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Living and Walking in Cities

Mobility, Public Space and Spatial Justice

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Living and walking in cities: Mobility, Public Space and Spatial Justice

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Sustainable Urban Mobility Plans and active mobility. An assessment through the lens of justice

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Abstract
Sustainable Urban Mobility Plans (SUMPs) are strategic spatial planning tools to address urban mobility needs. The European Commission encourages member states to develop SUMPs to improve quality of life through collaboration with authorities at multiple levels. SUMPs aim to make non-motorised transport safe and accessible, encouraging a shift toward sustainable and active mobility. Within this context, a justice framework offers a valuable lens to assess how fairly resources for active mobility are distributed and accessed. Although active mobility is often linked to mobility justice, the integration of justice dimensions, e.g. distributional, procedural, recognitional, and restorative, is not always ensured in SUMPs. This paper examines how SUMPs address active mobility through the lens of justice, focusing on distributional and procedural justice, in eight European JUST STREETS pilot cities. It assesses to what extent SUMPs prioritise walking and cycling and how street space allocation and participatory processes reflect fairness and inclusivity. The analysis highlights the potential and limitations of SUMPs in advancing mobility justice, identifies gaps in how justice dimensions in walking and cycling are incorporated. It also provides practical recommendations to enhance active mobility strategies. These insights support cities in developing their SUMPs towards more equitable and climate neutral mobility systems.

Keywords
Sustainable Urban Mobility Plans; Active mobility; Just streets; Mobility justice

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1. Introduction

Urban mobility plays a key role in sustainable development, particularly as over 70% of the European population reside in urban areas where transport significantly contributes to greenhouse gas emissions. The European Commission promotes Sustainable Urban Mobility Plans (SUMPs) to address the long-term economic, social, and environmental challenges associated with urban mobility. These plans provide a strategic framework to enhance accessibility, reduce environmental impacts, and foster resilient, efficient, and inclusive transport systems (EU COMM, 2020a, 2020b; Eltis, 2019; Munkácsy et al., 2024; Spadaro et al., 2023). The SUMPs represent a new generation of transportation plans that move from traditional approaches to sustainable transportation planning. They prioritise the mobility needs of individuals over vehicles and reimagine streets as multifunctional public spaces (Torrisi et al., 2020). Active mobility (walking and cycling) is also increasingly recognised as a viable strategy to achieve sustainable mobility (D'Amico, 2024). To mitigate urban mobility impacts, policymakers promote active mobility through transport policy tools such as road pricing, public transit improvements, investment in active travel infrastructure, technological innovation, and behaviour change campaigns (Banister, 2008; Dalkmann & Brannigan, 2007; Steg & Vlek, 2009).

Since 2013, EU local authorities have been encouraged to adopt SUMPs with the support of national and regional governments (Klímová & Pinho, 2020). The EU supports SUMPs through platforms like Eltis and initiatives (e.g., EU Mobility Week) to facilitate knowledge-sharing and promote best practices in sustainable mobility. Importantly since urban functionality cannot stop even under strict anti-car policies, a modal shift from private vehicles to local public transport (LPT) and non-motorised modes is essential (Van Wee, 2007). Updated SUMP guidelines also invite for dedicated planning and infrastructure for cycling and walking (Eltis, 2019).

While technical aspects and modal shift have received substantial attention, a crucial perspective often remains underexamined: mobility justice. Questions of uneven access and movement persist in transport research (Wachs & Kumagai, 1973). Mobilities scholars examined and conceptualised daily mobility disparities (Verlinghieri & Schwanen, 2020) through ideas such as 'motility' (Kaufmann, 2017) and critically interrogated the discursive frameworks that legitimise and normalise these inequalities by dominant narratives (Sheller, 2018). Their proposals reveal how infrastructure, material conditions, and the embodied practices of movement such as "stopping, going, passing, pausing, and waiting" shape unequal mobility experiences (Sheller, 2018, p.23; Adey et al., 2014).

The paper builds on this perspective by examining how justice is incorporated into active mobility planning within SUMPs across eight European cities (i.e. Amsterdam, Braga, Cugir, Kozani, London, Metropolitan City of Milan, Riga, Vilnius), drawing from the JUST STREETS project. Using a qualitative and justice-informed methodology, the research involves a literature review, content analysis, and a comparative assessment of justice-oriented goals and actions to identify the gaps, patterns, innovative practices and offer policy insights that help local governments, policymakers, and practitioners strengthen active mobility strategies in their SUMPs.

