality of life.

Together with traffic-restricted areas and the congestion charge, which would be useful to pave the way for more environmentally and socially sustainable cities, the SUMP aims at developing pilot projects for neighbourhood services. This proposal has the intention to make all possible services available in every community, in order to stimulate cooperation and social benefits among citizens and positive environmental effects due to the decrease of long-distance travels for accessing services. A program called "*15 Municipi 15 Progetti per la città in 15 minuti*"¹⁴⁰ has been developing in Rome. A masterplan containing the features of the 15-minute city has been preparing, with the aim of upgrading the urban spaces of the territories involved.

According to the Environmental Report of the SUMP, the strategy for the promotion of the 15-minute city with the interventions aforementioned and others, will have positive impacts on air quality, energy efficiency and noise pollution, while increasing social

¹³⁹ "Roma", Osservatorio PUMS – ENDURANCE Italia, accessed August 20, 2023, <https://www.osservatoriopums.it/roma/>.

¹⁴⁰ "Programma di rigenerazione urbana "15 Municipi, 15 progetti per la città in 15 minuti", Roma Capitale, last modified September 22, 2022, <https://www.comune.roma.it/web/it/notizia.page?contentId=NWS962640>.

security, social equity, information, participation, public health levels, and urban environment's quality.

Strategy 5 of the SUMP of the Metropolitan City of Rome needs particular attention. Indeed, it deals with the discouragement of the use of private motor vehicles, since the main issue concerning the functional urban area is the presence of over 750 private vehicles per 1.000 inhabitants. In order to reduce the use of private cars, the SUMP launches nine actions, also involving the realisation of traffic-restricted zones and the congestion charge analysed above. The actions that represent a turning point with respect to the PUMS Co.Me.Pa are the introduction of walking buses and bike buses for children of elementary and middle schools. Indeed, while the SUMP of Padua just mentions the possibility of the introduction of bike buses, which can be coordinated by parents on a voluntary basis, the SUMP of the Metropolitan City of Rome envisages it as a flagship initiative for the provision of a new road education for children. Indeed, the practices of walking and bike buses are not only presented as actions aimed at reducing congestion and improving the related environmental issues, but also as a tool for the education of future citizens, who will develop a sustainable idea of mobility, while increasing community's sociability. Nevertheless, the topic of road safety should be accompanied to the creation of walking and bike buses, through educational paths and the realisation of actions aimed at reducing congestion, such as traffic-restricted zones and the congestion charge.

All in all, strategy 5, concerning the discouragement of the use of personal cars, according to the Environmental Report, will produce positive effects on air quality, energy efficiency, noise pollution, environmental safeguard of water resources, nature and biodiversity and reduce the negative impacts on soil and subsoil, cultural heritage and landscape, while promoting security, social equity, information and participation, better public health and urban environment's quality.

3.3 Similarities and differences between the two SUMPs

To sum up, the two SUMP's present both similarities and differences concerning their structures and contents. In particular, the two Plan Documents analysed highlighted that the preparation of the respective SUMP's coherently followed the Italian guidelines' indications examined in chapter 2. Indeed, it is possible to observe that the Italian government, through its Ministerial Decree¹⁴¹ for the identification of the guidelines for the preparation of the SUMP's, clearly invited local authorities to conform the plans' preparation process and structures to the recommendations provided at a national level, showing a top-down approach. Moreover, the guidelines impose the inclusion in the plans of 17 macro-objectives. Therefore, the majority of the goals pursued by the two plans are identical, with just some additional and different objectives, based on the priorities highlighted during the participatory phases of the plans' creation.

However, the main differences of the plans reside in the development of the tools to employ for the achievement of their goals. First, it is important to point out that, how it was demonstrated in the sections dedicated to the description of their characteristics, the two selected areas are extremely different for their territorial extension, number of inhabitants, geo-morphologic configuration and socio-economic characteristics. Indeed, the SUMP of Padua covers 19 Municipalities with about 450.000 residents. Padua is the main urban pole for University, healthcare and commercial reasons, and the other surrounding municipalities are still relevant in terms of tourism and industries at a regional level. By contrast, the SUMP of the Metropolitan City of Roma Capitale covers 121 municipalities, with a population of approximately 4.200.000 inhabitants. Rome represents the main urban centre, while the other municipalities of the functional urban area have a marginal role, with their inhabitants systematically travelling towards the urban centre. However, in both areas systematic car use represents a major problem in terms of traffic congestion, air and noise pollution, GHG emissions and accidents.

While both SUMP's dedicate a huge package of measures to infrastructural works, that of Roma Capitale clearly highlights the environmental, social and economic aims and

¹⁴¹ Individuazione delle linee guida per i piani urbani di mobilità sostenibile, ai sensi dell'articolo 3, comma 7, del decreto legislativo 16 dicembre 2016, n. 257, Decreto 4 agosto 2017 (Italia), <https://www.gazzettaufficiale.it/eli/id/2017/10/05/17A06675/sg>.

impacts of its foreseen interventions. As a matter of fact, although infrastructural works are a traditional transport planning tool, the clarification of the connection between different policy dimensions related to them make these actions in line with the SUMP logic. SUMPs' main objective, indeed, is the creation of mobility policies that tackle environmental, social and economic issues simultaneously, as prescribed by the definition provided by the Italian government. An example in the context of infrastructural works, the development of bike lanes is roughly presented by PUMS Co.Me.Pa. as a way to stimulate active mobility, public health and to foster environmental sustainability, while the SUMP of Rome adds a deeper social justice connotation to the employment of this tool. Indeed, in this framework, bike paths are seen as a solution to link peripheral and fragile areas to the city centre, providing a sustainable travel option also for people who cannot afford the ownership of a personal car. Also in the field of "management-related" measures, the SUMP of Rome better underlines the linkages between social, environmental and economic issues tackled by its package of measures. An example is the institution of the 15-minute city, as places where environmentally-friendly travel solutions are combined with positive social aims, such as an improved liveability and cooperation among citizens. Therefore, in addition to the different types of instruments proposed by the two plans, the environmental, social and economic effects of the measures are more explicitly and extensively analysed by the SUMP of the Metropolitan City of Rome, than in the case of Padua. Moreover, a difference between the two plans lie in the level of transparency guaranteed by them. While the SUMP of Rome provides recordings, updates on social networks and the documents with the detailed outcomes of the participatory activities with the public, the SUMP of Padua mentions some results of the engagement of citizens and stakeholders, without making the related documents available online.