2. Literature and practice overview

2.1 Mobility justice

The concept of justice is complex, multidimensional, and context-dependent, shaped by philosophical, political, sociological, and spatial discourses. Within urban and transport planning, John Rawls' "A Theory of Justice" (1971) remains a foundational reference and grounds the principle of justice in fairness, equality of opportunity, and the veil of ignorance as a tool for imagining impartial societal arrangements. Rawls' idea has had far-reaching influence by providing a normative framework for evaluating accessibility and equity in transport systems.

Building on Rawlsian theory, Karel Martens (2016) has extended these principles to the domain of mobility in his seminal work "Transport Justice". Martens introduces a normative framework that positions accessibility as defined the ease of reaching essential services and opportunities as a key social good derived from collective cooperation. His approach incorporates procedural and recognitional justice by promoting inclusive planning processes and acknowledging marginalised voices. While influential, Marten's framework has been criticised for its limited scope, as it focuses narrowly on transportation. This limitation has led to the emergence of mobility justice as a broader and more critical framework notably through the work of Sheller and Urry (2000). Mobility justice reframes access not only as physical movement but also as access to opportunities, which are often unequally distributed across populations (Sheller, 2018). Rooted in the early 2000s' "new mobilities paradigm" (Sheller & Urry, 2000), which reconceptualised places as relational and fluid rather than fixed and bounded (Massey, 1991), mobility justice moves beyond a narrow focus on infrastructure and transport networks. It examines how power and inequality shape mobility patterns, offering a vital perspective for addressing the challenges of sustaining everyday life in the context of intensifying climate crises (Sheller, 2020). Central to this discourse, mobility justice promotes low-carbon, liveable, localised, and socially inclusive communities, emphasising not only the right to mobility but also fairness in mobility experiences (Sheller, 2018). As Sheller notes, contemporary patterns of mobility and immobility are historically embedded in systems of colonialism, extractivism, and patriarchy, shaping material and relational dynamics in the present (Harada, 2023). Mobility justice becomes visible on the streets where rights, access, and social life interact. Rather than considering streets solely as infrastructure for moving people and goods, it is a public space where social interactions, rights and mobility intersect (Prytherch, 2018 pp.13-14). Mobility, therefore, is more than just movement—it is a matter of social justice, involving the equitable distribution of access, benefits, and burdens associated to urban transportation. Moving beyond technocratic and car-centric models, the "just street" is conceptualised as a space where mobility becomes a matter of ethics, equity, and access (Hartman & Prytherch, 2015). A just street includes not just access to public space, but also the ability to co-produce urban space through both "everyday life" (Lefebvre et al., 1996, p.179) and "imperative planning" (Prytherch, 2018, pp.18-19). This means recognising the street as "medium of citizenship" and "theatres of social life" (D'Arcus, 2006) where diverse people encounter each other and assert claims to space, rights, and recognition. Sheller's framework identifies multiple dimensions of justice (Tab.1) and emphasis their multiscalar nature of mobility justice relevance, from the bodily to the planetary (Sheller, 2018, pp.18-29). This multiscalar approach reveals how the politics of mobility intersect with broader structural dynamics to evaluate the fairness in distribution of social services, economic, political and governance systems in urban areas (Sheller, 2018, pp.24-26). Going further, Verlinghieri and Schwanen argue that justice in mobility must move beyond redistribution to engage with power relations, embodied experiences, and socio-technical systems (Verlinghieri & Schwanen 2020). They call for a deeper engagement with ethical and political questions, emphasizing that justice must be co-created by and with those who are most affected by mobility systems.

Justice dimension	Description
Distributive justice	Ensures fair sharing of the benefits and burdens of mobility transition across various social groups.
Procedural justice	Promotes inclusive participation and governance in decision-making, giving all communities a voice
Recognitional justice	Acknowledges and addresses the specific needs, identities, and vulnerabilities of different populations, including historically marginalized groups.
Restorative justice	Aims to correct historical injustices by implementing policies that redress past harm in mobility planning.

Tab.1 Justice in the context of sustainable transitions (authors' elaboration, based on (EEA, 2024))

Building on this foundational work, the European Environment Agency (EEA, 2024) recalls the four dimensions of justice that have been gradually established in the socio-spatial justice debate, by framing justice within the context of sustainability transitions including distributive, procedural, recognition, and restorative justice. Overall, mobility justice adopts an intersectional lens to tackle injustices embedded in the physical and social conditions of contemporary life (Harada, 2023).

In this paper, to analyse the SUMPs of the JUST STREETS pilot cities through the lens of justice, distributional and procedural justice have been employed, as they are the most directly actionable within urban mobility planning. Distributive justice is interpreted as fair allocation of space and resources across social groups and urban areas, ensuring that benefits and burdens of mobility systems are equitably shared. Procedural justice, by contrast, is considered an inclusive and democratic decision-making process where diverse stakeholders are meaningfully involved in planning, implementation and evaluation stages.

2.2 Active mobility

Active mobility, typically understood as human-powered modes such as walking and cycling, is increasingly acknowledged as a key element in achieving sustainability goals across political levels (Rietveld, 2001). The terminology surrounding active mobility has evolved over time. Earlier labels such as "non-motorised modes", "slow modes" or "low-speed modes" were used imprecisely to describe walking and cycling (Rietveld, 2001; Rodier et al, 2003), while terms like "sustainable transport" and "micromobility" expanded to include eco-friendly motorised options. To provide a more inclusive definition, recent literature defines active mobility as any form of transport powered by physical effort and directly contributing to movement. This includes walking, cycling, running, scooting, and wheelchair use while excluding modes such as e-scooters that require minimal effort to initiate movement (Cook et al., 2022; Rainieri et al., 2024). Taken together, these dynamics highlight the evolving nature of mobility in urban contexts. Urban mobility plays a central role in urban functionality, accessibility, and social equity. It also supports economic activity, urban vitality, while shaping patterns of inclusion, environmental impact, and quality of life. As a result, it occupies a key position in planning and policy agendas that seek to balance efficiency with long-term sustainability. However, the future of urban mobility remains uncertain and is influenced by factors such as demographic shifts, economic and regional disparities, evolving travel behaviours, and unpredictable global crises (Munkácsy et al., 2024). Beyond its environmental and health benefits, active mobility also intersects with the concept of urban mobility justice. The ability to walk or cycle safely and comfortably in cities is not equally available to all populations (Gössling, 2016). Inequities in infrastructure provision, spatial planning, and policy priorities lead to uneven access to active mobility options, particularly for people living in peripheral areas or disadvantaged neighbourhoods (Pereira et al., 2017). Therefore, promoting active mobility raises important justice-related questions in terms of fair allocation of resources, inclusion in decision-making processes, and recognition of diverse mobility needs and experiences (Sheller, 2018). From this perspective, mobility policies should support sustainable modes of transport and ensure that their benefits are shared equitably across all social and spatial groups. In this research, active mobility is examined as a key component of sustainable and just urban transport due to its affordability, low-carbon nature, and potential to improve access to public spaces and essential services. Although, Walking and cycling are often promoted as socially equitable modes, assessing their justness is complex. Engagement in active mobility depends on infrastructures quality and safety, individual ability, spatial conditions, and broader socio-economic contexts. This paper, therefore, analyses how active mobility is addressed and supported in SUMPs from a justice perspective.

2.3 Sustainable Urban Mobility Plans (SUMPs)

Sustainable Urban Mobility Plans (SUMPs) reflect a transformative shift in urban mobility planning from car-centred paradigms towards transport systems that prioritise people-centred, low-emission, and equitable. In

doing so, SUMPs address mobility needs alongside environmental, social, and economic goals in urban and peri-urban areas (Jordová & Brůhová-Foltýnová, 2021).

The European Commission (EU, 2023) defines key objectives for SUMPs, including:

i) Accessibility and quality of life - ensure equitable access to destinations and services for all including vulnerable groups;
ii) Environmental sustainability - reduce pollution, greenhouse gas emissions, and reliance on fossil fuels through modal shifts and clean mobility;
iii) Social equity and inclusion - promote fair distribution of mobility opportunities and recognise the specific needs of disadvantaged populations;
iv) Health and safety - enhance walking/ cycling conditions and reduce traffic injuries;
v) Integrated policy and governance - foster cross-sector collaboration between transport, land use, health, energy, and environmental domains.