Conclusion

In conclusion, this research has analysed the meaning of eco-social policy integration in the EU's mobility sector, with a focus on Sustainable Urban Development Plans. The first chapter underlines the importance of tackling mobility policies in an integrated way, in light of the environmental, social and economic challenges emerging from this sector. Indeed, the transport sector is a key driver of the economy of the EU¹⁴², but also the main contributor to the production of GHG emissions in Europe¹⁴³. GHG emissions, together with air, noise pollution and landscape fragmentation constitute the main environmental issues related to the transport sector. These problems cause a series of negative social effects, such as public health risks¹⁴⁴ and a decreasing people's well-being related to traffic congestion and pollution. Moreover, being mobility an essential freedom of European citizens¹⁴⁵, it is associated with a number of social justice questions, including its accessibility in economic, physical and geographical terms. The first research objective aimed at understanding whether and how the European Union has integrated the environmental and social dimensions in its mobility policies since 1992. The EU's mobility policies between 1992 and 2020 have shown an increasing eco-social policy integration effort. While the first Communication by the Commission dealing with the application of the sustainability principle to the transport sector essentially focused on social and economic objectives, the last available policy document in the framework of the European Green Deal better communicated the need to integrate environmental, social and economic dimensions. Indeed, as Mandelli underlines, eco-social policies are public policies which explicitly aim at achieving both environmental and social objectives

¹⁴² "Transport", European Union, https://european-union.europa.eu/priorities-and-actions/actions-topic/transport_en#:~:text=Transport%20is%20also%20a%20major,employ%20around%2011%20million%20people.

¹⁴³ European Environment Agency, *Transport and Environment Report 2022 – Digitalisation in the mobility system: challenges and opportunities*, 2022, doi:10.2800/47438.

¹⁴⁴ Kryzanowski, Michal et al. (eds), *Health effects of transport-related air pollution*, World Health Organization Europe, 2005, <https://apps.who.int/iris/bitstream/handle/10665/328088/9789289013734-eng.pdf?sequence=3&isAllowed=y>.

¹⁴⁵ Commission of the European Communities, *Communication from the Commission – A sustainable future for transport: Towards an integrated, technology-led and user friendly system*, 2009, <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2009:0279:FIN:EN:PDF>.

in an integrated way¹⁴⁶. However, also in the case of the European Green Deal, a sectoral approach to policy objectives prevails, with social, economic and environmental goals divided into different building blocks.

From the different EU's policy documents analysed emerges the importance of urban areas as places where economic activities, environmental issues and social challenges are concentrated. Indeed, in 2013, the European Commission prescribed the creation of Sustainable Urban Development Plans, as a strategic instrument aimed at promoting mobility management through an eco-social integrated way, exploiting innovation, and granting local authorities and citizens a driving role in their implementation. Therefore, the Europe's observatory on urban mobility published its guidelines for the preparation and implementation of SUMP, where eco-social policy integration is presented as one of the overarching principles for the creation of the plans. Accordingly, the Italian government elaborated a vademecum for local authorities and made SUMP mandatory by law for cities with more than 100.000 inhabitants. The definition of SUMP provided by the Italian government stresses the importance of achieving environmental, social and economic goals. However, the objectives imposed to urban areas by the Italian government's vademecum are divided according to different policy fields, without combining environmental, social and economic dimensions.

The Italian "top-down" approach to the elaboration of SUMP on a local level can result in the creation of similar SUMP in different urban areas. Indeed, the case studies of the SUMP of the *Conferenza Metropolitana di Padova* and that of the *Città Metropolitana di Roma Capitale* have been analysed, in order to understand whether these two plans present similarities, regardless of their different contexts. The second research objective aimed at assessing whether and how the integration of social and environmental dimensions have been achieved at the local level. The SUMP of Padova discontinuously makes its intention to tackle environmental and social issues simultaneously clear, despite proposing a huge package of measures that have an intrinsic eco-social integration potential. By contrast, the SUMP of Rome deeply analyses the environmental,

¹⁴⁶ Mandelli, Matteo, "Understanding eco-social policies: a proposed definition and typology", *European Review of Labour and Research* 28, no.3 (2022): 333-348, <https://doi.org/10.1177/10242589221125083>.

social and economic objectives in the framework of each of its instruments proposed. Therefore, it is possible to argue that the SUMP of Rome is an example of eco-social policy, where explicit aims to achieve both environmental and social objectives in an integrated way are clearly claimed. Future research could focus on the actual implementation of the measures proposed by the SUMPs, in order to assess whether eco-social integration also occurs in practice.

Overall, this study shows that policies of the EU in the mobility sector reach not only the national but also the local level. Indeed, the indications provided by the different Communications of the Commission on how sustainability should be applied to the field of mobility have been translated into general European recommendations, specific national guidelines, and targeted local Sustainable Urban Mobility Plans. SUMPs are a clear demonstration of the direct impact of European policies on local communities.

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