The SUMP process follows a 12-step iterative methodology (European Platform on Sustainable Urban Mobility Plans, 2019) that covers preparation, visioning, implementation, and monitoring. The SUMP process begins by establishing inclusive governance structures and engaging stakeholders to ensure transparency and participation. Initially, Cities assess the current mobility context, identify spatial inequalities, and co-develop scenarios to imagine more inclusive futures. These scenarios are translated into strategic visions and then into SMART targets (i.e. Specific, Measurable, Achievable, Relevant, Time-bound). They are operationalised through integrated policy that balances infrastructure investments and behavioural interventions. Implementation proceeds in phases and is adjusted over time. Its success depends not only on technical reliability but also on responsiveness to community feedback and urban dynamics. While SUMPs provide a promising planning tool, scholars warn that justice dimensions could be overlooked. As Wågsæther et al. (2022) argue, even well-intended sustainability transitions can create "justice pitfalls" (*ibid*), i.e. unintended redistributive, procedural, or recognition-based inequities. For instance, tolling systems or urban densification may place a disproportionate burden on low-income residents or exclude suburban voices from planning discourses. Schwanen (2021) notes that distributive justice—concerned who benefits and who bears the costs—is necessary but insufficient. Procedural justice which emphasises inclusive participation, and recognition justice which acknowledges diverse mobility needs and lived experiences, are equally essential. If SUMPs focus narrowly on climate and efficiency goals, they risk marginalising the interests of groups they aim to improve. Moreover, Schwanen highlights the epistemic justice which calls for recognising the legitimacy of local, experiential, and marginalised knowledge in shaping mobility transitions. This requires expanding planning approaches to include tools such as storytelling, participatory mapping, and deliberative forums that centre non-dominant voices. To align SUMPs with the principles of just transition, a shift towards transformative governance is required (Schwanen, 2021). This includes: i) actively reducing the dominance of automobility and enabling inclusive active transport; ii) co-producing policies with underrepresented communities; iii) assessing interdependencies between mobility, housing, and social systems; and iv) recognising spatial and temporal inequities that affect access and agency. Ultimately, the success of SUMPs depends not only on meeting emission targets but also on developing mobility systems that are resilient, inclusive, and co-owned by diverse urban communities. In this sense, justice must be embedded as a core principle in all phases of sustainable urban mobility planning.

3. Research design and methodology

In this study, a qualitative comparative methodology is applied to assess how distributional and procedural dimensions are integrated into SUMPs in the eight JUST STREETS pilot cities. The analysis is structured in three phases while combining content analysis with a justice-informed analytical framework. The first phase conducted a detailed qualitative review of the SUMP to establish a contextual understanding of its structure,

objectives, and policy priorities. This step formed a foundational overview of how sustainable and active mobility goals are expressed in various contexts. The second phase applied a systematic content analysis of the SUMP documents by using a predefined coding framework centred on distributive and procedural justice. According to this analysis, the research focused on three core elements: 1) the prioritisation of active mobility within SUMP objectives; 2) the allocation of spaces and resources for walking and cycling (distributive justice); and 3) the fairness and democratic decision-making processes (procedural justice). In the third phase, a cross-case comparative analysis was conducted to identify patterns, divergences, and innovative practices across the eight cities. This comparison was based on the structured data extracted through the content analysis and was guided by a justice-focused analysis. Particular attention was given to space and resource allocation for active mobility, the institutional frameworks governing participatory planning, and the alignment between stated goals, implementation tools and monitoring mechanisms. Ultimately, the findings inform the development of targeted policy recommendations aimed at enhancing the integration of active mobility through a justice-oriented lens within the SUMPs of the pilot cities. By identifying systemic gaps in spatial equity, infrastructure investment, and stakeholder inclusion, the study offers actionable insights to help urban planners, policymakers, and practitioners recalibrate their strategies. These recommendations support the core objective of the JUST STREETS project, which is to promote mobility systems that are sustainable, inclusive, participatory, and socially just. Mobility justice is conceptually grounded in an intersectional perspective that recognises how the intersection of social identities and capabilities shape mobility experiences. However, this research did not explicitly operationalise intersectionality. Alternatively, it concentrated on the two most tangible and measurable dimensions—distributional and procedural justice—providing a pragmatic yet justice-informed foundation for analysis.

4. How just are our streets? A comparative analysis of SUMPs in JUST STREETS cities

4.1 SUMPs objectives and active mobility strategies

This section examines the integration of active mobility into the SUMPs of the pilot cities, to understand its conceptualization, main characteristics, and the primary objective of each plan. The analysis explores the extent to which active mobility is prioritised as a core objective and evaluates the measures taken to enhance pedestrian and cycling infrastructure (Tab.2). The incorporation of active mobility into SUMPs across pilot cities reflects both aspirations and context-specific priorities. While all the cities recognise walking and cycling integral to sustainable transport transitions, the degree of integration, strategic framing, and implementation varies substantially.

In pilot cities such as Amsterdam and Metropolitan City of Milan, active mobility is treated as a strategic priority and deeply embedded with broader goals of environmental efficiency and modal shift. The SUMP of Amsterdam intends to optimise existing infrastructure over expansion with cycling and public transport and further reduces the demand for private cars. This strategy supports the broader objective of meeting rising mobility demands while addressing climate targets and social inclusion. Similarly, the SUMP of the Metropolitan city of Milan supports a low-impact mobility strategy through the development of comprehensive cycling network through its dedicated *Biciplan* (Urban Plan for Cycling Mobility). This is complemented with pedestrian safety improvements around key nodes particularly around schools, transit hubs, and public institutions. The Metropolitan city of Milan illustrates how large-scale cycling networks can encourage behavioural change and foster integration across transport modes at the metropolitan level. Conversely, cities such as Cugir and Kozani consider a more socially oriented approach. The SUMP of Kozani explicitly connects active mobility with accessibility and inclusion by targeting improvements for vulnerable users and linking walking and cycling to public health and safety.

Pilot Cities	Overview
Amsterdam (NE) | 2013	**Title:** Mobility Approach Amsterdam 2030 **Objective(s):** Prioritise cost-efficient and space-saving modes of transport while optimising the infrastructure use
	Active mobility strategies: Expanded bike parking | Indoor bike/car garages | Priority bike lanes (red asphalt, traffic signals) | Faster service during peak hours | More comfortable, reliable off-peak travel
Braga (PT) | 2019	**Title:** SUMP for the City of Braga **Objective(s):** Promote soft modes (walking, cycling), public transport, reduce car use, and support intermodality
	Active mobility strategies: Expansion of pedestrian zones | Accessible sidewalks and crossings | Safe and walkable school routes | Cycling network with segregated lanes and more bike parking | Bike-sharing system and e-scooter regulation
Cugir (RO) | 2023	**Title:** SUMP 2022-2030 (PMUD) **Objective:** Provide an accessible, safe, sustainable transport system in urban and peri-urban areas.
	Active mobility strategies: Improved sidewalks and pedestrian infrastructure in central, residential zones, underpasses, and crossings for safety and accessibility | New cycling lanes connecting residential areas and schools | Bike parking | Integration of cycling in new urban planning zones
Kozani (GR) | 2020	**Title:** SUMP of the Municipality of Kozani (PMUD) **Objective(s):** Develop a sustainable, inclusive mobility system by shifting from car use to active/shared modes, improving quality of life, and integrating smart technologies
	Active mobility strategies: Expansion of pedestrian zones and green routes | Improvement of sidewalks, crossings, and ramps for accessibility | Safe school zones | Aesthetic interventions and traffic calming in central areas | Expansion of bike lanes, bike-sharing, and bike parking across the city
London – Westminster (UK) | 2017/2014	**Title:** Walking strategy - Cycling strategy **Objective(s):** Make Westminster a national leader in walking and cycling by improving safety, accessibility, and uptake of active travel modes
	Active mobility strategies: Develop Central London Cycle Grid with links to key destinations | Improve junction safety and identify high-risk locations for cyclists | Expand cycle routes, bike parking, facilities | Promote cycling and offer through training, school plans, campaigns, events, toolkits, incentives, and business engagement | Expand pedestrian space and crossings | Enhance public spaces with seating, greenery, and clear signage| Ensure pedestrian safety via 20mph zones, and safer junctions| Improve streets more accessible for all, especially older and mobility-impaired residents | Encourage walking through school and community programs
Metropolitan City of Milan (IT) | 2021	**Title:** SUMP of the Metropolitan city of Milan **Objective(s):** Meet urban and metropolitan mobility demand
	Active mobility strategies: Creation of safe and walkable access to public transport nodes | Urban design interventions for safety and comfort (e.g., crossings, sidewalks) | Support for vulnerable groups and reduced-mobility users in planning | Metropolitan cycling network (*Biciplan*) | Bike parking at major hubs (schools, hospitals) | Expansion of bike-sharing and promotion of pedal-assisted bikes | Safer infrastructure via lighting, signage, and design guidelines
Riga (LV) | 2020	**Title:** Towards a better everyday life Riga mobility vision **Objective(s):** Create a sustainable, inclusive, people-centred mobility system for equality of life, urban liveability, and public health, while addressing environmental and economic challenges
	Active mobility strategies: Expanded pedestrian networks and direct access to destinations | Safe crossings, seating, and snow/ice removal for year-round walkability | Focus on children, elderly, and people with disabilities | Continuous cycling routes with secure parking and safe design | Promotion daily noy just recreational bike use
Vilnius (LT) | 2018	**Title:** Vilnius city sustainable mobility plan – action plan (SUMP) **Objective(s):** Create clean, safe, inclusive, and sustainable urban mobility systems, enhance quality of life, a modal shift from walking and cycling and support climate neutrality initiative
	Active mobility strategies: Upgraded pedestrian network with lighting and safety measures | Universal design for crossings and sidewalks | Reduced car dominance and improved walkability in the Old Town | Measures to increase walking speed and comfort | Development of a high-quality, city-wide bike path network | Bike storage and charging infrastructure near houses and transit stops | Expanded bike sharing and signage | Cycling promoted in education and safety campaigns

Tab.2 Overview of SUMPS' objectives and active mobility strategies

Kozani exemplifies the challenges of behavioural and modal shift in smaller cities particularly in reducing car use and adapting mobility systems to the needs of older adults. The SUMP of Cugir, a smaller Romanian city

with a more recent plan, pedestrian movements is recognised as fundamental but is addressed largely in descriptive rather than operational terms showing a less systematised approach. Cugir provides insights into how small cities address mobility, safety and accessibility, with attention to social groups with disabilities in shared spaces. Braga, Vilnius, and Riga offer examples where active mobility is framed within wider sustainability and liveability agendas. The SUMP of Braga extends infrastructure investments beyond the city centre to promote spatial equity with a focus on school mobility and child-friendly public space. In contrast, the SUMP of Vilnius aligns with the EU's climate-neutral cities initiative and sets measurable targets for walking and cycling speeds and coverage. Vilnius reveals efforts in addressing car dependency by transforming the city centre into a multifunctional, low-speed, and pedestrian-oriented environment. The SUMP of Riga positions walking and cycling at the top of its mobility hierarchy with an emphasis on small-scale interventions that improve safety and accessibility. Although, it also acknowledges existing fragmentation in the cycling network, poor pedestrian infrastructure and thus prioritises infrastructure continuity. Riga embeds active mobility goals within a long-term strategic framework by using modal hierarchies and clear targets to promote accessible and low-emission transport for all. Meanwhile, the City of London-Westminster advances active mobility through two complementary policy documents: the Walking Strategy and the Cycling Strategy. This separated model enables a more targeted policy focus, where walking is recognised as the most universal, inclusive, and accessible mode of mobility, while cycling is presented as a sustainable, low-emission, and health-enhancing alternative to motorised travel. Both strategies highlight the role of active travel in broader goals such as social equity and public health. Simultaneously, Westminster illustrates the equity challenges of congested urban centres, where dense high streets can marginalise vulnerable users and underscores the need for inclusive street design.

Overall, the comparison reveals that while all cities promote active mobility, the scope and depth of the engagement differ according to the local priorities and planning cultures. From infrastructure-based strategies in Amsterdam and the Metropolitan City of Milan to inclusion-based measures in Kozani and performance-driven planning in Vilnius, these SUMPs illustrate how active mobility is not only a transport issue but also a lens through which a broader social, environmental and spatial goals are pursued.

4.2 Fair allocation of spaces and resources: an inquiry through the lens of distributive and procedural justice

This section compares how pilot cities integrate distributional and procedural justice in active mobility planning by focusing on how resources are allocated and how people are involved in decision-making. By examining resource allocation and participatory processes, it highlights key trends, policy approaches, and challenges in promoting active and sustainable mobility systems that aligned with the goals of the JUST STREETS project.

In cities such as Braga, Kozani, and Vilnius, resource allocation reflects a clear commitment to walking and cycling through people-centred investments. In Braga, the "walkable city" and "cyclable city" strategies allocate funds to sidewalk improvements, school safety zones, and integrated cycling infrastructures. Similarly, Kozani focuses on citywide pedestrianisation, safe school areas, and green corridors, backed by phased bicycle-sharing infrastructure as part of the broader mobility ecosystem. Vilnius stands out for setting clear and measurable goals (e.g., 65 km of pedestrian paths annually) and the alignment of its efforts with the EU's "100 climate-neutral cities" initiative by targeting a 30% walking modal share by 2030.

Braga and Kozani structure public participation through formal governance frameworks. Braga's planning process brings together institutions, local government and business sectors with political support as a critical point for implementation. Kozani adopts a scenario-based model, linking public engagement directly to long-term planning horizons. Through participatory workshops and institutional feedback, the city drafted conservative, moderate, and radical development scenarios, each aligned with fundings and policy timelines. Vilnius complements its investment commitments with iterative participatory tools like satisfaction surveys and

working groups. These demonstrate measurable responsiveness and reflect in the improved ratings for pedestrian infrastructure over time.

Pilot cities	Active mobility in justice dimensions
Amsterdam	**Distributional justice:** Imbalance in cycling and pedestrian facilities; pedestrian infrastructures underprioritised despite growing importance | Unequal spatial allocation
	Procedural justice: Multi-level collaboration | Place-based strategies | Feedback loops for adjustments | Supporting city by offering clear regulatory frameworks, open data, and procurement initiatives
Braga	**Distributional justice:** Allocation of resources to central and peripheral areas | Sidewalk improvements | Universal accessibility measures
	Procedural justice: Multi-level governance system | Active political involvement and monitoring mechanisms to guide implementation
Cugir	**Distributional justice:** Fragmented pedestrian network | Vehicle dominance | Investment in safer and connected routes including recreational areas
	Procedural justice: Citizen-centred planning with NGOs, emergency services, and local authorities | Mayor/deputy-led action group for monitoring | Transparent approach
Kozani	**Distributional justice:** Focus on vulnerable users, school safety zones, sidewalk upgrades, improve accessibility and equity across city
	Procedural justice: Participatory workshops and stakeholder engagement define priorities; resource allocation guided by long-term scenarios (5, 10, 15 years) | Mixed funding sources
London (Westminster)	**Distributional justice:** Investments target high-footfall and high-risk areas | Funding supports infrastructure and behavioural change | Promotes accessibility and public health
	Procedural justice: Engagement with residents, BIDs, schools, and health professionals; Feedback shaped spatial focus and targets
Metropolitan City of Milan	**Distributional justice:** High modal share in public and active transport | Investments linked to national/regional mobility strategies | Inclusion of suburban and central areas in planning
	Procedural justice: Structured engagement with municipalities and civil society | 2019-2020 feedback shaped spatial interventions and priorities
Riga	**Distributional justice:** Equity goals constrained by dependence on EU infrastructure funding | Risk of favouring large-scale over local active mobility improvements
	Procedural justice: Inclusive input from residents, NGOs, children, elderly; universal accessibility and inclusive design embedded in process
Vilnius	**Distributional justice:** Clear equity targets (e.g., 30% walking modal share) | Investments in safety and accessibility | Aligning with climate-neutral and inclusive planning goals
	Procedural justice: Iterative stakeholder engagement via working groups and surveys | Satisfaction scores improved in response to public feedback

Tab.3 Active mobility planning analysis through distributional and procedural justice

In contrast, Amsterdam represents an infrastructure-rich model that favours cycling and public transport with measurable modal shift outcomes. However, relatively limited investment in pedestrian infrastructure reveals spatial imbalance, especially as walking becomes more prominent in commercial zones. This hints the need for a more holistic strategy includes all active mobility modes. In terms of procedural justice, it adopts a dynamic and feedback-driven model that goes beyond traditional consultation by engaging municipal agencies, transport operators, and private sector actors in area-based strategies. Local council initiatives help channel community demands into mobility policy, while ongoing monitoring ensures adaptive responses. This contrast between strong participatory engagement and uneven investment distribution illustrates the complexity of achieving balanced active mobility planning.

The Metropolitan City of Milan and London (Westminster) demonstrate comprehensive and multi-level funding strategies. Metropolitan City of Milan aligns its phased investment framework with regional and national cycling policies while reflecting a strong commitment to sustainable modes and reduce the reliance on private vehicles. Westminster combines infrastructure investment with behavioural change campaigns though leveraging diverse funding sources to create high-quality pedestrian and cycling environments across dense and congested areas. The participatory planning processes are similarly embedded within well-established urban

governance systems. Westminster's engagement process brings together residents, schools, health professionals, and business groups, whose input shaped both target-setting and spatial focus. Metropolitan City of Milan's participatory process (2019 –2020) involved coordinated engagement across municipalities and civil society forums by reinforcing the strategic direction of its mobility investments.

In Cugir and Riga, active mobility investments are growing but remain constrained. For instance, Cugir's pedestrian network is still fragmented despite of the progress in more connected cycling infrastructure. On the other hand, while Riga advancing a socially equitable mobility vision, it depends on EU infrastructure funds which may favour large-scale over local scale projects and stand in contrast to their participatory efforts. Cugir's approach emphasises citizen co-ownership of the planning process. In this respect, a multidisciplinary team worked with local stakeholders across all stages, supported by a mayor-led action group that maintains community dialogue and accountability. Riga foregrounds participatory governance as a foundational principle and its planning process actively includes diverse stakeholder groups, notably children, elderly residents, and NGOs. The commitment to universal accessibility is not only a design goal but also a participatory ethos, embedded in the structure of the planning process itself.

Overall, this comparative analysis reveals the multifaceted relationship between how cities fund active mobility and how they engage communities in shaping these investments. The interplay between financial strategies and participatory models across the case cities is summarised in (Tab.3) which is offering a structured view of their combined impact on mobility transformation.

5. Conclusions and avenues for future research

This research has comparatively assessed how SUMPs integrate justice-oriented principles in eight pilot cities involved in the JUST STREETS project. The primary aim was to evaluate the extent to which justice (particularly distributional and procedural dimensions) is embedded in urban mobility strategies. The secondary objective was to identify critical gaps and opportunities related to the promotion of active mobility. In doing so, a qualitative comparative framework was applied which is structured around two analytical dimensions: the prioritisation of active mobility and the examination of fairness in the allocation of infrastructure and participatory planning processes.

The analysis revealed substantial variation in how cities operationalise justice within their SUMPs. For example, cities with explicit commitments to spatial equity and public health goals (e.g., Braga, Kozani, and Vilnius) tend to prioritise inclusive infrastructure and broader integration. By contrast, Amsterdam and the Metropolitan City of Milan focus more heavily on modal shift especially toward cycling which sometimes at the expense of pedestrian infrastructure. Across all cases, making a balancing between pedestrian and cycling investments as well as responsiveness to local social needs remain as key challenges to build genuinely sustainable mobility systems.

Participatory planning plays a key role in enhancing legitimacy, adaptability, and inclusivity. Amsterdam, Cugir, and Vilnius demonstrate iterative and responsive approaches, while Braga and Kozani link engagement directly to strategic long-term planning. Meanwhile, in the Metropolitan City of Milan, Riga, and Westminster, participation is more deeply institutionalised, although its scope and inclusiveness vary significantly. These differences reflect broader contrasts due to diverse political cultures, administrative capacities, and planning traditions across European cities.

The research also highlighted several methodological and structural limitations. The comparative analysis was constrained by heterogeneity in document structure, inconsistent data availability, and varied levels of detail in policy articulation. This hindered the comparison of the extent of infrastructure distribution, participation, and justice implementation. Justice principles are often referenced normatively but rarely supported by measurable indicators or implementation mechanisms, limiting accountability and evaluation.

In light of these findings, a few policy recommendations emerge. First, cities should incorporate measurable justice indicators in SUMPs—such as spatial movement equity and neighbourhood level modal access—which are often absent or vague (e.g., Amsterdam, Cugir, and the Metropolitan City of Milan). Additionally, mobility data should be standardised and disaggregated particularly for walking which is commonly underreported due to its integration into multimodal trips, as evidenced in Amsterdam.

Modal prioritisation should place walking and cycling at the core of sustainable mobility strategies. For instance, pedestrian infrastructure in Amsterdam remains underdeveloped and unevenly distributed which signaling a need to rebalance investment. Likewise, cities should develop dedicated pedestrian strategies that move beyond treating walking merely as an access mode to public transit while offering a more comprehensive vision for pedestrian mobility. Universal design principles should be systematically applied to ensure accessibility in all active mobility infrastructure. While cities like Kozani and Riga offer promising examples and broader implementation remains limited. Participatory planning processes must evolve from formal consultation to inclusive, meaningful engagement across all social groups. Although efforts by Vilnius, Braga, and Cugir are commendable, more consistent and structurally embedded approaches are needed throughout the region.

Moreover, adaptive governance mechanisms should be established to enable regular updates and responsiveness to evolve urban dynamics. Iterative approaches in cities such as Amsterdam and Vilnius not only demonstrate the value of such flexibility but also represent transferable practices applicable in other urban mobility contexts. Key best practices emerging from this analysis include the balancing of investments between walking and cycling infrastructure, and the institutionalisation of participatory planning that centres marginalised voices. These practices not only align with the core aims of SUMPs but also offer a scalable foundation for embedding justice in mobility transitions. Finally, a comprehensive and integrated SUMP should be developed for Westminster to unify its walking and cycling strategies under a single policy framework. This would enhance coordination of investments, improve equity in spatial allocation, and strengthen the justice orientation of its mobility planning and evaluation processes. Future research should explore how justice can be systematically integrated in local governance systems and strategic planning tools such as SUMPs. While this analysis highlights policy-level commitments to distributional and procedural justice, fair allocation of resources and participatory planning processes do not inherently ensure mobility justice outcomes. The effectiveness of active mobility infrastructure is formed by its usability, safety, accessibility, and responsiveness to diverse street user needs. Although several SUMPs reference inclusive design and support for vulnerable demographics, the extent of implementation remains uneven. Accordingly, further research is required to examine how such mobility planning intentions are realised in practice across social groups.

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